OFFICIAL REPORT

—OF THE—

TENTH FRUIT GROWERS' CONVENTION

—OF THE—

STATE OF CALIFORNIA.

1889.

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OFFICIAL REPORT

OF THE

TENTH FRUIT GROWERS' CONVENTION

OF THE

STATE OF CALIFORNIA,

HELD UNDER THE AUSPICES OF THE STATE BOARD OF HORTICULTURE, AT CHICO, BUTTE COUNTY, COMMENCING TUESDAY, NOVEMBER 20, AND ENDING FRIDAY, NOVEMBER 23, 1888.

EDITED BY THE SECRETARY.

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1889.

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Office of the Board:
No. 220 SUTTER STREET, SAN FRANCISCO.

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OF THE

TENTH STATE FRUIT GROWERS' CONVENTION.

HELD UNDER THE AUSPICES OF THE STATE BOARD OF HORTICULTURE, OF THE STATE OF CALIFORNIA, AT THE CITY OF CHICO, BUTTE COUNTY, COMMENCING TUESDAY, NOVEMBER 20, AND ENDING FRIDAY, NOVEMBER 23, 1888.

Pursuant to notice issued by the State Board of Horticulture, a convention of fruit growers, shippers, packers, nurserymen, and others interested in horticulture and kindred pursuits in California, assembled in convention in Pythian Hall.

OPENING EXERCISES.

The exercises were opened with prayer, by Rev. N. R. Peck, of Penryn.

ORDER OF BUSINESS.

The President announced the order of business to be:

1. The election of two Vice-Presidents.
2. The election of an Assistant Secretary.
3. The election of a Committee on Programme.
4. President's semi-annual address.
5. Address of welcome.

VICE-PRESIDENTS.

Hon. Wm. Johnston, of Richland, Sacramento County, and Mr. Geo. M. Gray, of Chico, Butte County, were, upon motion, elected Vice-Presidents by acclamation.

ASSISTANT SECRETARY.

Mr. Edward J. Wickson, of Berkeley, Alameda County, was unanimously elected Assistant Secretary.

PROGRAMME COMMITTEE.

Hon. S. J. Stabler, of Yuba City, Sutter County, Chairman; Mr. P. W. Butler, of Penryn, Placer County; Mr. G. M. Gray, of Chico, Butte County; Dr. A. F. White, of Santa Rosa, Sonoma County; and Mr. Milton Thomas, of Los Angeles, were appointed the Committee on Programme, and, pending the report of said committee, it was agreed that the subject of "Insect Pests and Remedies Therefor" be considered in the afternoon.

NATIONAL GRANGE.

The following telegram was ordered dispatched to the National Grange, in session at Topeka, Kansas, on motion of Vice-President Johnston:

CHICO, CALIFORNIA, November 20, 1888.

To the National Grange, Topeka, Kansas:

The fruit growers of California, in convention assembled, send you cordial greeting and bid you God speed in your efforts to educate the tillers of the soil and advance their interests, and earnestly invite you to hold your next annual session in California.

GOVERNOR WATERMAN.

The Governor of State was expected to be present at the opening of the convention. Hon. Wm. Johnston explained his absence, stating that it was entirely due to official duties. The following was ordered dispatched to his Excellency:

Hon. R. W. WATERMAN, *Sacramento:*

The fruit growers of California, in convention assembled, desire to express to you their sincere regrets that official duties prevent your attendance with them, and extend to you their thanks for the deep interest you have often expressed in the success of their industry.

Here a recess was taken until two o'clock P. M.

AFTERNOON SESSION.

Hon. S. J. Stabler, Chairman of the Programme Committee, presented the report of said committee, which was adopted.

ADDRESS OF PRESIDENT COOPER.

LADIES AND GENTLEMEN: This will be the tenth fruit growers' convention, and the sixth held under the auspices of the State Board of Horticulture.

At the ninth convention, held in Santa Barbara, ninth to twelfth of April last, I urged very fully the subjects which I deemed of greatest importance to be considered. There have not been any material changes in the fruit-growing interests, so that I refer you to the opening remarks made at that time.

Our last biennial report is now ready for distribution. It comes down to July of this year. Contains, besides the reports of officers, the transactions of the Santa Rosa Convention, held in November, 1887, and the one held in Santa Barbara, April, of this year. We consider this report of great value to all those interested in fruit growing; we also recommend the previous report of 1885 and 1886—to be had on application at our office, 220 Sutter Street, San Francisco.

Before reviewing the last report I make mention that this is the first time in the history of the Board that we have been able to present the work so promptly to the fruit growers. It has been accomplished by the great energy and indefatigable efforts of our Secretary, B. M. Lelong, for which he has the heartfelt thanks of the Board, and will have the thanks of every fruit grower who peruses it.

The report is here for gratuitous distribution, and I trust every member of this convention will avail of the opportunity to procure a copy. Some reference was made in my opening remarks referred to, of the difficulties

the Board had to encounter, and it is pertinent in this place to mention that the appropriation last made for the expenses of the Board, the time between March 31 and June 30, 1887, was overlooked, so that we had no funds for April, May, and June; all expenses incurred during those months remain unpaid. The deficiency should be met by a special appropriation at the next meeting of the Legislature.

We turned back to the State Treasury $2,762 71 of unused funds, and yet by an oversight we could not recover for the expenses during said three months. I refer you to page 17 of that report.

The appropriation is totally inadequate for the demands. I as a member of the Board have been called upon to advance money to procure materials, because parties are unwilling to wait so long to get a warrant, and then submit to a discount to get the cash. A certain sum of money should always be in the hands of the Treasurer for immediate use.

I submit for the action of this convention to adopt some measure asking the Legislature for a larger appropriation, and a different disposal of the funds appropriated.

I recommended on page 161 further consideration of the subject of distribution of fruits. Since that convention there has been organized a Dried Fruit Association to protect the dried fruit interests, as also raisins and nuts. The fullest discussion is invited on this subject.

It is also important that this convention should have the benefit of the result of the auction plan as practiced by the California Fruit Union of sales of shipments of ripe fruit in eastern markets for the last crop.

I visited in July the cold storage warehouse of Mr. Allegretti at West Berkeley, and was well pleased with the apparent success of his system. I am satisfied that it is worthy of our careful consideration.

I recommend that the subject of protection to fruit industry be omitted from our programme at this convention.

INSECT PESTS.

The ravages of the *Icerya purchasi* become more and more alarming. The gas remedy appears to be given up, and, so far as I have been informed, no radical warfare has been made against the pest.

A committee was appointed at our last convention to visit the orchards of Sherman P. Stow, and the Hollister estate, and report to the convention. The report made was not satisfactory to the citizens of Santa Barbara County, and was severely criticized, because it decided nothing.

A gentleman by the name of Steele has been experimenting in the Hollister estate orchard, for some three months or more, with the Ongerth Tree Protector. I have watched the progress very closely, and conclude as follows: That washing the trunks thoroughly with the undiluted mixture will prevent the insects from crawling up the trunk, and that the tree is not injured by the washing. Spraying the top with a solution of four gallons of water to each gallon of the mixture will kill 95 per cent of every insect that it touches. It is manifest that vigorous work, such as is being done by Mr. Steele, will clean the orchard to such an extent that keeping the pest in subjection will not be a serious matter.

Mr. Steele has a steam apparatus with which he can work four to six sprayers at the same time, and is now engaged in cleaning the orchard at a fixed price per tree, and proposes to go from orchard to orchard and complete the work, so long as he is encouraged by the owners.

PARIS EXPOSITION.

The United States Department of Agriculture, Division of Pomology, are soliciting coöperation of the fruit growers, to prepare a display of fruits for the Paris Exposition of 1889. Should the convention desire to take any action regarding this request it will be in order to do so. I therefore recommend that the subject form a part of our programme.

OLIVE CULTURE.

No fruit in California at the present time claims so much attention as the olive. A great deal has been written. Conflicting reports have created an inquiry that cannot be satisfied, there being no experience to ratify statements made.

There appeared in the San Francisco "Call," of June seventh last, an article by an Italian gentleman, Carlo Dondero, in which the statement was made that the oil I produce could only be rated second or third quality; that berries could not be dried by artificial heat, without injury to the flavor; that the seeds could not be crushed without producing an inferior oil; that the Mission olive makes an inferior pickle; that while it produces only 10 to 12 per cent of oil, they have varieties in Italy that produce 35 to 45 per cent; that scale insects here threaten even the possibility of success, while in Italy the experienced olive grower got rid long ago of these pests by simple and cheap remedies.

I called the attention of the Board to these statements at our last meeting, July second. I was requested and instructed by the Board to communicate with the gentleman, and have brought from Italy a sample of the superior berries referred to, as well as the superior oil, at the expense of the Board, and have them at this convention for examination.

In order that they should arrive on time, I fixed the date of picking the fifteenth of October, at which time I picked some of the Mission variety, with two other varieties now here to be compared. I also wrote to others to pick olives on that date, and have them present.

Mr. Dondero also assented to my request to write an essay on the olive.

Arthur Tappan Marvin, of San Francisco, has compiled quite an elaborate work, principally translations from Italian books, recently on sale, in which certain statements are made, that may or may not be true, there being no experimental fact to determine. At any rate, what has been said about the *Picholine* being nearly allied to the wild olive, and comparatively worthless, has created alarm amongst the growers.

This variety has been planted by the thousands. It is important and necessary that we should investigate these statements, so as to prevent the planting of new orchards of worthless varieties, or should the publications have no foundation in fact, then to allay the alarm created by them.

If there are varieties in Europe so greatly superior to the Mission, we should make every effort to get them for general cultivation in California.

FOREST CULTURE.

I again urge that we ought to encourage forest tree planting for the protection of our fruit trees.

Our fruit industry is rapidly increasing from year to year. Our fruits are sought by the people in almost every part of the country; we have a growing demand with an increased interest in our products.

Shall we keep pace in our efforts so as to profit by it? We should give our greatest energies to improve our methods by producing better varieties—take greater pains in picking, packing, and drying, and put on the market in perfect condition at reasonable prices.

Proper distribution will be the greatest obstacle to our success. We must not relax our efforts in educating the people, in insisting upon transportation facilities, and in doing everything that will harmonize our efforts for our success.

All personal prejudices should be overcome by that which is more important, universal good.

With these few remarks, ladies and gentlemen of this convention, I submit these questions for your consideration.

ADDRESS OF WELCOME.

Delivered by Rev. E. Graham, of Chico

Ladies and Gentlemen: The old play-writers were accustomed before producing the substance of their play, to construct what they called a prologue; that is, something by which the general nature and character of the play which was to follow might be determined.

The distinguished gentleman who was to address you this morning, General Bidwell, has delegated to me the position of speaking the prologue of what is subsequently to follow. I, however, must cast myself upon my Yankee tendency to guess somewhat as to what shall be the nature and character of the play you are to perform, for I am no horticulturist myself, as you know from the official designation by which I have been introduced, still I have had the pleasure of reading the admirable biennial reports which you have issued, to which reference has been made in the address of your President, and from them I gather something of the general aims of your meeting.

I take it for granted that you are those that were spoken of by a very talented literary gentleman (Carlyle) as those who "cause to grow one blade of grass where a blade of grass never grew before," and that each of you is therefore "of more value to the world than fifty warriors."

This indicates, I think, the character of your avocation. You are not accustomed to the roar and rattle of machinery, nor to the clash of arms, nor to those peculiar antagonisms that arise sometimes out of commercial and political affairs, but you walk in the quiet vales of Agriculture, you live in the sunlight, you listen to the hum of the bee and the voice of the warblers of the forest, you study those things that lead you upwards, following the trailing vine as it climbs upward to the skies, and there is only one step, it seems to me, between your vocation and Paradise itself, a very short one to the garden wherein all flowers ever grow and wherein luscious fruits are always picked.

Now I think it is very proper that *we*, here in Butte County, should give you a most hearty greeting, for we are *par excellence* horticulturists and agriculturists, and we flatter ourselves that however distinguished you may be personally or as an association, we are in such a position as to give you a hearty and universal welcome.

I have not the slightest doubt but that you all represent the "garden spots of California;" each one of you lives in the finest climate and in the very best part of California. Well, let me assure you that you have not traveled beyond that boundary; that you may feel perfectly at home while you are within old Butte, for we too claim that we are in the "garden spot of California." It is true that we cannot boast very much of our sunshine this morning, but this is you know "*exceptional in our district.*" I have not the slightest doubt but what you have also had to make apology for your sections sometimes in having rain when you have expected and desired sunshine. I can assure you, however, that we have sunshine *in all its glory;* indeed, I am reminded of the fact that one of the most distinguished horticulturists of our State, Judge Talbot, of Tulare, describes that belt of land which stretches from Red Bluff on the north to Bakersfield in the south as being the "*sunshine belt of California*," having the distinguished eminence of being "above the fog belt and below the cloud belt," indicating that it is really the home of the fig, of the pomegranate, and of the orange, which you can see here represented to-day. We therefore say this downpour is exceptional; at the same time, you, no doubt, understand how we also appreciate the abundant rains, which, with the sunlight, make up the glory of the land, bringing to us the fruits and flowers in which we so much delight. You can therefore pardon us for giving you a drenching to-day.

In other lines also, I think we have, if not the preëminence, very near the preëminence; we can show you "big things" up here in Butte. I have not had the opportunity to get correct statistics as to our area or productions, but I venture the assertion that Butte will compare favorably with your most extensive areas and most varied productions. We have what, perhaps, might be called the "biggest farm in the world," at least a very distinguished Scotch gentleman, who called on me the other day, gave me the assurance that he had the opportunity of examining into horticulture and agriculture all the world over, and he gave us in Butte County the preeminent distinction of having "the largest detail thoroughly cultivated farm in the world;" there may be modifications, of course, in some sense. We have also, as Sir Joseph Hooker has said, the biggest oak in the world, and he, I venture to say, is an authority upon that subject. We, I think, can present you with one of the biggest cherry trees in the State of California, if not in the world, and I think, perhaps, we can show you also the largest grain farm in the world, within the boundaries of Butte County; at least, we have only to step across the border and beguile ourselves with the belief that we are still in Butte County, and assure you of the fact that we have the largest grain farm in the world.

We have a great many things that are beautiful. I would, however, we could this morning present to you one of the biggest things we boast of, one of the largest hearts in the world, that would give you a welcome such as I never could speak.

He is a virtual production of Butte County, and we are as proud of him in Butte as Santa Barbara County is of your distinguished President, and Sonoma is of her pioneer hero, General Vallejo, whom we are proud to greet here to-day.

Our honored citizen is absent, as has been referred to by the President of the convention, or from the fullness of that big heart, I am sure you would have such a welcome as would gladden you, and give you to understand that if we are not the biggest in everything, we are at least the biggest in appreciation and hospitality.

I cannot, of course, inform you very correctly of the varied industries of the county, but I will take it for granted that you have eyes such as will search out for yourselves its capabilities, and by which you will be assured that you have come to a place that none of you can afford to despise, and that you perhaps would like to understand more thoroughly. You will find too, after your examination, that this is the spot of all others that comes up to the famous saying that "if you tickle the ground with a hoe it will laugh a harvest." We can assure you that there is nothing that is worth producing either in agriculture or horticulture that cannot in a measure, and in most cases to perfection, be produced in Butte County, and the difficulty indeed is, to select, in the whole scope of horticulture, anything that will not grow in Butte County.

And we can also assure you that we do not require the abundance of irrigation that is required in some counties that are represented here, giving us, I think, a special prominence in the matter of horticulture and agriculture, reducing the price of the production of our cereals and fruit, and commending itself to every horticulturist as the very home of fruits and flowers. But to come to a special point, I have no doubt at all that I am expected to represent to-day something that I cannot fully express, and that is the great desire on the part of our people that you should feel entirely at home among our citizens—among the people of Butte County.

My embarrassment results not simply because you are a distinguished class of people, an honorable class of people individually, but because you represent to such a high degree the great qualities and conditions of life in which we live. If I should attempt to express the sentiment which is before your mind to-day, and deep down in the hearts of our people, I should say to you truly that *every latch-string of old Butte is at the portal*, every door is open, and every heart brings its gladdest welcome to make you feel at home while you are with us. I should say also, that all things seem to combine to increase our gladness and swell our welcome. Those flowers around us bloom for you to-day. The orchards are dropping upon you their richest fruits, the vineyards are pouring out their vintages, the very "trees of the field are clapping their hands," and the benedictions of all hearts, I trust, will rest upon you and linger with you when you go from us, until you again return to gladden us, and receive the most abundant welcome that we can possibly confer.

INSECT PESTS.

Essay by H. P. Stabler, Yuba City.

Fruit culture in California is now assuming vast proportions and every department is being thoroughly worked up by energetic men. The Fruit Union has proven itself eminently successful and insures a market for the California fruit grower in the East for an almost unlimited output of green fruit. The Dried Fruit Association will doubtless do the same for him for his dried fruit. The success of these two enterprises at once puts the fruit business in this State on a sound basis commercially, and no doubt will be the cause of many engaging in the business in the near future.

But there are yet serious hinderances to the ultimate success of the business, which, if not overcome and counteracted, will in a great measure

reduce the profits and may seriously cripple what now promises to rank with the most prominent industries of the State. Undoubtedly the greatest threatened drawback to the success of the fruit interests of the State is the prevalence of depredating insects on both tree and vine.

Nearly every branch of industry is afflicted by injurious insects. Earth, air, and the sea swarm with them. All crops throughout the country are more or less injured by them, and many are entirely ruined by their depredations. Cotton and tobacco in the South; potatoes and corn in the West; and wheat and rye in the North, have often been rendered entirely profitless by their devastation; but it is the fruit grower of California who suffers most from the depredations of pests. The tree in the nursery, the tree as it grows in the orchard, the fruit on the tree, and the fruit after it is dried, is often infested with pestiferous insects.

Our climate—so mild and equable—is wonderfully favorable to the propagation and dissemination of insect pests. While almost every known horticultural product of the world will grow and flourish in some part of California, the pests that infests it, owing doubtless to the salubrity of the climate, will also multiply and spread to an incalculable extent. Not only have we to contend with almost every pest that is congenial to other climes, but with some species that only exist to a considerable extent in this State.

Many of our enterprising citizens who have imported trees, plants, and scions from foreign countries are doubtless responsible for the introduction and subsequent spread of some of our worst pests; but however it happened, we know that the pests are here, and it looks as though their eradication was going to be a difficult problem to solve.

The orange growers of the southern part of the State are unpleasantly familiar with the cottony cushion scale, the peach and prune growers of upper California have been forced into a reluctant acquaintance with the pernicious scale, and the apple and pear growers are sorely troubled with codlin moth and woolly aphis. The ravages of pests in this State alone annually amounts to tens of thousands of dollars, and unless effective laws are enacted by our Legislature and stringent measures adopted and followed by ourselves, the loss will certainly increase at a fearful ratio.

I am not prepared to say that the present laws on the subject are not sufficient for the purpose designed, but if they are wanting in any essential particular, they should be speedily amended and made to conform to the necessities of the case. It does not seem to be so much the deficiency of the laws applicable to the matter in hand, as the non-compliance with them by interested parties.

From the fact that pests spread from orchard to orchard, through some process not well understood, thus rendering the thorough and scientific spraying and disinfecting of one man useless, unless his neighbors adopt the same course, the most stringent and binding methods should be adopted and inflexibly pursued, to contest every inch of progress made or threatened by pests.

The inventive genius of the American people has placed in the hands of the modern horticulturist adequate and efficient appliances for the destruction of these insidious enemies. The law has also wisely provided for an officer, whose duty it is to examine orchards, experiment with the nature and habits of insect pests; to ascertain, invent, and promulgate remedies and outline the best methods of their application for the destruction of the pests; to import known parasites if possible, and generally to assist in every possible manner to attain the end desired. Such an officer now exists, and is believed to be worthy and competent. He is doing his duty in a careful, laborious, and painstaking manner. All else to be done remains with the

fruit growers. They should organize, in every fruit-growing section of the State, horticultural societies. Every fruit grower, however small his possessions may be, should become a member, and every member should regularly attend the meetings. The local Inspector of Fruit Pests and Quarantine Guardian should have at all times the full and vigorous moral support of every member.

It is notorious that in many fruit-growing sections of the State some orchardists annually expend much time and money in spraying, cleansing, and pursuing other well known modes in exterminating pests, while adjoining owners neglect their orchards, knowing them to be infested, thereby affording a hotbed and breeding place for the worst of pests. Vigorous and well directed efforts, and a thorough and efficient concert of action, seems to be what is needed. Efficient remedies are known to the skilled pomologist, and can be ascertained and procured by every one. They should always be applied at the full standard of strength, and in the most thorough and exhaustive manner, and by every one who has an infested tree. A community can be infested from one tree planted in a houseyard, and it is highly important that every fruit grower should be well versed in the time of application. When the insect is in its incipient state it is much more easily killed than when it approaches maturity and takes on its defensive armor.

Every infested tree should be repeatedly and thoroughly cleansed at the proper time, and in default thereof immediately removed and destroyed. From a limited experience I am convinced that apathy on the part of the fruit growers of California is the best friend that the insect pest has as yet found. Persons who have but a few fruit trees for family use seem to be the most careless in respect to their condition. They obtain their income from some business, other than fruit growing, and therefore give their trees little or no attention. Of course it would not pay the latter class of persons to purchase and keep in order a full complement of appliances for the destruction of pests, or to learn from others versed in the matter the most approved remedies for that purpose, but the fact still exists that the dissemination of these little enemies to the orchard, comes largely from the foul trees of the small grower; therefore, it should be obligatory on the part of such owners, to either keep their trees in a healthy state, or else remove them. Almost any progressive orchardist would apply the remedies for a nominal consideration, his main benefit accruing from the fact of the destruction of the pests.

This should be brought about and rendered compulsory by stringent statutory enactments, or by a strong public opinion, or by the watchful care and persistent importunity of local societies of intelligent pomologists, or by all of these agencies.

Many of the intelligent, experienced, and progressive California orchardists seem to be derelict in contending against the spread of injurious insects. They do not vouchsafe to the subject the importance it deserves. They do not realize that unless prompt and vigorous preventive measures are pursued their property is constantly deteriorating. It is not enough to wait until the enemy appears and appreciable damage is done, before action is taken. A preventive is always better than a cure. The orchardist should be untiring in his warfare. He should disinfect and spray upon knowing the threatened danger, and that too with the same regularity that he prunes and cultivates, regardless of labor, and almost regardless of expense.

The continuous and necessary custom of transporting scions and nursery trees to and from all parts of the country, of itself foreshadows the danger,

and the unwritten history of scores of dilapidated and ruined orchards in many parts of the State fully demonstrate it.

The frequent and instructive meetings of this and other similar organizations, attended by fruit growers, bring home to their minds a full and ample knowledge of remedies, and they should be applied with alacrity. The cost is inconsiderable compared with the benefit.

I believe that with a unity of action and with a wholesome individual energy on the part of the fruit producers, the prevalence of injurious insects in California will be materially lessened, and they may be exterminated.

INJURIOUS INSECTS.

Essay by W. G. KLEE, Glenwood.

CALIFORNIA PEACH ROOT BORER.

My attention was first called to this insect by Mr. J. Britton of San José, who in May last sent me specimens of the insect in its various stages, but in such condition that the exact species could not be identified. Enough, however, could be seen from which to conclude that it was a near ally of the pernicious *Eastern peach root borer, Sannania (Aejeria) exitiosa.* In Mr. Britton's company I visited shortly afterwards the infested region, which lies about two miles and a half southwest of San José, where I obtained some specimens of the larva and chrysalids. Not satisfied with my result I again visited the place in company with Mr. Albert Keobele, and Mr. H. A. Brainard, editor of the "Santa Clara Valley." We spent the greater part of the day on the place of Mr. Leigh, southwest of San José, and obtained a number of specimens of both *larva* and *chrysalids.* These we readily found by removing the soil from around the base of the tree, laying bare the bark for several inches. Gummy exudations indicated the presence of the borer and with a knife it was easily extracted. This borer works directly under the bark, feeding on the cambium layer. Its tunnels, which are more or less vertical, vary from four to eight inches in depth, and from two to four inches in width. The larva has a great appetite, yet on account of its habit of working downward, the tree is not as quickly girdled as when the *Eastern peach root borer* is at work. Frequently three or four borers were found at work, and still the tree apparently not suffering severely.

A tree badly attacked by this borer commences to look yellow, the fruit generally commences to enlarge, and often, after a hot spell of weather, commences to wilt; however, if only a portion of the bark is girdled, it may show no signs. To ascertain the presence of the borer the soil must be removed, as it works invariably underground.

With the exception of two cherry trees, we found only peach roots affected, but anything on this root is plainly liable to its attack. It seems, however, that greatest danger of infection exists on lands of a heavy nature. In fact, in going over several acres of this character we obtained mostly all of our specimens, while hardly any were found on sandy soil adjoining. In this respect our observations agreed with Mr. Leigh's experience, who confidently asserted that these insects had been observed by him for ten years.

If plum root is or is not attacked, we have not been able to prove conclusively, as we did not see but very few trees as plum root in the immediate neighborhood, but there is strong probability that both *plum* and *apricot* are resistant. This matter requires thorough investigation, and I intend to try the experiment of colonizing the borer on plum root. The grub or larva is pinkish when alive; the chrysalid is brown, sperm of the eatings and borings of the wood. When emerging from its chrysalis state, the moth reaches the surface, and its last skin is often seen protruding.

DEVELOPMENT.

This species requires evidently a year for its full development, and as the moth appears in May and June, the egg must be laid in that time. These are laid just below the surface, and the reason that so few worms are found on sandy soil, is probably because in ovipositing the female has to push the abdomen in the ground; when it finds that the soil falls in, its instinct leads it to avoid such places.

REMEDY.

Planting in sandy soil or replacing the natural soil with a basin of fine sand, will probably prove a very good preventive of infection. The sand should be placed at least to the depth of four inches. A method recommended in the East for the peach borer found there, is the wrapping of a stout piece of paper around the trunk to the depth of six inches, and two above, this to be held in place by a collar of mortar. *Gaslime*, which has been recommended for this purpose, is too dangerous; while it might do no harm during the summer it would invariably result in danger to the tree, if thoroughly wetted and the solution was percolating down the trunk. Indeed, I have already learned of damage from its use. In my recommendation of using *gaslime* for woolly aphis on the apple tree, I have invariably warned against putting it against the trunk. In this case the material to be successfully used must be placed against the trunk. *Air-slacked lime*, however, may be used without any injury, but should be put on in the spring, after the heavy rains are over; in the early part of April.

It being a settled fact that this insect is new to science (named by Professor Riley, *Sannania pacifica*), we must look for its original food plants in this State. I have spent a little time in looking over the creeks adjoining the infested district, but have failed to find any wild trees infested, but I shall continue this investigation further next spring, as it is of considerable importance to know the wild tree this borer inhabits. My conclusion is that it probably lives on one of our wild cherries (perhaps *Prunus demissa*), but owing to the fact that the soil generally is sandy along watercourses, and the trees of a kind are few and far between, the food for the borer has been restricted, so that very little increase took place until orchard planting commenced in the vicinity.

There is no question that the insect may be spread on nursery stock. The eggs being laid in the bark, and the trees coming from suspected quarters should be thoroughly scrutinized, and at least thoroughly disinfected by dipping in caustic solution. So far I have only found this insect in the locality mentioned, two and one half miles southwest of San José, but being a native insect we may look for it in all the orchards along watercourses in the coast valley.

The mature insects, male and female, are distinguished from the eastern species by the absence of cross bands of the abdomen, which are of a black steel blue.

BROWN APRICOT SCALE.

Another insect which has forced itself to the attention of fruit growers in certain counties is a large brown soft scale, yet unnamed, a species of Lecanium, which I propose to call, popularly, the *brown apricot scale*, because it is one of the few scales troubling this tree. It, however, also infests many other kinds of trees, especially prunes, peaches, and pears. The young appear from the eggs in May or June, and scatter all over the trees, settling on the leaves, which become viscid and soon covered with black smut. The whole tree suffers severely by the pores being clogged up, resulting in small and inferior fruit. So small and transparent is the young scale that it is hardly perceptible on the leaves, except through a magnifying glass. They gradually increase in size, however, but not very materially before the following spring, when with the rise of the sap their growth is enormous, their soft, sticky bodies covering the branches completely. When detached from the branches the numerous oval eggs are seen surrounded with a white mealy powder. The young hatch in comparatively short time, and there is only one brood in the season, other statements to the contrary. The insect has spread rapidly in the prune districts of Santa Clara County, and I have also seen it in Alameda County, although much less dangerous than the pernicious scale. It is very troublesome to exterminate, and its appearance in an orchard should cause thorough measures to be taken. This scale is evidently a native of the State, having been found on oak trees, from which it spread, and has proved itself well adapted to our fruit trees.

REMEDY.

This scale is hard to kill when most conspicuous in the spring; it is then protected and the tree too tender to use strong remedies; it must be fought either before or after this. In the winter it can be killed with remedies, half the strength of which is necessary to kill the pernicious scale. A solution of one fourth pound of potash, one half pound of soda lye to four gallons of water, to which one fourth pound of whale oil soap has been added to each gallon of the solution. A strong solution of whale oil soap of one half pound added to one gallon of water will also suffice, but most thorough work is necessary, used early in the season immediately after the fruit has been harvested. The following summer wash previously recommended is of good service: One and one half pounds of sulphur, one pound of American concentrated lye or four fifths of a pound of powdered caustic soda, ten pounds of best whale oil soap (80 per cent). Dissolve the lye in one gallon of water; boil the sulphur until dissolved; dissolve the soap in water; mix the two, and boil them for a short time; use at 130 degrees Fahrenheit in vessel.

CODLIN MOTH.

The past season, unlike the previous one, proved exceedingly favorable to the propagation of this pest; and more wormy fruit appears this season than, perhaps, any previous one. The remedies for the moth have also proved less effective; and in many instances spraying with arsenites proved altogether ineffective. In most cases—except with early fruit only—one spraying has done no good whatsoever. The reason of this is obviously due to the wet weather in the early part of the summer, which removed the arsenic and left the fruit unprotected. When two sprayings have been made, especially after the rains, the good effect has been plain.

In my own experiments in the Santa Cruz Mountains, I found that all early apples, and also Bellflowers, were pretty free, from five to ten per cent of the latter only being affected. The damage done to the trees by spraying (strength one pound to one hundred and eighty gallons) was again, as last year, quite severe, and the same circumstance presented itself as last year—that trees in position to dry out quickly after damp nights suffered but very little, showing conclusively that the damage was due to the arsenic being leached out by the moisture during the night. My statement made last year—that the strength of the solution endured by different varieties varies considerably—is again supported by experience elsewhere, particularly in the case of Bellflowers; this may, perhaps, be solely due to their dense foliage. While the Bellflowers with me were pretty clean, it was not the case with E. Spitzenburg, which proved itself very badly infested. As these two apples—Bellflower and Spitzenburg—were harvested but a short time apart, and were almost of the same degree of ripeness, the difference must be sought in other causes. The reason in this case was, evidently, that, with the Spitzenburg and Yellow Newtown Pippin, but especially the first, there was a distinct second blooming some three weeks after the first, which did not receive any spraying, as there was only one spraying done. Thus blossoms which were small and not conspicuous, moths made the most of, and the apples were so badly affected that they never reached any size; and, although many were picked off, a great many fell between the vines growing among the trees, and were lost sight of. This proves conclusively the necessity of picking off such secondary blossoms.

In this connection I would call attention to the importance, in early regions, such as the Sacramento Valley, to not allow a second crop, by growing early varieties; and observing this closely it has been the experience of such men as Mr. Sol. Runyon, that codlin moths will do comparatively little damage. But while my own experience has not been as encouraging as it might be, other people who have partly followed my advice have succeeded very well. Mr. W. W. Riser, of Centerville, Alameda County, used *London purple*. He reports his early apples, such as Astrachan and Alexander, free from worms; fall apples, when sprayed only once, badly infested, as well as winter apples, when only one treatment was given. But when two treatments were given, the last in the beginning of July, at a strength of one pound to two hundred and twenty-five gallons, the improvement was great, resulting in having at least 50 per cent of clean apples, against only 10 when not treated. Whether I can safely recommend so late a spraying may be doubtful, yet when the apple has several months to grow in, the danger of poisoning from eating is gradually lessened, especially as it has been proven that the arsenic is gradually leached out of the compound. In *Coloma, El Dorado County*, a widely different section and climate from *Alameda County*, it seems that one spraying accomplishes as much as two with Mr. Riser, probably owing to the absence of rain and dew. Under date of October fifteenth, Mr. A. J. Mahler writes: "*We have used the mixture of Paris green, one pound to one hundred and sixty gallons of water, for codlin moth; we gave the trees only one spraying, on April eighteenth, and the result is that we have saved at least 50 per cent of the apples treated. The apples that have been treated are large and of excellent color, and the trees show no damage from the poison.*"

Mr. C. T. Settle, of San José, has obtained the best results of any. Although surrounded with badly infested orchards, he has succeeded in saving 75 per cent of a very large crop of late apples—*Yellow Newtown Pippin* and *White Winter Pearmain*, but it was done with no less than four

sprayings with Paris green. The foliage was but little damaged when I saw them in August last. In answer to a letter addressed to Mr. Settle on this point, he writes under date of November thirteenth: "*I washed my apples four times with Paris green, using ten ounces of the latter to one hundred gallons of water, commencing when the apples were very small and washing about every twenty-five days, and saved 75 per cent of the apples that were on the trees at picking time. I also used bands, removing these every eight or ten days.*"

KNOTS ON ROOTS OF FRUIT TREES.

Last month my attention was called to the condition of a large number of plum trees in a young orchard near Mountain View. Subsequently I visited the place and found that something like one fourth of the trees were affected. These knots were found below ground on the junction with the stock or on the *myrobolan* root itself, on which root all of the trees were growing. All of the trees affected in this manner are comparatively smaller. That these knots are the result of fungoid growth, allied to the black knot, I am quite confident, and the probability is, that the disease is being propagated on the cuttings from which these trees, which served as stock, were grafted. This is an additional argument against using cuttings of the *myrobolan* stock, another being that the root system formed by them is often defective. Similar excrescences are found on peach and pear root, and have been sent me from different parts of the State. Young trees affected by them should be avoided, as under certain conditions they will result in the death of trees. Such knots should, however, not be confounded with those sometimes produced by the tying material of a bud or graft being left in by accident. For trees affected with these knots, I have recommended the complete removal, if possible, by cutting close into their point of attachment. If this is not possible without serious injury, the roots of the trees had better be destroyed. When the knots have been removed, the cuts should be washed over with a very strong solution of bluestone, or better still, if the following mixture be put on it: Two pounds of rosin; one pound of beeswax; one pint of spirits of turpentine; and one fourth ounce of carbolic acid. Melt the rosin and wax by heat; when dissolved add the turpentine and acid, previously dissolved in a little alcohol or hot water.

DISCUSSION.

Dr. A. F. White, of Santa Rosa: In order to elicit discussion on this subject I desire to inquire whether any gentleman here knows of a single county or district in this State in which the white scale had a firm settlement in the orchards from which by any means it has been thoroughly eradicated.

Dr. Kimball, of Alameda: My impression is with the limited knowledge I possess, which may be more or less extensive than others, as I have traveled to some extent over the whole State, I believe I shall have to answer the question in the negative. There is not one place that is absolutely free from it or where its ravages have been very materially checked. I am sorry to make such an answer, but that is the result of my information.

Mr. Block, of Santa Clara: Mr. Lelong, our Secretary, told me yesterday that he had a letter giving very encouraging reports as to the result of work; I would like to have the letter laid before the convention.

The Secretary read the following letter:

TUSTIN, CAL., November 12, 1888.

B. M. LELONG, *Secretary State Board of Horticulture:*

DEAR SIR: Almost every one of the citrus growers are spraying their trees with a rosin wash that was discovered here. It is eight pounds caustic soda, two quarts whale oil, and fifteen pounds rosin, prepared as follows: The caustic soda, rosin, and whale oil are boiled together in about ten gallons of water, for about three or four hours, and then water is added to make one hundred gallons of solution, and sprayed as usual. This remedy kills almost every "red scale" it touches and all "black scale." It is the most successful wash that has ever been used. It does not hurt the most tender shoots or bloom in the least. I have great faith now in citrus culture, and almost anywhere, even with the white scale (which we have not got) but has been killed with this wash in other sections. There are as many as ten spray tanks now in use in this vicinity. They are worked all the time. The main thing is to cook it well, so it will mix through and through. It must be applied warm.

Yours very truly,

H. K. SNOW

DR. KIMBALL: I will inquire whether or not it is a fact that citrus culture that that gentleman speaks of is becoming extinct from the ravages of the red scale alone, to say nothing about the white scale?

MR. FRANK KIMBALL, of National City: In the Santa Ana Valley last Sunday, I noticed quite a number of orchards, some of them that were badly infested with the red scale had been cut off to mere hitching posts; every limb cut off to within a few feet of the ground and the trunks white-washed. Some of the orchards were entirely neglected and been abandoned as dead, while within half a mile of such places there were orchards finely growing, and as far as you could see, entirely free from the pests, as vigorous and fine as any I have ever seen. In San Diego County, perhaps, in answer to the gentleman to my left (Dr. White), two years ago the grounds around the house of the late Wallace Leach, in the City of San Diego, became thoroughly infested with the cottony cushion scale so badly that you could not see the limbs. I discovered it, and reported it to the press, and it was immediately taken up by the orchardists in that county, and we went there in a body to operate on the trees. Mr. Leach met us with a shotgun, and said if a man touched a tree he was a nonenity; finally, he was prevailed upon to wash the trees continuously, and I do not believe there is a cottony cushion scale in the county to-day; if there is I do not know of it. There are some red scale and some red spider, though I know of but few places where they exist, but I have never found any difficulty with the ordinary whale oil soap wash in destroying either the red spider or the red scale. That wash I have prepared myself from the soap made by the Los Angeles Soap Company; I have used it from three quarters of a pound to a pound per gallon, and applied as nearly boiling hot as I could take it from the tank, and sprayed it with the ordinary spray pipe. I have met with great success on the ordinary spider and the black scale. I take from thirty-six to forty pounds of whale oil soap, of Los Angeles manufacture, and put it in ten gallons of water and boil it—this cooks better than in a larger quantity—then I add in the cauldron water, so as to make the whole forty gallons. The reason I make the difference between thirty and forty pounds, is if the scale is very young, thirty pounds to forty gallons of water would be as effective as the forty, and less offensive, taking it from the cauldron boiling hot and applying it through the ordinary spray pump.

DR. WHITE: How long since this extermination occurred that you referred to?

MR. KIMBALL: That was more than eighteen months ago. I have not seen a recurrence of it at any point. It was imported there on some plants, brought from some other section of the country. I think it was on some roses, brought from San José.

DR. WHITE: I have only this to say in regard to the white scale: It has been before this assembly often. We have had various remedies, many of them efficient in killing the scale, for it is not difficult to kill. The great trouble is its wondrous cunning and its habits. It multiplies three times every summer, and is armed with a lance-like beak that will penetrate any poison you may cover the tree with, and draw its nutriment from the inner bark, so that it is difficult to kill, unless you can find something that when it touches the body of the insect will kill it.

MILTON THOMAS, of Los Angeles: The white scale was brought into Los Angeles on some orange trees from Australia. They first appeared on a place that was at that time a fine orchard of deciduous and citrus fruits. As time passed on the scale took possession of the orange trees, and they were grubbed up. There were pepper trees, apple, peach, plum, and, in fact, all kinds of deciduous fruit trees in the orchard; but in less than a year after the orange trees were taken up the white scale disappeared, and those deciduous trees stand there to-day uninjured. I have an orchard of one hundred and twenty acres of deciduous trees, and I am willing that a man may take a peck, or any amount, and put them in that orchard, my faith is so strong; and I think I know something in reference to bugs on deciduous trees. While I am on the floor I want to say, in reference to the letter just read, that Mr. Snow is a man who stands high as a man of the strictest integrity and veracity, and what he said you can take for granted it is true.

MR. WHITE: I will ask Mr. Thomas whether the orange trees in and about Los Angeles are in a thrifty condition, or whether the scale has injured them?

MR. THOMAS: I will say that in the City of Los Angeles, as a great many people know, it has been cut up into lots and sold and houses built on a great many orchards, and those orchards were abandoned and the scale has taken possession. I have a large place inside of the city; an orange orchard. I do not think that there is a scale on it and orchards adjacent to the city. You get out a little distance to the south and there is no scale to my knowledge, but inside of the city the scale has ruined the trees because people have abandoned them and cut their property into building lots.

MR. WHITE: Please state what you know of the scale about Pasadena?

MR. THOMAS: Pasadena is the same as Los Angeles. Immediately around Pasadena, as you are well aware, it has been cut up into town lots and houses built on them, and orchards abandoned, and where those orchards have been abandoned they have not been irrigated, and the trees have latterly been destroyed, and there is scale on those trees; but when you get out a mile or two I think there is none.

MR. I. A. WILCOX, of Santa Clara: I think we can better employ our time in discussing what we can best do in keeping them under subjection than in trying to destroy all of them. Now as to the white scale, I have seen it in the Wolfskill orchard, and I can readily understand that you can kill most of them, but not get them all. That is the case with the pernicious scale. I am inclined to think that where the climate is warm it will do better than with us. Now I am not looking for any new remedies. I am using for this pernicious scale what we have had for a long time, and it keeps it down. I sold some pears last year from an orchard six or eight years old, and I do not think you can see a single one showing there was a scale, and I washed those trees every year since I started, for the scale. I used the common wash, the sal soda with whale oil; that is all I have used for three years, and it is the cheapest wash. We must not give up fighting the scale; we live in a climate where insects have the best show of life, and

we must teach the people of this State when we get home, that the success of fruit business depends upon persistent efforts, using the remedies that are offered.

Dr. Kimball: I remember the good book tells us about the men who went to spy out the land and who brought back a great account of it, that the men were large, the cities had high walls, and the warriors were valiant, and they thought the best thing that the children of Israel could do would be to turn back and wander around in the wilderness; but there were two men that gave a different report; they were fearless men and they concluded to go forward and they went forward to occupy the land, and history tells us what has been the fortune of that country and of the men. I apprehend that my friend lacks a little of the faith, a little of the hope and spirit of perseverance that I believe fills the hearts of all of our fruit growers—when we come to consider the obstacles that we have to meet. I believe that the experience of mankind teaches us that there are no obstacles so great but what persistent united effort will successfully banish. I believe that it only requires a persistent united effort to keep these insects in check, and that there is no variety of insect pests that now overrun our State but that if people will use the information that they now have, persistently—not one man here and another there, but every one, small orchardists as well as large, that before long these insects will disappear. Nature seems to work in a period of cycles; in 1853 I was in the island of Mauritius in the Indian Ocean; there they were extensively engaged in the raising of sugar, one of the most productive islands on the face of the globe; there was there at that time, an insect which resembled this *Icerya purchasi*, and it filled the planters of that island with gloom. It permeated every plantation from the sea to the mountain; but still the people had faith, and in time, by united efforts of their own they kept on and the cycle came around when that insect has entirely disappeared there; I was talking with a Catholic priest who had lived there many years and he said it had become perfectly innocuous, that it did not produce any more trouble among the planters; and this scale that we have here, this *Icerya purchasi*, resembles it very much; from my memory of it they were entirely similar, but I am informed that Professor Riley says that there is a difference, that one is smooth and the other is fluted, but they were apparently of the same nature.

I believe that there is something to be hoped for from this parasite of the scale which is being imported here under the auspices of the State Board of Horticulture. Mr. Klee has had a number of specimens sent to him, and he is now engaged in propagating in San Mateo County a small fly that deposits the egg in this bug and the egg developes and destroys the insect, and it goes on with an endless multiplication. I believe that we may expect much from these parasites, and as I told the convention at Riverside I believe that that is to be one of the great sources of success to import and cultivate these parasites, because nature surely has a way of wiping out or removing that obstacle. I believe it is our duty instead of succumbing to the bug, to work, to fight, and that we will succeed in raising good crops of fruit in spite of all these difficulties. I know our neighbors in San Lorenzo have been particularly cursed, we have had the canker worm, we had to band all our trees with a preparation of paper and to tar the paper every other day from January to April, in order to keep the foliage from being eaten off; but the cycle has come around and there is not now a canker worm to be found in the county; and so I apprehend with these other pests, that they will be self-limited and that in time they will

pass away, and I can only advocate a persistent perseverance in using the best appliances which we now have, and await the result.

MR. BLOCK: I agree with the gentleman who preceded me as to the importance of earnest industry and perseverance to destroy these insects. Now, a gentleman referred to freezing the bug; now, there is such a thing as smothering it, for the bug's breathing apparatus is the life of the bug, and you close that with oil or rosin, or some such substance, and you can destroy it. Now, let me give you a little of my experience with what you call the San José scale. That insect, when young, is very easily destroyed; you can do so very cheaply with rosin washes, and many other washes; you can destroy it, I venture to say, with a wash that won't cost you more than three quarters of a cent per gallon, and which will not injure your fruit. These rosin washes are good. When the insect is young, just hatched, you can penetrate and smother it, either with oil or a rosin wash. As it becomes older, if you neglect and put off the washing from time to time—I venture to say that this time is a good time to wash your trees—it is true that the foliage may prevent you sometimes from reaching the insect, but just as soon as you can wash it I am satisfied that you can use a great deal less strength and destroy them, than as the season advances. I believe that the coating that the insect gets, with one spraying it is harder to destroy; it sheds, I believe, about five times before the spring, and it makes a covering after it sheds each coat, and remains with the covering over it, and so on until you have got to penetrate five coverings before you can reach the body, but if you did so at once you could destroy it much easier. I depend a great deal on summer washes for destroying any insect, and I have been very successful with them; but I do not claim that I can extirpate them in the summer, from the fact that the foliage prevents me from reaching every part of the tree; the foliage prevents me from destroying it, but you can save your fruit; you can keep the tree clean, figuratively speaking, not entirely free of insects, and if you follow it up I am satisfied you can destroy it; but if you wait until the five coats have accumulated, in the spring—by that time the buds have begun to push out—you require much stronger liquor to penetrate it, and I venture to say that you are not quite as successful in reaching it, and the solution you use is strong enough to injure your buds in many cases, not all, but many cases, some varieties of fruit buds that are more easily affected than others. If we make experiments in that way and compare them, get information of others—I have reference to the San José scale—I am satisfied I can extirpate it, and I am satisfied that the other, with persistent effort, can be exterminated; at any rate, this can be kept in check, and will not do much harm.

MR. B. M. LELONG: I think the best way for a person to find out what remedy to use, or the one that kills the insects, the best is to examine the fruit during the summer when it is in market and find out whose fruit it is, from whence it came, and the remedy used. I went around this year since early in the spring, and examined the fruit from the different localities all over the State. Some of the fruit was all marked and stained and others were burnt with caustics. I inquired at one time of Dalton Brothers as to some fruit which was very clean in boxes and they told me it brought 35 cents a crate more than any others, and why? Because the tree had been washed by a certain remedy; they were from Mr. Runyon, of Courtland; that he had been using a rosin wash during the summer and his pears were very clean, not spotted. I saw others badly burnt; also peaches damaged in the same way. I saw peaches that could not be given away, and the commission man told me he had to pay men to cart them off. So it is all over the State; one man would send in a carload that

would be perfectly clean whilst his neighbors right alongside of him would send a carload that was badly affected with codlin moth, and by the time it reached San Francisco the pears and apples were full of worms. I took note of all this, and on page 379 of the third biennial report will be found the remedies used by these gentlemen. The name of the party is attached to each remedy, and if any one will do as these gentlemen have done, they certainly can make a success of it.

Mr. I. H. Thomas, of Visalia: Three years ago last August the authorities notified us to spray trees. I did not have very much faith in spraying, and dug up my orange and some walnut trees; there is perhaps a hundred large walnut trees left. There is no scale on those trees and has not been. I will refer to Mr. L. H. Titus, who has a place near Alhambra, and last summer I think he had about forty acres of orange orchard, one hundred and twelve acres altogether, he sold for $21,200. The scale had taken possession of that orange orchard and the speculators bought it and were going to cut it up and make money out of it. I saw Mr. Titus perhaps three weeks before I went home, and he said "I have got some good news; I was looking at my old orchard and found that every scale in that place is dead;" and said he, "What is the cause of it?" I couldn't tell; I do not know, but I know it is a fact that they are all dead, but whether they will come again, I have nothing to say. But it shows a little encouragement to find that in that large orchard, where the trees were covered by scale, that they should be dead.

Mr. Johnston, of Richland: Perhaps there is something beyond a remedy that we ought to inquire into. There is an old adage, we have often heard repeated, "An ounce of preventive is worth a pound of cure." Isn't there something beyond these cures that we should inquire into—the reason why we have them? Is there not something in the laws applicable to the animal kingdom that is also applicable to the vegetable kingdom? I remember of hearing my father, an old Pennsylvania farmer, when his neighbor inquired of him how to cure the hollow horn in his cow, tell him the best cure he knew for a hollow horn was a full manger. He said to a neighbor, whose colt was infested with insects, when he inquired how to get rid of them, to make a hole large enough in the corn crib for the colt to get his head into. Is there not something of this kind applicable to the tree? Can we not find something that will prevent these insects—something that will enrich the tree, or enrich the soil to such an extent that the tree will be so fat that the scale insect cannot live upon it? These are questions that I would like to hear discussed. The questions as to remedies are well enough in their place; but if we can go back of that, and find the cause, and remove the cause, we will need no remedies, for I take it for granted that a scale is the result of some disease in the tree. We find that the cholera never visits a cleanly city. The yellow fever never visits a city that is properly taken care of. If it does, its ravages are limited. It seems to me we can find something of that kind that will be a great deal cheaper—something that will fertilize our soil, or our trees, to such an extent that the scale would be of no effect. It has been remarked here that we suffer more from a few persons to have a few trees in their yard, and neglect them; that they were worse infested with the scale than orchards that are well taken care of. That seems to be an argument in favor of care and culture, or of nourishment. These neglected trees are sickly, and are certainly more liable to be infected with scales, or any insect, than the healthy tree that is properly cultivated and properly nourished in the orchard; and, from my experience, those that are the best taken care of, best ferti-

lized, and, in a word, are properly taken care of, are less infected with insects than those which are neglected.

Mr. Wilcox: Mr. Block has the oldest orchard, and I want to tell you that Mr. Block fertilizes his old orchard; it was run down when he took it, and he uses every kind of fertilizer that he can lay his hand on; he keeps a lot of boys going around with carts after ashes and hair from the tannery and the refuse spent hops from the brewery, and all that kind of thing, and I have often thought that Mr. Block's remedy for insects has been found in something deeper than he has made known. I want to say that I exterminated the black scale on my farm, which I found on two orange trees, one a Japanese and the other a sweet orange, and the way I did was to cut that tree within six inches of the ground, and to burn all the top in my stove, and there never has been a black scale in that farm since. I think we ought to say something as to the marketing of our fruit; it is certainly discouraging for any one to try to exterminate scales when you buy fruit in the market covered with the scales; we can hardly buy a lemon or an orange without we see the evidence of it, and we ought to have some means of preventing the spread of these insects in that manner. The only thing we have any great difficulty with in Santa Clara County is the codlin moth; that has wings and goes from orchard to orchard, and we can see the evidences of its work and that of the San José scale (so called) upon our fruit in market. If that fruit should be confiscated by law, sustained by public opinion, that would be the way to give it the most effectual blow.

CALIFORNIA HORTICULTURAL INTERESTS ABROAD.

Remarks by Mr. D. Lubin, of Sacramento.

I had intended to give the gist of my experience and observation in European countries, especially in the fruit belt—as I walked and rode over a great deal of that country—in relation to the question of fruit pests. I inquired of members of the Prussian Government as to what they did there. In going to these foreign countries I had letters of introduction from the United States Minister, and took an interpreter with me in Austria and Germany especially, and it would have appeared to me that the solution of this insect pest question could be best settled if we could have the mode in vogue in Germany at the present day. I do not believe in copying as a general thing, and I do not believe in the German mode of copying, especially. I saw there in their agricultural implement shops, the Oliver chilled plows and other instruments we have here. I believe that people should have some originality, but at the same time I do believe that when people have been engaged in an industry from before the time of the Cæsars, that there are some things that they know that we should adopt immediately, and if possible improve upon. I am speaking now of this question because I believe the subject is even of more importance than the other one. In Germany they have the most perfect system; the professor, who was a leading scientist, gave me to understand that there was a special society, a head chemist, a botanist, and an entomologist, and what position he held I do not know; he was chief of all of them, and that appertained only to insect pests; they had nothing to do with those branches at large, and then they have a staff of competent officers sta-

tioned in various counties, all paid men, and then they had laws on the subject, and their mode of conducting this warfare against insects is, I think, admirable, and should by all means be copied here if you wish to accomplish anything. When this gentleman explained the system it appeared to me to be very arbitrary, more on the military style, and in fact the country is governed to a great extent on military tactics, but in this particular they are extremely rigorous, and he gave me to understand that this local man is governed from the head organization, and this lowest man is the man that is held responsible—personally liable for fine and imprisonment if he don't attend to his duties properly; he would have his star or badge of office and go to the fruit grower and look around, and if he discovered any evidence of insects he would tell this man to apply these remedies, and to apply them right away, to-day. "Well," I said, "supposing you don't wish to?" Well, "O," he says, "if he don't wish to, the officers travel along with the apparatus, and he would bring in his apparatus and the remedy as given him by the chief professor; if he didn't apply that, it would be applied by the government, and this man would immediately be brought before the government and fined, or imprisoned, or both; there was no appeal to a jury or anything." "Well," I said, "isn't this extremely rigorous?" He said, "We treat pests just the same as cholera and yellow fever should be treated; it is extremely dangerous. Now," he said, "it costs France a great deal more for its neglect of this thing that Germany has done, than it costs to pay the indemnity for the war."

I read an account yesterday, that if true, is the most singular fact that has been announced in this century: It cost France 400,000,000 pounds English money, to fight the phylloxera, and they are still fighting it. Now I do not know how much the State of California would sell for if put up at auction to-day; I don't think it would sell for $2,000,000,000. Can any one tell what the war of the Rebellion cost this country? I don't think it cost us $2,000,000,000. And they are still fighting—Germany does not fight because it has placed its line of officers there and they are responsible. We have not heard that Germany has got the phylloxera, and this is the reason; if they discover the slightest trace of phylloxera they dig up every vine down to the finest roots and burn it up with kerosene oil and fill up the land. I said, isn't this an injustice? He said, it is an injustice to this man, and he suffered, but he says we have kept Germany free from the phylloxera and we propose to keep it free; it is an enemy. Here at the present time if my friend Mr. Klee is permitted to go into an orchard and look around, well and good; if not, there is no help for it.

There is another matter. If any one had proposed that matter to me, Mr. President, some two or three years ago, as I proposed it to this body, now, I should have thought him a little previous, and probably that he didn't know what he was talking about; but these things as they appeared to me upon examination, one fact upon another, and their inferences, gradually worked themselves into a consistent idea, and that is that it might be possible, notwithstanding the cheapness of labor in Europe, that we can, in fact, compete with the people of Europe, and I confess that I have had great misgivings in the matter. Passing through Spain I inquired the price of labor. One *peseta*, which is not quite twenty cents; no board, no lodgings. The price here is a dollar a day and board—equivalent to a dollar and a half; but I reasoned, how is it possible that these raisins that are raised at the rate of twenty cents a day come into New York City, and we meet them there at the rate of a dollar and a half a day and create a market? This can be explained only by two reasons. One, that they bought the raisins because we are acquainted, and they like us and like to

accommodate us, or else that there is an advantage. Now if there is an advantage inherent in one box, that same advantage is in a million boxes. Now the question arose, is there an advantage? And I began to figure on it, and for a time it was a very difficult thing for me to solve, and finally I came to my conclusion. I was met on every street and corner and highway by bands of soldiers. Now who pays for the marching of these men? The government; and that is an element in a box of raisins, even. Now upon closer inquiry, who owns this land? It was a seed renter; above him the speculative renter; above him the lord; and above the lord the great navy they have in Spain, second only to England's; above the great navy the army; above the vast standing army, the aristocracy; and above the aristocracy, the king; and every item there counteracts the dollar a day and board. That is either a fact, and truth, or it is not a fact, and false. How then is it that the raisins are sold from California against the Malaga raisin in the City of London? When in the City of London, I spoke of this very thing, and wanted them to prove why it was not an advantage to handle our raisins. They say you can handle it in New York, because you stopped there; but if you go further you will pay an extra charge, and by the time you get to London, you have lost your advantage. I say yes; but as we come here you go there. If we have an expense coming here, you have an expense going there, so we are even. Now it is a matter of public notoriety that an attempt was made, and the raisin was brought to London for the first time. I find here from the "San Francisco Bulletin," under the head of "Trade and Finance," on October seventeenth, what if true I consider to be a most important item of news for the State of California. It says: "*A few weeks ago we noted the shipment of three carloads of California raisins to London, direct from Fresno; other lots followed from points further south; these shipments have since been heard from. They brought better prices in London than the best Malaga layers. The shipments have been a good advertisement, and have resulted in orders for raisins from Amsterdam, Vienna, and other European cities.*"

In Europe, when the king dies, they say "The king is dead; long live the king." There was a time when France supplied the world with wine; France has no more wine to export—there is no question about it; more especially as 95 per cent of the wines used throughout the world is the *vin ordinaire*, not that wine which sells for five or ten or fifteen dollars a bottle, that royalty has for its table, but the wines used by the people of the world. There is not a meal taken in Europe unless wine is found on the table; now France supplied 95 per cent of that wine, to-day she is supplying the same 95 per cent. Now where does it come from? They told me to go over to Algeria to see; we crossed over to Oran, and I expected to find a wild, barren country; in the north of Africa we traveled along a distance of two hundred and fifty miles, and there is where the vineyards are producing, not the noted French clarets as of old, but a wine of scarcely any commercial value, less commercial value than the poor wines of the south of Italy, and these are taken over to France and blended and sold, and sold in Sacramento and Los Angeles and San Francisco, and many of the restaurants there, who would sneer at having the California wine, will bring you out a bottle of adulterated; and wine that they should sell for half a dollar a bottle, to give the grower $35 or $40 a ton for his grapes, is thrust aside, and the grapes dried and sacked. And I have this to remark in relation to the drying of the grapes—my friend from Penryn said he had found a splendid remedy now for getting rid of his wine grapes, he can dry all his grapes and sell them—it is one of the nails in the coffin of that industry in California; the stuff that is dried in sacks is used to kill the industries of

California; it is bought by those who make an adulterated mixture, and who palm it off for California wine, and it may take centuries for this State to recover from this calamity of sacking up and drying the wine grapes; they should be sold in a ripe state, and at a respectable price; we have either a good table claret or we have not got it; if we have not got it we should not go about the country and lie; if we have got it, then we have something that Europe has not got, and it is time to take that wine right over the heads of those people that refuse to buy it; New York, Pennsylvania, Ohio, Indiana, say they want French wine; carry the war into Africa, bring it right to Europe, present it there, and urge your claims there, and when the wine gets a reputation in the City of London, which it will if it has merit, then the New York man will come and say I want some of that wine, and not before. Now either there are these things or there are not; the wines will, when tested, prove whether they have merit in them; if they have, then we have the world for a market.

How then can we find these things out? Let there be an exhibition. I thought at first that Central Europe would be the place. I suggested to Mr. Judson, United States Consul, that Vienna was central enough; he said, "No." "How about Paris?" He said, "No, that is no good at all, because they grow the things you want to sell; Berlin is a good place, but they will say you have got some scheme to induce immigration, and they won't like it." "Well," I inquired, "where is the place," and was told at London, and when I came to the City of London, I found that the people had anticipated my idea, and the day I arrived, there were four foreign exhibitions, and the grandest exhibition I ever saw in my life, not excepting international exhibitions, was going on in the City of London by the Italian government, and covering an area of some twenty acres of ground. They knew that the exhibition was coming on this year, and they did not pay any attention to it; that was the place to sell their wares and the kind of people that they wanted to induce to travel through their country and fill their hotels. We have either a great future before us or we have not, and to find that out we should go there where we will be recognized in our true worth and true value. As it is now everything is done wrong; we are sending our grapes to London to be manufactured into spurious wines; we are sending the kind of fruit that is killing the reputation of that fruit. Follow this industry as it is done, without check, and send job lots to London that has been done by the packers, and in foreign years the Italian, the Spaniard will say, "Hurrah for us, you are done for!"

In the City of London, at one of the best known houses, one of the proprietors, Mr. Blackwell, gave me an instance of the California industry. He opened out some samples, and he said, "You have got nothing but rubbish; you have no recognized trademarks; you have no recognized stamps. When something is wanted that go for slops and job lots we go to you. When we want something that is marketable—that is merchantable—we go to the older markets of Europe." And I denied the statement, and told him that we had the best in the world; and he said, "We will see;" and he opened out his samples. Now, what has happened? The good packer comes from an orchard, and the fruit grower comes, and says, "I have got a nice fruit crop." And the packer says, "How much?" The fruit grower says, "Two and a half cents." "Two and a half cents. All right; I will see you next week." And next week he buys it for a cent, and he packs that stuff. And I saw there one half of an apricot that was underdone, and the other half was mushy. The can was poorly soldered, and the syrup had become affected from the poor workmanship. In short, it is made as a lot of stuff to beat the world, and what does it do?

When the Lisbon fruit is put up every half apricot was just the same as if you had taken it from a mold—perfect; and the syrup was clean; and even the laying in of these apricots was done in a systematic, proper way. Now, sir, see the difference. The price of these is $2 a dozen—8 shillings; and the Lisbon, 24 shillings—a difference of 16 shillings. But you say, "You sell a great deal more of these than you do of the Lisbon." "No, we do not. This is not salable here at all. A poor man cannot afford to buy any kind of fruit. He lives on vegetables, mush, and soup, and black bread; that is all. But the rich man don't want any stuff like that. He wants the best; and the dishonest steward will come around and buy this, and say he has bought that." "Now," he says, "this is of no value. It is doing you an injustice." I sent out a communication to the "Rural Press," and gave the name of the packing company that I found on the label; and I don't know why they did not put the name in there. I think it should have been done, for they were doing very great harm to California. Now, if we have advantages we can make them known.

Again, these people that are working for 20 cents a day, do all their work. I followed them right in the field, gangs and gangs of men, and women, the women especially, expert with some kind of a shovel that they work on that side and they cannot do very much in a day; and they have got old worn out lands, another advantage; in this country the custom is to have the farmhouse adjoining the farm; they do not live that way in Spain and in Italy; they have had so many years of war that they are inclined to live in villages four or five miles away, and they have got to come to work and to go back—quite a ways to travel—and take it all in all they have not the advantages that we have; even in the matter of labor I doubt that the men there could do any more than ours do; add to this, that we are here living in a republican form of government, and that they are living under a monarchial form of government with the peculiar disadvantages of that form of government. I am not prepared to say that I know it absolutely, but there is a very strong probability, by a great effort on the part of the people here we can determine that so far as land and fruit is concerned that we have every advantage over them, and that they will not be able to gain this advantage unless they adopt this same mode of government, because it costs an immense amount of money to keep up a monarchy. Now these matters have been laid before before various people; I invited the State Board of Trade, men of experience, of intelligence, and a committee was appointed, and after a thorough investigation adopted my views; and my object in coming before you is to have the indorsement of this body in carrying out this work. The question of the exhibition of having a market is only one side of the plan; the Commissioner is sent there for the purpose of attending this exhibition and may be instructed to bring back with him products of Europe, the manner in which they are put up, the cost of their production, etc., so that we may be informed. In this behalf I offer the following resolution:

Resolved, That the convention here assembled indorse the action of the State Board of Trade in taking the initiatory step towards holding an exhibition of the products of California in the City of London.

Resolved, That in our judgment, an exhibition of the products of California in London would tend to greatly accelerate the progress of this State.

Resolved, That it is the sense of this convention that this matter shall properly, and without loss of time, be placed before the coming session of the Legislature of the State of California, for due consideration, to the end that the same receive legislative sanction and State financial aid.

On motion the resolution was adopted.

INSECT PESTS.

CONTINUATION OF DISCUSSION.

HON. A. P. HALL, of Penryn: I believe it is almost impossible to entirely eradicate the pests, still I think that certainly the condition of things that we are bound to meet, and that condition of things there is no remedy for. The only course left for us is to attempt the best we can under the circumstances, and that is the way, it seems to me, with the limited knowledge that I have, that is the only course left for us if we wish to make the fruit industry in this county a success. With the limited experience I have, it seems to me that the feeling among the people of Placer County is this: while they believed at one time that the fruit pests had almost got possession of their orchards, there seems to be almost a total revulsion of that feeling, and now they have got confidence that they have the best of it. I think that there are some sections in this State that are better adapted for the propagation of the scale insect than others, and I believe that the hotter and the drier the climate is the sooner you will get rid of them. In our section of country I am assured by fruit growers that the scale is fast disappearing. I had a letter from a gentleman living up in El Dorado County, in which he says that the scale is making its appearance, and he wrote to me to get a wash which I had been using. When I bought the place that I am now occupying, nearly five years ago, it was badly infested with the San José scale; I knew nothing about it, and when I came to find the condition of things I felt very much disheartened, and wondered whether our fruit interests were to be annihilated by the scale; but I went to work getting information from my friend Mr. Butler and others who had had experience in this matter, and I am happy to say that my place now is fairly free from the scale insect, and I firmly believe the time will come when the scale insect in this State will be considered a thing of the past; that it is one of those pests that spreads itself over the world at different times, and gradually it will wear away without seeming to have any particular cause for it, but at the same time I believe that it can be hastened to a very great extent by the active and energetic work of the fruit grower who feels any interest in the matter. We in our section are using a simple remedy with great success, but it may be in other localities it would not do. I take a pound of sulphur, a pound of concentrated lye or caustic soda, and a gallon and a half of water, and I boil these together for quite a length of time, an hour or two, then I add a half a gallon of the commonest fish oil I could get instead of whale oil, and boil that until it is converted into a soap; it takes some time to do that, and while in the kettle, just as soon as it is converted into soap, I add a half gallon of coal oil while it is hot, and stir it up so that it mixes thoroughly, and then put twenty-five gallons of water and gradually beat it up until it becomes a homogeneous mass—it makes a milky preparation, but it remains thoroughly mixed without any trouble.

A DELEGATE: You make an emulsion of it?

MR. HALL: Yes, sir. I apply it cold and use it in the spring of the year, just as my tree is coming into blossom, and in fact while in blossom. I use it on all kinds of fruit with the best kind of success.

MR. BLOCK: What effect does this wash have upon the pit fruit?

MR. HALL: I did not notice any injurious effect on the tree, only on the scale. I think we ought to make the proper application of this or some other preparation every year, and we will make the fruit business a perfect success in California, and we will have to make the thousands of acres which are now being put out profitable to those who have planted them. We have got to work constantly against the ravages of these insects, and if we do so I am confident it will gradually disappear and we will make the fruit industry the greatest industry of this State.

MR. GRAY: A year ago we had very good reports from those who had used the lime, salt, and sulphur. I want to know if there are any more members of this convention that have tried that, and if so, with what success.

DR. PECK: I want to say one word in regard to that, that they are using it constantly in Placer County, and with success.

MR. BLOCK: Do you mean this remedy which Mr. Thomas recommended?

DR. PECK: Yes, sir.

MR. BLOCK: What effect does it have upon the fruit?

DR. PECK: I have not heard any complaint. We have good crops, and all the fruit we can handle; as to the time, some of them are spraying now. We have no white or black scale.

MR. I. H. THOMAS: I have used this lime wash for the San José scale, and know that it is effectual for that; I would like to know how it is on citrus fruits.

DR. EDWIN KIMBALL: I cannot answer to that; we have only the black scale on the olive and other trees around the bay, but I will say that any of those preparations of lime which are given in the reports, I believe are the cheapest and most effective in stamping it out. I know of one pear orchard planted eight or nine years ago, where the trees were obtained from San José and infested with the San José scale, and they tried petroleum, potash, and caustic soda, with severe injury to the trees, and the scale survived all those applications. I have found in one particular orchard of about two thousand pear trees, that one application of this lime, sulphur, and salt wash has seemingly thoroughly eradicated it. The trees were trimmed first after the leaves had fallen, and then the orchard was thoroughly sprayed, and the earth removed from around the roots, and the water allowed to run down and penetrate around the tree. In my experience, it is the very cheapest and most effective wash we have for the San José scale on deciduous trees; there are a number of different formulas, but they differ but very little, and it kills every scale it comes in contact with, but as we do not have the cottony cushion scale, I cannot speak as to that.

MR. BOOTH, of Roseville, Placer County: I hope you will not have the idea that old Placer is infested with the scale; because it is not. I have a place that has been growing thirty-five years, and have yet to find the first scale of any description; and I hope you will not have the idea that we all have to wash, for I have not begun yet.

MR. PECK: Mr. Booth had better begin right off; for three years ago I said that I had not a scale in my orchard, and the next year I had it; and if I had washed it might have saved trouble.

MR. BLOCK: Mr. Hall gave an old remedy, somewhat changed. The reason I asked whether it affected the fruit or not was, that I thought it did affect pit fruit. It was a good remedy for pears and apples; and I was glad to hear that Mr. Hall had no difficulty with the pit fruit. Mr. President, if you will allow me, I would make a suggestion that will be of interest to the fruit growers. I see a recommendation is made of Mr. Ongerth's wash. I know in some cases where it has been injurious, unless

thoroughly condensed. I think we should be very cautious in recommending anything until we have had experience with it. It is very true that Mr. Ongerth's wash has shown good effect, at first, in some instances, and has been recommended conscientiously and honestly; but in the course of time I have heard, and I have seen in many instances, that it had a very bad effect when used by those very parties who originally recommended it, and I should be very loth to recommend it. I say that in the interests of the fruit growers; but I consider it my duty to direct their attention to the matter. I hope, in the course of time, that you will be justified in recommending it. Many of these washes may, with a certain strength, be beneficial, while, if used stronger, would be injurious, and that may be the case with this wash.

Mr. Lubin: I have here a statement from this high authority in Germany, that it is impossible to eradicate these insects that may be picked up here and there. I read the exact words. *This was in the Royal Agricultural School at Berlin, Professor Dr. Whittmarck, who occupies the Chair of Practical Botany of the above institution, and Systematic Botany of the University of Berlin, also Secretary-General of the Horticultural Society of Prussia. "Have there been any practical advances made in entomology with the result of averting the disastrous tendencies of insects? Answer—No; that is to say, no absolute remedy has been brought forth to the present day that will exterminate all or every kind of insects. We have arrested the danger of the phylloxera and Colorado beetle by the severest measures; we have also got within recent times police regulations, and our attention is now directed to destroying the woolly aphis. Question—Are your police regulations well carried out? Answer—Yes, sir; they are carried out very well. The professor gave me to understand that in case any phylloxera or other dangerous insect appeared in any place, the remedy would be applied at once, and in case of the phylloxera, the vines would be uprooted and the ground saturated with petroleum, and in addition to that the hair fibers were all burned and the ground saturated with petroleum.* Drastic measures were resorted to, and in no case was the eradication of dangerous insects left to the inclination or ability or knowledge of the owner or renter, but the government officials and police would promptly take possession of the affected ground and cure by annihilation that which could not be remedied otherwise, and in this manner they have thus far been able to keep the dreaded phylloxera, the Colorado beetle, and other dangerous insects at bay."

Mr. Butler: Although the German government, according to the information given by the gentleman, adopts these radical measures to prevent the extension of the insect pests, as they can do it under that monarchial form of government, it seems to me it would be impossible to carry out such measures in California. If such is the case, all we can do is to adopt remedies that we consider best. It seems to me that so far as the remedy for insect pests to be used on deciduous trees, this sulphur, salt, and lime remedy seems to be the most desirable of any; it is very cheap and very effective. So far as the remedy for the fluted scale, the rosin remedy spoken of seems to be the most effective, and as good results have come from its application in Los Angeles, it would seem to be the one that should be brought into general use. There have been many remedies brought before the people, and if these are the best, I think it would be well to take the sense of this convention in their favor, and have them brought into general use. I do not feel discouraged as some of the gentlemen. I think the sentiments expressed by the gentleman to my left, that seemed to be so radical, were most excellent in the introduction of this discussion, as it has brought out expressions we could not otherwise have obtained; but we should not

be disheartened as Mr. Hall; he was discouraged at first. I remember when he first purchased his orchard in Penryn; he took me into it, and I saw the ravages of the San José scale, and I thought it would be as cheap to cut them down and destroy them; he did not do it, and this year, to my knowledge, he has had a very fine crop of fruit, and our people are not discouraged on account of these insect pests. We feel that we have to work to keep these insects under; we do not hope for their annihilation at once, but we hope that the time will come when they may be exterminated. They may be exterminated by the processes of nature, but we do not expect it in the near future, but the time may be hastened by what we can do, and we can keep them in subjection so that it will be possible to run this industry of fruit growing without fear of its failing.

We should not be discouraged, the whole world has something to contend with, but we must do our share in proportion as we extend the fruit industry, and as we extend the fruit industry in proportion, we shall find ways and means to keep the insects in subjection, and to aid the production of our fine fruits. As far as the cottony cushion scale is concerned, we have none in our county—that is, generally, the Sierra foothill counties have not been troubled to any extent. At the same time it has been generally expressed that we are subject to it. I remember a year ago at Santa Rosa, a gentleman said that there was no section of our country that was free from it. They are liable to be infested, but I think from the experience of some of the gentlemen in the south, notably the gentleman from National City, that they can be exterminated. When south about a year ago, I found the Riverside orchards entirely free from the cottony cushion scale, and some prominent gentlemen who are in a position to be thoroughly posted, said they knew of none in Riverside. They did not claim but what they were liable to have it, but they proposed to take vigorous measures to exterminate it if they found it and then keep it out. It seems from the testimony of many of these gentlemen that it is not necessary for them to get a foothold, and when they don't they can be exterminated, can be kept down, and we can preserve our fruit-growing industry without being very seriously disturbed.

Dr. A. F. White, of Santa Rosa, moved that a committee of three be appointed to consider the subject of the German method of treating insect pests and to report.

Motion carried.

The President appointed on said committee Dr. A. F. White, Hon. S. J. Stabler, and Dr. Edwin Kimball.

The convention here adjourned until the following morning at nine o'clock.

SECOND DAY'S PROCEEDINGS.

CHICO, November 22, 1888.

President Cooper in the chair.

OLIVE CULTURE.

Essay by CHAS. DONDERO, San Francisco.

LADIES AND GENTLEMEN: In a communication to the "San Francisco Morning Call," I alluded to the respective merits of California and Italian olive oil. I did so, prompted by what I deemed a sense of justice, and I certainly had no idea that I would be called to the honor of appearing with this memoir on the olive, before a vast assemblage of California's most intelligent horticulturists as this convention is composed of—citizens of this blessed land of matchless freedom, who, like the Romans of old, have selected their noblest legislators and magistrates.

I shall endeavor to be brief, but necessarily exhaustive. I shall not present you opinions or theories, but the practical experience of ages. I will give you the best results yet attained in olive culture, and the key to its greatest success.

And, as gratitude is the most divine of man's virtues, and you are a sublime example of it to the world as a nation with your annual Thanksgiving, so I will here say that for nearly all my statements, although born among olive groves, as the largest portion of my industrious countrymen, I am indebted to first-class practical agronomists such as Bechi, Capponi, Passerini, Ridoli, Breamonte, the Presidents of the Chamber of Commerce of Siena and Porto Maurizio, the Minister of Agriculture, and to my lifelong friend Gattorna, now of Santa Clara Valley—a modest and intelligent agriculturist with a heart as big as the wonderful lens of the Lick telescope overlooking that charming spot.

There are no countries in the world so similar in topographical conformation, position, climate, and agricultural products as Italy and California. Whatever grows there will grow here, and vice versa. Italy has a matchless sky; California a blessed exemption from desolating storms. Italy has a finer flavored, California a larger fruit. Italy has tenacity; California a most productive soil. Italy's fruit has a longer keeping power; California's ripens much earlier. California has insect-breeding fog belts; Italy the source of the proper remedy.

The olive is justly considered the Providence of Italy. It was undoubtedly cultivated there before Cassandra's prediction on the fate of Troy; before Homer had immortalized the wrath of Achilles. According to history, the great olive trees yet seen around Tivoli, whose gigantic forms rival the majestic Sequoias of the Sierras, were already old when Romulus traced with the plow the walls of Rome—the city whose genius was to shape the destinies of nations for centuries. Since then mighty rulers, powerful empires, bright and barbarous civilizations have arisen and dis-

appeared; but the olive giants, untouched by all vandalic invaders, respected by the hurricanes of thirty centuries, are there, covering nearly an acre of ground each, vigorous and productive as in the days of Christ, as if to say: With all thy intelligence and cunning, with all thy pride and vaunted superiority over all other beings, how weak and insignificant thou art, oh man!

The average duration of this precious tree, however, is considered two hundred and fifty years—long enough for us all! It begins to bear fruit at the seventh year, if well cared for and grafted in the fifth. Its production increases until the age of forty or fifty. It remains then about the same from year to year, if properly managed, with a perceptible improvement in the quality of its oil.

Italy produces more olive oil than all other countries combined. France has only eight districts in which the cultivation of the olive is possible. The annual average of its production, continually decreasing on account of severe winters, is one million two hundred and fifty thousand gallons. Spain produces about fifteen million gallons. Portugal, Algeria, Tripolis, Egypt, Greece, Dalmatia, and other countries about eighteen million gallons. Italy's annual crop is averaged at seventy million gallons, and it increases from year to year. By the perfect methods of cultivation now introduced, with selected stock, Italy's production will be nearly double in the next twenty years.

An olive grove in that country constitutes the luxury of the wealthy, the resource of the poor, the blessing of all. Adolph Flamant, in his interesting treatise on olive culture, tells us that a piece of bread, a flask of wine, and a pocket full of olives form the noonday meal of many laborers in the south of France. I will add that *polenta* (a corn meal mush), with olive oil and wine, is the most substantial noon meal of millions of hard working Italians.

It is due to the providential olive oil that Italy never had to suffer, during the appalling pestilences and barbarous invasions of the dark ages, or at any other ancient or modern period, such fearful famines as other countries had. A piece of black bread and oil aided more than once brave defenders in saving cities from destruction. Garibaldi and his fearless followers would not have won the desperate battle of Milazzo and broken the chains of tyranny to eleven millions of people, if the providential oil had not saved them from starvation. It lingers yet in my memory, a saying of my grandmother, at a time when the rapacious legions of the first Napoleon on one side and the cruel Austrian hordes on the other were desolating her home and olive plantation: "Children, as long as we have in the wallpit a sack of bran and a jar of oil, God is with us and our country."

I trust that man's crimes and ambition will never plunge this glorious country into such a dreadful condition but the cultivation of the olive will be found none the less beneficial and useful to its generous and prosperous people.

SOIL AND CLIMATE.

There is no fruit tree as easily contented as the olive, nor so liberal to its owner for the same amount of care. Any soil will do, although calcareous formations are among the very best. It fruits with the greatest perfection in the porphyritic and slaty regions of Liguria, in the calcareous and marlic soils of Tuscany, in the argillaceous and sandy strata of Umbria, in the volcanic formations of Apulia and Sicily.

Is there any one among you that ever approached Italy by the sea, particularly the coast of Liguria? That stretch of land from horizon to horizon,

whose picturesque villages gladden the weary mariner on his return to the bosom of his wife and children; that garden spot of unsurpassed beauty, in whose balmy atmosphere queens and emperors seek rest and health, was once nothing more than a rugged and stony region, and it was converted into an olive grove of more than one hundred miles in extent, because nothing else could then be grown on it.

It is, however, a great error to suppose, as many do in this country, that the olive will thrive on poor as on good soil without helping it with the proper food or fertilizer. A horse cannot fatten on straw as on barley. Wherever the almond tree will bloom the olive will succeed with a greater certainty, except in damp localities and atmosphere, as foggy districts generally are, for they breed the worst diseases and the most disastrous insects. There is but one variety of the olive family profitably cultivated in foggy districts.

An excessive heat is not as damaging to the olive as an excessive cold. Sudden changes of atmosphere are injurious at all times, particularly during the fruit season.

On level and low ground the tree grows more vigorously and bears larger berries; its oil is greasy and coarse but more abundant. On high and rolling soil of identical formation the same variety of trees grows of lesser size; the berries are proportionally smaller, but the oil is of a much finer grade. The compensation between low and high elevation may thus be considered about the same.

In the central and northern parts of Italy, where the winter temperature is certainly more severe on an average than in Central and Northern California as far as Mendocino and Shasta Counties, the olive culture is profitable as high as one thousand five hundred feet from the sea level. The olive belt rises as we proceed toward the south, where in Sicily it reaches an elevation of two thousand nine hundred feet.

The olive puts forth at 53 degrees Fahrenheit, it blooms at 68, it fruits at 72. It is thus seen that a locality in which at the time of blooming and fruiting the temperature does not reach such degrees is unfit for olive culture. On the other hand, the olive will bear no fruit where heat reaches 120 degrees.

In dry weather cold will affect the tree only at 20 or 25 degrees below zero; but in damp weather, if the soil and leaves are wet, frost may damage the tree at 5 or 6 degrees.

Any position is equally good for the olive. In very warm localities, however, a western position is to be preferred, while for cold places a southeastern inclination is the best. In all localities exposed to the damaging north wind a western facing is also to be desired, for it is the evening sun that often saves us from a visit of king frost during the night.

THE BEST VARIETIES.

As in the case of vines, different olive trees produce a different oil, although, for the nature of things, the difference is never so marked as in wine.

There are about thirty different species cultivated in Italy, among which the *Olivastro*, progenitor of the California mission olive, and the *Leccino*, known also under the name of *Picholine*.

The first has a good sized berry, but is one of the poorest bearers; and its oil, characterized for its bitterish taste, never reaches 13 per cent in quantity. The *Picholine* has a much smaller berry, but is a better producer; and its oil, although never ranked among the finest qualities, is far

superior to the other, and its percentage of first and second extraction go as high as 16.

It is, however, an esteemed tree only for its resistance to frosts. For this reason it is the preferred one in the severe climate of France, where it was introduced by an Italian named Picholine.

The varieties most esteemed for their oil and abundance of berries are the *Morinello*, *Frantoiano*, *Taggiasco*, *Correggiolo*, *Gremignolo*, *Capraino*, *Giuliano*, *Giugiolino*. They are all beautiful trees, with the exception of *Capraino*, which is an ugly but very virtuous tree. While the other olives never ripen in Italy until the latter part of November or December, according to localities, the *Capraino* ripens its beautiful fruit in September. It is a tree lately introduced by the most improved methods of tree selection. It is, therefore, very little propagated yet. It has a berry almost as large as the Spanish Queen, and its oil of first and second extraction reaches from 25 to 28 per cent.

The *Frantoiano* is the smallest of olive trees. It is the most adapted for shallow soil. Its berry weigh, on an average, thirty-two grains, or about the same as the *Picholine*. The *Morinello* produces the smallest berry, with an average weight of thirty-one grains. It is an olive of exceptional fine qualities for oil. The *Correggiolo*, whose berry weighs thirty-nine grains, is only a fine producer in rich soil, sheltered from winds. The *Gremignolo* has a berry of thirty-four grains; *Giugiolino*, thirty-six; *Taggiasco*, thirty-eight. All these varieties go as high as 28 per cent of oil of first and second extraction, except the *Taggiasco*, whose percentage rarely is more than twenty-two. Such results, however, are only obtained by the method of cultivation which I will soon indicate. The *Taggiasco* is the largest of the family. Near the sea it grows very fast and bears soon and abundantly. From ten to twenty miles inland it will not bear till the twelfth or fifteenth year, and never a very large crop.

The Italian-Swiss Agricultural Colony several years ago imported a number of cuttings of the *Taggiasco* variety for its orchard at Cloverdale. They all grew very well, but there is no sign of fruiting yet, while in the Santa Cruz Island, where several of the same cuttings were planted by Mr. Rossi, they all commenced to bear, I was told, on the fourth year, or sooner than expected.

The *Gremignolo* is the only fog-proof of the olive trees. It prospers and produces most abundantly where no other olive tree will on account of fogs. It also resists remarkably well nearly all diseases and insects generated in foggy regions. The *Morinello* resists also very well to fogs, diseases, and insects, but not quite so successfully as his worthy brother.

The *Lucca* and *Giuliana* are most precious trees for preserving purposes. The first is equally as large as the celebrated *Gordal Sevillano* or *Spanish Queen*, and more fleshy. The second is the matchless queen of olives. It is grown only in the southern part of Italy, where the climate is never more severe than in California. While the *Lucca's* berry has an average weight of eighty-one grains, the *Giuliana* rarely weighs less than one hundred and forty. It is also a good oil producer, its percentage being from twenty-four to twenty-six for the first and second extraction. For preserving purposes it is generally cut into slices on account of its size. The tree bears heavily.

All the varieties stated, the *Taggiasco* excepted, fruit as largely anywhere inland as near the seacoast.

PROPAGATION OF THE OLIVE.

The olive is propagated by various methods: by seed, by shoots, by cuttings, and by woody balls formed in the bark of the upper roots of old trees. The propagation by shoots is now the preferred, because they root easier, and the plant grows quicker and more vigorous. As shoots are generally taken at the base of the tree, grafting is necessary. There is no economy of time between the cutting and shoot system. Trees propagated by balls are more subject to disease, and, as a rule, they live much less. The cutting system is rarely practiced in Italy. Propagation by seed is the favored method. It is by far the best. The tree thus obtained has a perpendicular root, which provides the life fluid to the trunk in dry soil and during droughts by its depth. It grows more vigorous than by any other system; it better resists storms and frosts; it is less subject to diseases and to insects; it produces more fruit, and is longer-lived. It is the seed olive and no other that has the virtue of rejuvenating in old age by the change of its bark whenever powdered, unslaked lime is blown once or twice into the crevices.

It is said that the seed system is too tedious and long. It is not so with the successful method adopted in Italy. For the olive culturist who is not willing to wait, there are excellent nurseries for his supply at cheap rates for the value of the plant. For the patient orchardist the difference between the seed and cutting, or shoot systems, is hardly perceptible, if future interests are considered.

The seed is procured during the olive picking. The berries of a vigorous growth—not too young nor too old—are chosen. All healthy trees have plumpy kernels. It is a law of nature. The selected berries are deprived of their pulp with the fingers. The pits are then washed in water and ashes, and rinsed in pure water. In February, or whenever the seed is to be planted, the pits are slightly cracked longitudinally, and put in well prepared and sheltered ground, near the surface, with some straw on top. The straw is kept moist. In forty or fifty days nearly all the seeds sprout. The plants stand grafting at five years, if properly cared for, and bear fruit two years after. It is thus seen that all other systems of propagation can only claim the advantage of one or two years at most, while the seed plant is vastly the superior.

Italians say that the man who is not able to get an olive out of its seed does not deserve to have a wife.

The grafting is practiced during spring time. It is practiced in several ways, all equally successful, as in other fruit trees. The main point to be observed is that the plant should be already in a sapping condition, while the scion should be in a dormant state.

The wound is carefully bound with asphaltum, dissolved over a slow heat with turpentine.

The planting is done by making holes three feet deep and four feet wide. The excavated soil is left exposed to the rays of the sun several months.

Some fertilizer of good quality is put in the hole, and is covered with soil. The plant is put in; after covering the roots with soil, more fertilizers are introduced, and the hole is filled in.

Irrigation is always most dangerous to the olive. The plant is sometimes benefited by it, but the quality and fineness of the fruit never.

Fifteen inches of rain, distributed in the course of the year, is enough for the olive tree, particularly when it commences to fruit.

SINGLE AND MIXED CULTIVATION.

The distance from plant to plant varies according to the system of cultivation and also according to the variety. Where nothing else is cultivated, twenty-four or twenty-eight feet is enough for a tree of small development as the precious *Frantoiano*. For all other varieties, from thirty-five to forty-five feet are necessary. The generous olive may pay you, however neglected, but never if you deprive it of plenty of sunshine and light. The greedy cultivator who crowds his olive trees, is apt to have the success of the greedy woman who doubled the food to her chicken in order to have two eggs per day instead of one. She lost not only the eggs, but the chicken also. Poor and small crops, diseases and devastating insects, are generally the result of crowded olive groves or fruit orchards.

The mixed cultivation is by far the best and most profitable. It requires less attention and fertilizers; it resists more to droughts, to diseases and to insects, and its crops are superior in quantity and quality. The distance of plants in this kind of cultivation is from forty to fifty feet for trees of small volume, from sixty to eighty for trees of large development.

Any other fruit tree may be successfully cultivated by the mixed system, and also any kind of vegetables. The olive, for its nature, seems to be rather benefited by such cultivation. Cereals only are detrimental to the olive tree, for they absorb much from the soil and little from the air, while the reverse is, to a great extent, with fruit trees and vegetables.

The principal objection to single cultivation is, of course, the crowded condition generally observed in such groves. A distance of twenty-four or twenty-eight feet for small trees, or thirty-five or forty-five for large ones, rarely afford to the mature tree all the sunshine and light required for its greatest success.

Long experience has proved that twenty olive trees in mixed cultivation may be made to produce as much as one hundred trees of equal kind and size in the single system, if the distance between trees is as I have stated. The quality of the product is generally much better also.

The wise cultivator never allows the olive tree to develop lateral branches until five feet from the ground, thus concentrating all the vigor in the trunk of the plant. With the aid of good fertilizers, he thus succeeds to develop in a few years an olive tree almost as large as a prune tree of the same age.

Four or five feet from the ground he allows the formation of lateral branches. At this stage, when the winter is over, he cuts the guide or central part of the plant, leaving the trunk with only three lateral branches. The wounds are most carefully bound with the asphaltum paste mentioned. From the three branches other lateral branches are soon developed, and the tree assumes a convenient form for the greatest production.

FERTILIZATION AND CARE.

In cold localities fertilizers are applied in the fall; in warm places the application is made in spring time. A yearly contribution is necessary for a large and fine crop of olives. Good and deep soil is not excepted, although poor soil needs it the most. The very best method of fertilizing is by excavating the soil around the roots, but not quite to their surface; applying then the fertilizer well mixed with soil, covering it immediately. The next best method is by making holes fifteen or eighteen inches deep, four or five feet from the trunk of the olive, applying the fertilizer and covering it. The greatest care is taken to never allow the fertilizer to come in contact with

the roots of the plant, for it would then be of injury rather than of benefit as food. The quantity of fertilizer used is according to its quality and the size of the plant. In steep soil the fertilizer is invariably applied only on the upper side, for the filtration of winter rains will provide for the lower part of the ground.

Plants not propagated by the seed method develop their root-system in a horizontal direction and toward the surface of the soil. This is the cause of their inferiority and also the cause of rendering slow and dangerous the work of fertilizing them. The spade is the proper instrument to use. The plow is most dangerous. The inventor of the plow and the discoverer of America were certainly the greatest benefactors of mankind, and yet—ingratitude of man!—the memory of one is lost in the dim of ages and the memory of the other is only revered by a few. But the plow should never be applied around the roots of the olive, if success is desired. The noble tree is very modest. It only requires of you to be kept free from its enemy, the vegetation growing under its branches, robbing the roots of their food.

Nearly all chemical fertilizers are injurious. When they are applied in a concentrated state, they only serve the purpose of diseasing and killing the olive. The best of all fertilizers is that which combines in itself all the virtues of air and soil. The best results are obtained with manure of cows, horses, mules, sheep, poultry, and the refuse of wool and of tanneries, and from the product of the outhouse.

Some producers have a very ingenious and efficacious way of fertilizing. They put thirty or forty chickens in a large cage with a false bottom, leaving the cage two or three days under a tree, then transferring it under another tree, and so on. The manure is spaded in the soil as soon as possible, with an excellent result in the olive crop.

A family with a cow and a horse kept in the stable, in the course of the year will have enough fertilizers for eight hundred trees. This, however, is not as good as the chicken or sheep manure, particularly if not immediately used. Refuse of wool and of tanneries give surprising results, if moderately used and applied well mixed with soil. But the king of fertilizers is that of the outhouse. I am sorry to make mention of this at this time, being a delicate subject to speak of, but the splendid purple mantle of popes, kings, and emperors, which receives the homages of multitudes, and the luscious satin which gives an angel-like aspect to your fortunate and beautiful women, originated from a substance no less vile and revolting to our senses.

An ordinary family will produce enough during the year to fertilize seven hundred large olive trees. The application is made most efficacious by making holes eight or ten inches from the stump, in the bottom of which straw is used for impeding the percolation, covering the holes as soon as possible, in order to arrest evaporation. Trees thus treated soon distinguish themselves from others for vigor and freshness, for abundance and fineness of crop, for resistance to parasitic insects.

PRUNING AND ANNUAL CROP.

Pruning is the most difficult part of olive culture. It is from it that depends a large annual crop, instead of a biennial one. It is from it that mostly depends the health and general welfare of the plant. The pruner is either the wise doctor or the quack of the family. It is a grave error to suppose that the olive produces in proportion to its branches or foliage. It is the very reverse. It is equally erroneous to believe that an annual crop cannot be had from the olive. It was so a long time ago, but not now,

wherever the plant is properly treated, as I am about to indicate. It is not the quantity, but the quality, that counts. It is not every husband that knows how to appreciate a loving, self-sacrificing, God-sent wife. It is not every pruner that knows the virtue and capacity of each branch. And yet how easily the thing can be learned by observation!

The olive has two kinds of foliage—the one formed last year, which will produce this year, and the one formed this spring, which will produce next year. It has also two kinds of buds, easily recognized by their round form and diamond-shaped points; one will bloom, the other will produce leaves. If in pruning yearly you equalize proportionally the fruiting and the wooding buds, your success for an excellent crop is assured. The result is almost astonishing, if you feed the tree with a good fertilizer, and soften the ground under the branches at least thrice a year.

The greatest success, however, is obtained by pruning the tree as soon as its berries begin to ripen. While pruning, the shaking of the tree will effect another good purpose. The damaged berries, by their weak nature, will fall to the ground, thus insuring a good oil out of the crop without further labor or trouble, and the sap, on account of the wounds caused by the pruner, rushes to increase the volume and the value of the sound berries; while the plant becomes from this time on well prepared for another large crop in the following year.

The greatest care, however, is put in covering all cuts made during the operation of pruning with a paste made of one part of clay and two of cow dung, tempered with water. It causes a prompt formation of the bark on the affected parts.

Another method for increasing the annual crop is gradually gaining ground, with a most wonderful result. It consists, besides pruning, in depriving at the same time the plant of all branches containing less than five leaves. The tree in the following season covers itself with large clusters of olives to such an extent that a support is often necessary.

In pruning are cut down, besides all dead and damaged wood, all shoots with a vertical growth, and all branches covered with vigorous leaves, for they are the black sheep of the family, thus promoting the possible fecundity of the plant. Old branches with sparse leaves are the greatest producers.

All cuts must be made cleanly, and possibly by a single stroke, with an inclined not horizontal direction, and healed with the last named paste.

DISEASES AND INSECTS.

The olive, as proven by its wonderful average of duration, is the healthiest of fruit trees. Like all things mortal, however, it is subject to some diseases and insects, if the laws of its nature are not properly observed. The principal diseases developed in Italy are the following: The worst of all is a necrosis, or rottening of the plant. It begins on the surface of the bark, proceeding internally. Its development is due to wounds not properly cured, as in grafting or pruning. It attacks trees on damp soil only. The only remedy, if taken in time, is to cut the rotten part, healing it with coal tar.

The black scale, deriving from *fumage oleæ*, is caused by dampness, by a deficiency of the elements of the plant in the soil, by want of sufficient light and space for the tree. Wherever none of these three things are wanting, the black scale, so dreaded and devastating in California, never shows itself, at least in Italy. And wherever it appears its damage is unnoticed, if there are antiparasitic birds of tender beak.

The *agaricus melleus* is a whitish filament, which develops itself under the bark of the trunk and roots below the soil line. The same disease is noticed in vines. It is a consumption of the plant. The only remedy, if applied in time, is to excavate the soil, rub off the bark, leaving the affected part exposed to the sun rays for a few days before returning to its place the soil excavated.

The most damaging of all insects in Italy is the *dacus oleæ*, or olive fly, the female of which deposits an egg on each berry. Forty-five days after, the egg develops itself into a larva, which digs a hole in the berry and around the pit. In about thirty days the destruction of the pulp of the fruit is nearly completed. At this period the larva leaves its place, descending to the crevices of the bark of the tree, or in the soil underneath, where it is transformed into a chrysalis. Four weeks after, deprived of its skin, it returns to the open air a perfect insect, provided with wings and organs of reproduction.

Olives affected by said fly will rancidize the oil in a very short time. Luckily the fruit so damaged is the very first to fall to the ground in shaking the tree, as stated. The new method of pruning and of cultivation, and the picking of the berries as soon as they are ripe, tend also to check the propagation of the damaging fly, for the destruction of which many were the means adopted, but none proved so cheap and effective as insect birds.

There are other insects more or less damaging to the olive culturist, but birds save his crops; they are his best and most faithful friends wherever protected. Insect pests increase or diminish in proportion to the protection accorded to antiparasitic birds. It is certainly not creditable to man, the fact that he is perhaps the only being who destroys his benefactors.

You have undoubtedly heard of the case of Frederick the Great of Prussia. His gluttony had gone so far as to fear the cherries of his dominions would be all destroyed by sparrow birds. He conceived their destruction. He ordered every farmer to bring at least twelve sparrows yearly to him. It was a big job, but the destruction was far from being accomplished. He then put a premium on every sparrow brought, dead or alive, to his law executors. The destruction was soon complete. The glutton's joy, however, was brief. Insects and worms had invaded fields and orchards, destroying, besides, cherries, fruits, grain, and vegetables of all kinds. The monarch concluded that the exiled birds were wiser than his wrath was, and he called them back and passed laws for their protection.

Birds of tender beak, such as the woodpecker, the branchpecker, and the blessed *cingallegra* of Italy, are of immense benefit in orchards. The ancient Romans, in their great pagan wisdom, protected with severe laws insect birds of tender beak. If you put a cingallegra on a fruit tree affected by insects and worms, they will soon disappear, eggs and all. If you watch the little greenish and blackish benefactor in its diligent and rapid operations, no more coal oil, potash, soapsuds, or other washes will trouble your mind and pocket.

Antiparasitic or insectivorous birds have been tried over and over again in Italy, but never with any degree of satisfaction. Bad insects have been found to be more numerous and of greater fecundity than their enemies.

The idea that birds propagate fruit diseases and insects in their flight is exceedingly erroneous. The same may be said as to their damage to fruit. Birds of tender beak should be used, and no other. Birds of this kind resort to fruit eating only when there is no insect food to be had. Exceptions are not the rule. On the other hand, when a man brings to us a dozen pears, we should be generous enough to allow him to eat one of them.

If the bird saves our crops from a partial or total destruction, we should not be so selfish as to pretend that he should starve.

Aves multiplicentur is as good a saying to-day as in the time of Virgil. Multiply, protect insect birds, and all your anxiety, all your troubles and expenses about fruit pests will soon disappear and many million dollars be added annually to the commonwealth.

OLIVE PICKING.

The olive is ripe when it assumes a dark purple or dark brown color, according to its variety. If picked before it is fully ripe, the oil will have a greenish color and a bitter tendency. If the picking is delayed a month after maturity, the oil will be four or five per cent more abundant, but of that much inferior quality. The best oil is the one made soon after the picking of a seasoned fruit.

If the plant is of the *Frantoiano* family, picking is effected easily by hands. If of a larger size, shaking is resorted to. I have already stated how the tree is deprived of its damaged fruit. A repetition of the operation is now made, if necessary. When the damaged berries are down, large blankets are unfolded under the branches, and the tree is vigorously shaken by the picker among the branches. The ripe fruit is soon down, without the least injury to the foliage of the plant. The fruit thus obtained is generally free of leaves or other impurities; but if necessary a powerful hand bellows or fan is used while the berries are on the blanket.

The olives are brought into a preserving room, the temperature of which is kept from 55 degrees to 63 degrees Fahrenheit. If they are wet, they are dried gradually at the same temperature, on blankets. If the temperature of the room is above 63 degrees, the oil will be of inferior quality. The olives in the preserving room are so disposed as to permit a free circulation of air through them, preventing heat and fermentation. In this way, and at such a temperature, they may be kept two weeks without the least injury; the sooner, however, the oil is made the better.

The fruit of the finest varieties of trees is kept separate from coarse varieties. The valley and hill fruit is never put together in good oileries, for hill oil is invariably the finest.

OIL MAKING.

Unless the crop is large enough to go into thousands of gallons, a simple and cheap stone mill, turned by a horse, and a hand press is all the machinery required. For greater quantity of oil water or steam power is necessary, but the principle of the crushing mill and press is the same.

The crushing machine consists of a circular trough, the top of which, made of granite or slate slabs, assumes the form of a dish. A millstone, eight or ten inches thick and four feet in diameter, is made to revolve in the trough by a vertical beam. The crushing stone is so arranged as to be raised a few inches from the trough or lowered at will. The olives are brought in from the preserving room, laid in the trough about three inches thick, and the stone is set in motion.

If you want virgin or first class oil, you must raise the stone so as to not permit the least cracking of the pits, or your oil will never rank as virgin. Several turns of the stone, and your olives are bruised enough for the press.

The temperature of the crushing and press room must be kept the same as that of the preserving room. If cooler, the oil will be less and it will

not easily clarify by itself. If warmer, the oil will soon deteriorate, if not pass into rancidity.

The only danger to which pure olive oil of all grades is subject is the contact of air at a temperature above 63 degrees. Out of the contact of air it will stand almost any amount of heat without altering. It is thus understood that frequent changes of weather are also injurious, if the oil is not kept in air-tight vessels.

The bruised olives are taken from the trough and rapidly put in cages or sacks, shaped like a California cheese weighing twenty-five or thirty pounds, made of a seaweed, known to botanists as *Juncus acutus*—a most excellent material for the purpose.

From five to eight of these cages are piled in a press on top of each other, with a metallic disk, generally of copper or galvanized iron, between each cage. The press is very similar to the one used in this country for cider making.

If it is of hard wood exclusively, the press gives better results than when it is made of iron or steel. Metal generates heat easier than wood, and heat is always most injurious to oil. For the same reason olives in the trough are never laid thicker than three inches, and the crushing stone is never made to revolve more than six times per minute, although much less liable to become heated by friction than iron. The use of iron rollers in olive crushing, as now practiced in California, has been tried long ago also in Italy, but it was soon discarded as absolutely contrary to the production of fine oil.

Several twists are gradually given to the screw of the press, and the almost colorless virgin oil streams down to the bed of the press, from where it runs into a vessel. When the flow begins to diminish another twist is given to the screw. As soon as a change of color is observed in the oil, the flow is stopped by a sudden unscrewing of the press.

The olive paste is taken from the cages and returned to the trough. The millstone is lowered to its bed and a perfect crushing now ensues. The paste is again pressed, gradually but energetically, and the oil is left to flow until it stops by itself. This is a beautiful straw colored oil, universally esteemed, although only of second quality.

The pressed paste is again put under the crushing stone, but this time moistened with water heated 80 degrees, or, better still, moistened with wine vinegar. The resultant oil, naturally deteriorated by the temperature of the water or by the strength of the vinegar, is of third quality, but the untrained palate is apt to take it as a much finer oil. When, however, the temperature of the water used is above 80 degrees, the oil is not fit for food on account of its disagreeable taste. In such cases the oil is generally made tolerably good by washing it several times in first-class wine vinegar.

At this stage of the process, the oil is far from being all extracted from the remaining paste. It is, however, beyond the power of the common producer to proceed further in the extraction. It is here that ingenuity and capital step in for their share of profit.

The Yankees are no longer the only wonderful people in the world. They are getting civilized in Italy as anywhere else. Unfortunately for the dime-novelists and over-sentimental young ladies, they have no more brigands in that country, unless they be cowboys as we have on this continent. If the clever Yankee can sell corner lots in an unborn city, or get good whisky out of sulphuric acid; if the patient German can get good beer out of bean stalks; if the obliging Frenchman can get good cognac out of potato-roots, the hot-blooded Italian is cool enough to get more oil out of the olive than any other man.

The producer sells to the oil extracter all the remaining paste for a share of the oil to be extracted from it, or for cash. The extracter has a large establishment or oil factory, conveniently located in the center of an oil district, well provided with a twenty or twenty-five-inch stream of the purest water. By further triturating the paste with comb-shaped machines, by forcing its passage into a large number of peculiarly formed tanks by small troughs and falls regulated like a clockwork, the extracter succeeds in getting a fourth, a fifth, a sixth, and a seventh grade oil, which makes him a millionaire in a few years.

Some of these establishments cover an area of acres, employ hundreds of workmen, and have nearly a mile of troughs and falls. I will not attempt a description of the process. It would require a longer paper than this, and the olive culture in California is yet far off from the day when the system may be needed. As it might be supposed, the olive extracted, particularly the last three grades, is of a very repulsive smell and taste, but the ingenuity of the extracter is equal to the emergency. Vinegar and kaolin are his principal agents. By successive washes he succeeds in making the largest portion of his oil as good and acceptable for food as the third quality of the original producer. The rest is treated with solvents, and go for lubricating and soap-making purposes.

Oil of all grades is left to clarify in large vessels of terra cotta, well glazed inside, with an air-tight cover. In three weeks, if the temperature is kept as indicated, the clarification is generally perfect. The oil is then transferred into large tanks made of glass plates, immured in solid masonry, for keeping, where it may remain three years without the least deterioration, although age never improves it.

The greatest cleanliness is necessarily observed. All dangers of rancidity are thus removed.

When the oil is wanted for immediate use, clarification is effected by filters containing cotton and charcoal.

As I have already stated, the quantity of oil in the olive varies according to the quality and age of the tree, its location, treatment, season, etc. The annual average, however, is considered, for the very best varieties, 12 to 15 per cent of virgin oil, 5 to 9 per cent of second, and 4 to 6 per cent of third quality. To these figures must be added the amount taken by the extractor, which usually runs from 11 to 18 per cent.

It is thus really surprising the amount of oil incased in an olive of choice variety. The oil is not located all in the pulp of the fruit. If microscopically examined the pit reveals a part of it. The kernel is nearly all reduced to oil; an average of 5 to 8 per cent of oil may be extracted from them; they are the vital part of the olive, and as such their oil is the very first to be affected by the contact of heat and air.

PRESERVED AND PICKLED OLIVES.

The ripe berries of first class trees are almost sweet, but for preserving purposes they are deprived of all bitterness by maceration in pure water at a temperature of 55 to 60 degrees, changing the water frequently. They are then dried at the same temperature, and packed in boxes or cans for market. Thus prepared they keep in a perfect condition for years, and are fit for gods as for man.

When picked green they are treated with weak lye at the same temperature, rinsed in fresh water several times, and bottled or canned in brine.

INFLUENCE OF TEMPERATURE.

You have been told by all sorts of authorities that the oil of the south is not as good as the oil of the north. This is only partially true. As already intimated, temperature is a most wonderful agent; the same plant, the same temperature of elevation, the same system of treatment, the same degree in the preserving and in the crushing room produces an identical oil in the south as in the north. The olive is never influenced by the soil as much as the vine is. It is the proper application of temperature that makes to-day, all things being equal, the oil of Riviera, Umbria, Apulia, Sicily, in fact of all olive districts of Italy, as fine and appreciated as the deservedly celebrated Lucca.

PROFIT OF OLIVE CULTURE.

The oil market in Italy is rarely affected by the amount of the crop. The barometer of quotations is the quality, not the quantity. Virgin is quoted, on an average, from $1 80 to $2 10 per gallon; of second quality, $1 25 to $1 75; of inferior trees, $1 to $1 15; third quality, 85 cents to $1; refined oils, about the same price.

The average value of the crop of the best varieties is considered as follows: Each tree, at ten years, $3 50 per annum; at sixteen, $5 50; at twenty, $7 50; at thirty, $13; at forty, $18; at fifty, $24. There are certainly a great many exceptions below and above—trees that produce only five gallons of berries, and trees that go as high as three hundred gallons; but such are the calculations of competent agronomists.

It is thus seen what a blessing an olive plantation of seven hundred or eight hundred trees is for a family and its posterity. It may seem a small thing to you, accustomed, as you are, to broad acres; but in Italy they constitute almost the only happy patrimony of thousands of wealthy families.

SAMPLES.

You have invited me, Mr. President, as you have already stated at the opening of this convention, to bring samples of oil and olives of Italy, to be compared with the corresponding product of California. You were so kind as to state in your invitation, for my guidance, that the picking of your samples of olives would have taken place on the fifteenth of October. Although this was a marked disadvantage for Italy's product, because in that country, as I have stated, the olives, as other fruit, does not mature as early as in California, and, consequently, could not be as fully developed as your olives of the same date, I accepted, and left no stone unturned, I assure you, to bring before this body, at a cost of over $100, samples of oil, and all kinds of olives mentioned by me, from nearly every oil district of Italy.

Unfortunately, my request, for reasons yet unknown to me, was not fully complied with, and the samples delayed on the way. Besides, they were neglectfully forwarded without the proper bill of lading or the necessary consular certificate as to their value, and there was another delay in New York, where they arrived on the fifth instant. There was no possibility, by the time I received the notification on the fourteenth instant, of having them in time for this convention, and I was thus compelled to come, in order to not fail to my promise, without the samples. As a proof of my earnestness I can only beg the permission to present for your examination the letters of the managers of the European-American Express in Havre and New York, referring to the subject.

I have, however, brought here two samples of oil, first and second grade, a sample of preserved and a sample of dry olives, taken from the sample room of the Italian Chamber of Commerce of San Francisco. As a curiosity I also brought a sample of seed of the *Gremignolo*, known in Italy as the fog-proof olive.

The dry olives are the berries of the precious *Frantoiano*, the smallest of olive trees.

The preserved olives are the berries of the no less precious *Capraino*. Like all the best Italian varieties, it is a very sweet olive. In size it ranks only third, the *Lucca* being much larger, and the *Giuliana* at least three times as much.

The oil is from the *Taggiasco* variety. It is not considered the finest, but it is a fine oil.

If these samples, though not as choice as those I intended to present, will be found, as I trust, superior in flavor, in fineness, sweeter in taste and lighter in weight than the corresponding California product, and if it will be so decided, Mr. President, ladies and gentlemen of the convention, nothing in the world will be gained by me, but it will be a further credit to your intelligence and taste, and, as a compensation of all my trouble and expenses, I shall deem to have rendered an act of justice to the products of the beautiful land of my fathers and a useful service to this the beautiful land of my children.

Mr. Johnston: I move that the thanks of this convention be tendered to Mr. Dondero for his very able and exhaustive essay on the olive.

Carried.

THE OLIVE IN CALIFORNIA.

Essay by B. M. Lelong, Secretary.

FOREIGN VARIETIES OF OLIVES, VARIETIES, BUDDING AND GRAFTING SYSTEMS, NEW AND IMPROVED METHODS, AND GENERAL OBSERVATIONS AT HOME AND ABROAD.

The olive is now more prominently before the people of this State than any other tree. The merits of the varieties most largely planted have been widely discussed through the columns of the press; only two varieties having received attention, this being due to the fact that very little has been known of other introduced varieties that have recently came into bearing. I have within the past year given this matter a great deal of attention, and have spared no pains in investigating anything in the olive line that has been made known to me; although this task has been somewhat difficult to fulfill, having so many duties to perform.

The adulterated olive oil question remains the same. I hope you will pass such resolutions as you may deem proper, giving the State Board of Horticulture authority to ask the Legislature for the passage of a bill to prevent the sale of adulterated olive oil, and further, that every label on bottles of California olive oil, or on bottles of olive oil offered for sale as such, to bear the name of the producer and the locality in which it is made, as a guarantee as to its purity and California origin. This industry

is, as yet, very young, and must be protected. The production of olive oil has not been large, and notwithstanding the fact that the producers of pure California olive oil are but few (and their brands well known), there are in this State over thirty brands purporting to have been produced in this State, while the *producers* number less than a dozen. The injury is not at our home market, but in the East, where people suppose, when they buy these brands that they really get what the label bears "pure California olive oil," only 50 cents a bottle; per gallon, $1.

Appended hereto is a translation from the "Annals" of the National School of Agriculture of Montpellier, France. The description therein given of the varieties of olives in general cultivation there is the most reliable information obtainable, and as many of these varieties are now beginning to fruit in this State, their qualities should be known.

Picholine.*

(Figure No. 1, Plate I.)

Synonymes.—Pichouline, Pecholine, Pijouline (Languedoc). Saurine, *Rozier* (Nimes). Sausen, Saugen, Sauzin (Gard). Saurenque (Aix) Plant de Saurin, Saurine punchudo (Marseille). Piquotte, Piquette (Beziers). Coiasse ou collasse, *Reynaud.* Lacques batarde (quelques localities de l'Herault). Olivo lechin, *Tablada.* Pignola, Duhamel (Genes). Olea ovalis, Clemente. Olea europaea saurina, *Risso.* Olea europaea oblonga, *Gouan.* Olea frustu oblongo minore, *Tournefort.* Olea minor oblonga, *Magnol.*

DESCRIPTION.

Tree is of vigorous growth, but of average dimensions; its trunk is cylindrical; its bark is easily detached from the trunk in large, irregular layers; its branches extend horizontally and are of slight build; the rejection of its leaves are not numerous.

Branches not very vigorous, short, strong, inserting themselves at right angles; of a greenish, yellowish color; near the bark of a rugged nature covered with numerous protuberances which are quite visible; wood cylindrical and flattened slightly; knots few in number.

Leaves oval, lance shaped, very often enlarging themselves at the superior part; of average length; average length five and a half to six and a half centim. Width one and a quarter to one and a half centim. Top surface of a dark green color; bottom surface approaching end of leaf rather thick and of a soiled white color. Stem very thick, hard, breaking easily.

Veins, very visible from bottom.

Stem, short, very thick, very much curved toward the surface of the upper side of leaf.

Leaf Stalk, large, long, but little contorted. The leaf perceptibly flat, the edges of which are not very much curled. The leaves accumulating in great numbers on the young branches, covering them thickly.

Fruits, generally accumulating in the direction of the branches of the year (yearly branches), isolated or grouped by twos on the leaf; stalklet very short.

Fruit Stalk, very large, short, inserting themselves in a rather large depression of the fruit. Stigmate persistent in an umbilic not very visible.

Olive, a trifle below the average size, length two and one half to three centim., width one to one and one fourth centim. Of elongated form, but large near the fruit stalk, with a tendency of tapering itself towards the

*A variety believed to be the Picholine is fruiting in several parts of the State under one of its synonymes of Oblonga.

point; rather symmetrical. Strongly fortified on one side at a point not attached. Intermediate form between varieties Oliviere and Lucques. The fruit changes (passes) in color from light green to wine red, then to red black. The surface carries a number of spots, specks, variegations sufficiently visible. Little like a plum.

Skin, fine, pulp abundant, of a dark red color, fleshy.

Kernel (pit), small, very elongated, pointed at both extremities, with a more pronounced curvature than is generally found in most olives. Tree of average maturity.

OBSERVATIONS.

The Picholine is widely known (spread) in certain parts of Province, particularly so in the neighborhood of Aix, Tarascon, Marsville. One likewise encounters it again frequently in Languedoc, but only by its name, as it is only a secondary variety there; perhaps also in some localities of the department of Gard. It is a variety yielding a good and regular production, being rather hardy (rustic), it is able to stand severe amputations, to which it has been subjected at Hante Province. It is cultivated sometimes for its oil, but much more often for the purpose of having the fruit picked green, having its commercial value in view as a (pickle) preserve. The Picholine is a very delicate olive, as much prized as the Olive "Verdale" for table use, and which is sold often under the name of "Lucques," but resembling it a little only in form.

Saillern.*

(Figure No. 2, Plate I.)

Synonymes.—Saillerne (Nimes). Sargene. Olea ninor, rotunda, rubro-nigrigans, *Turnefort*, Olea Atro-rubens, *Flor. Monsp.*

DESCRIPTION.

A very hardy tree, middling or tall, spreading out; trunk very big, enlarged at the base; the bark comes off lengthwise in thin strips of blackish color; the main limbs are horizontal or slightly set up; shoots very numerous; it is one of the varieties which put forth the greatest number. Branches pretty vigorous, generally in limited quantity, big, much bulged out at the insertion, of dirty yellow color, longitudinally striated and covered with apparent and pretty numerous freckles; wood decidedly canaliculate; knots little prominent.

Leaf, lanceolate, regular, short, relatively large (mean length six to seven centim., width one and one quarter to one and one half centim.); upper face shining light green, a little wrinkled; under face covered with a dirty white coating pretty abundant. *Limbs* not very thick, flexible; nerves well delineated on upper face. *Mucron* well marked on the wide point of the leaf; hard, short, bent round. *Petiole* big, short, bent over, bringing the leaves upon one another on the same side of the branch.

The leaf is nearly flat, the edges but slightly drawn back. The cover of the tree, little provided with leaves, on the inside is always tolerably thin.

Fruits, for the most time isolated, occasionally grouped in twos, on two-year-old branches. *Peduncle* long (fruits hanging down), inserted in a light depression of the fruit; stigma persistent in a well marked umbilic.

*Fruited in this State this year under one of its synonymes of Atro-Rubens.

Fig. No. 1.—Picholine.

Fig. No. 2.—Saillern.

Fig. No. 3.—Rouget.

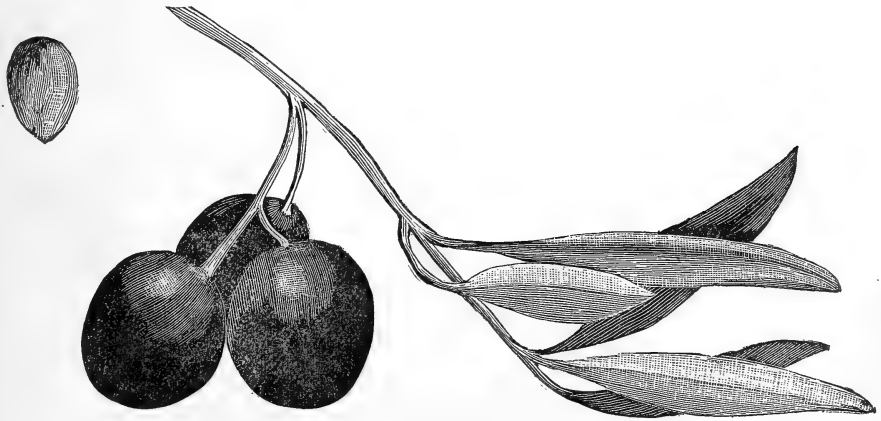

Fig. No. 4.—Verdale.

Fig. No. 5.—Oliviere.

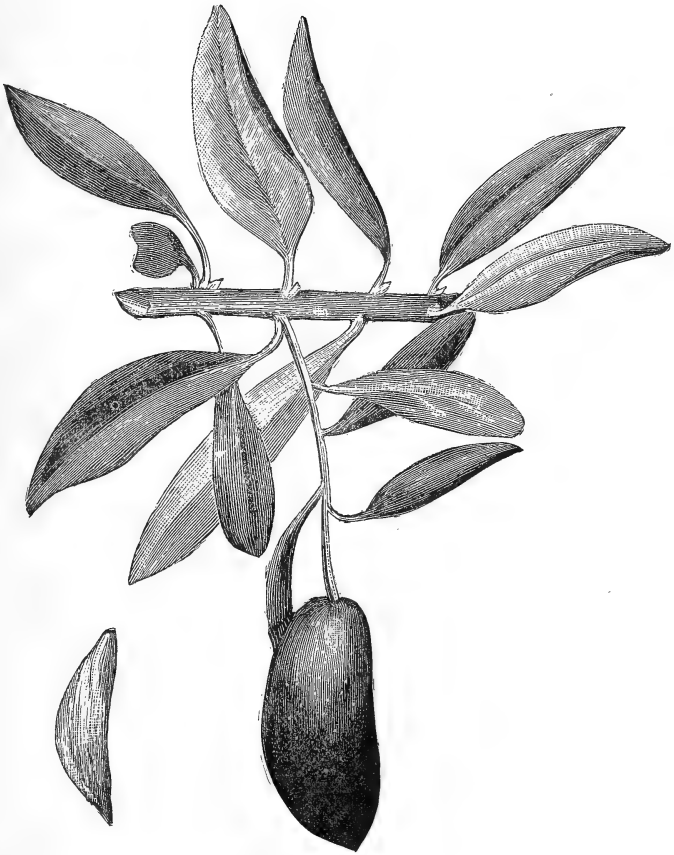

Fig. No. 6.—Lucques.

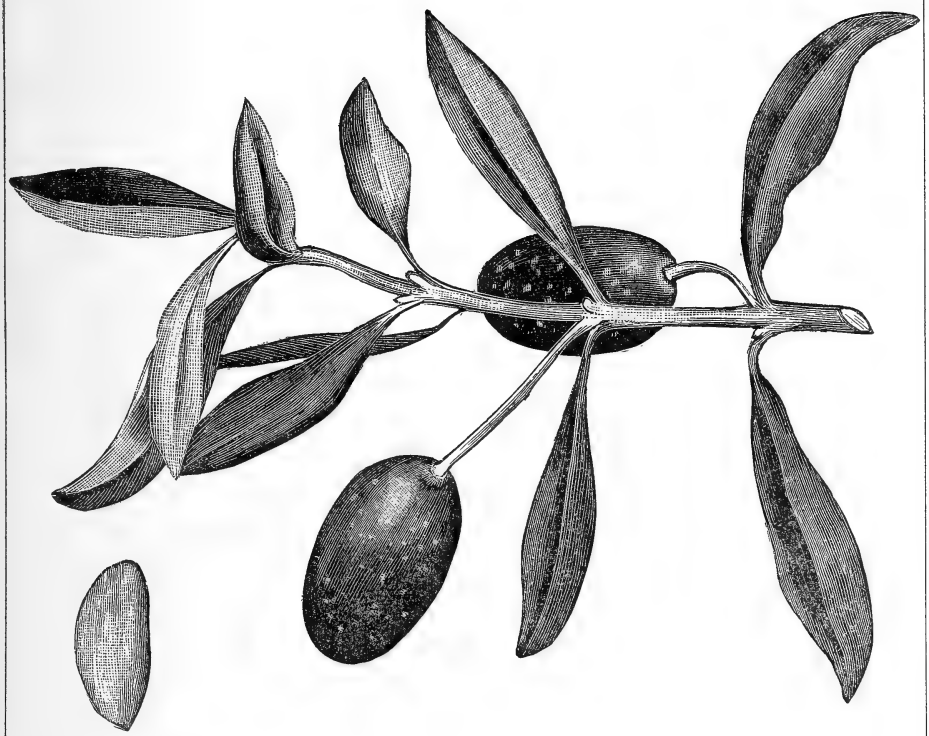

Fig. No. 7.—Pigale.

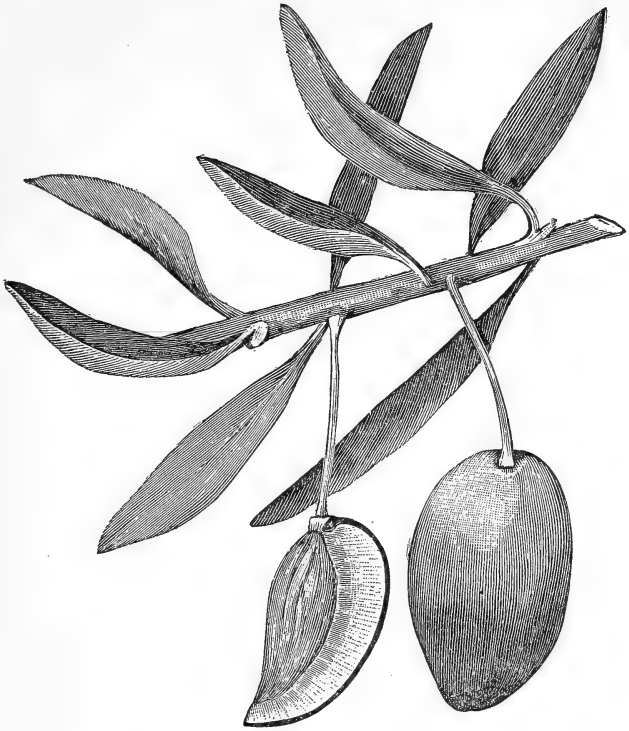

Fig. No. 8.—Pendoulier.

Fig. No. 9.—Manzanillo.

Fig. No. 10.—Rubra.

Fig. No. 11.—Macrocarpa.

Fig. No. 12.—Uvaria.

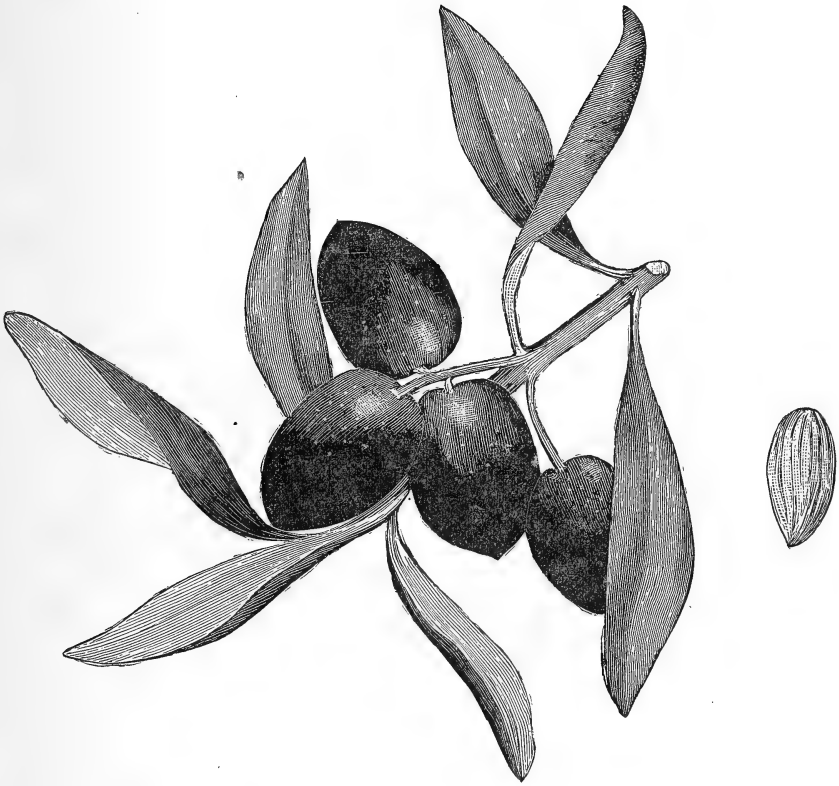

Fig. No. 13.—Atro-vialacea.

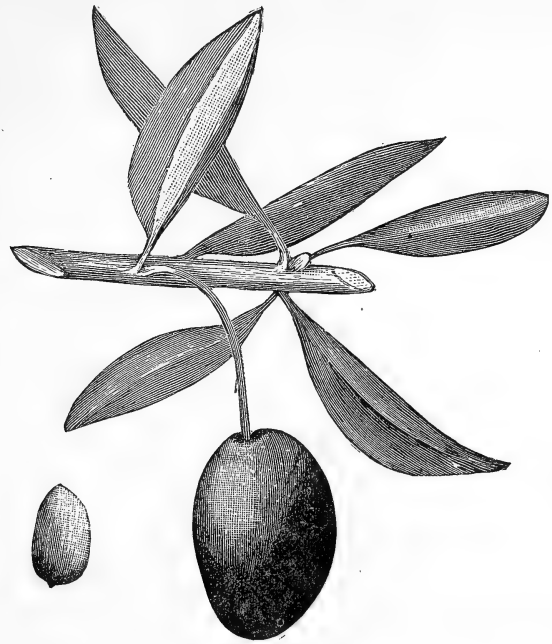

Fig. No. 14.—Pendulina.

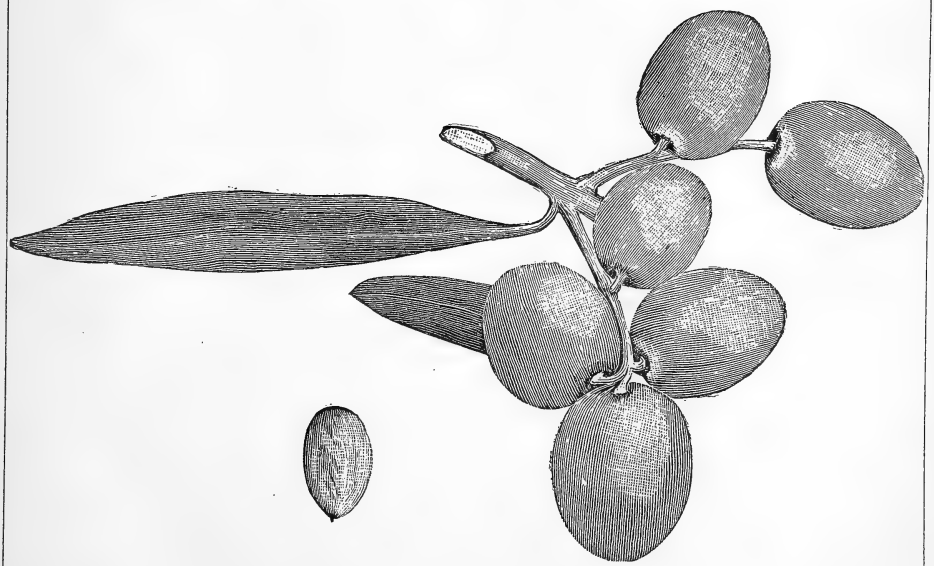

Fig. No. 15.—Columella.

FIG. No. 18.—Redding Picholine. (Cal.)
(Natural size.)

FIG. No. 17.—Redding Picholine. (Cal.)
(Natural size.)

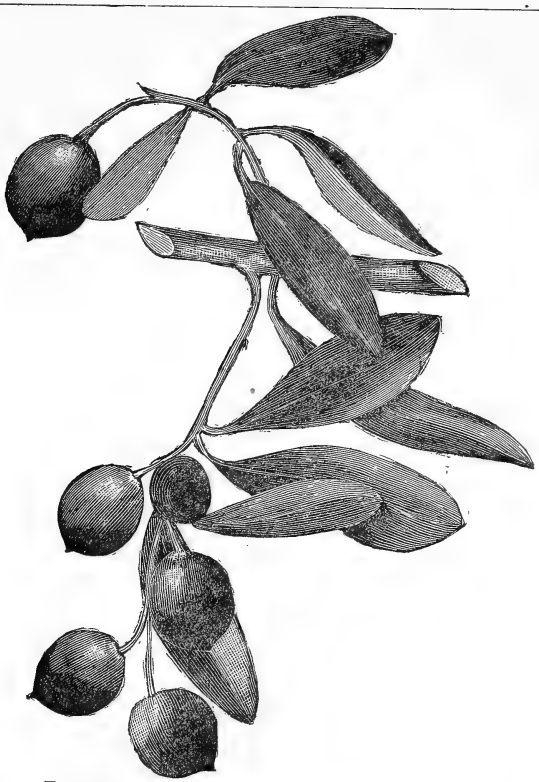

FIG. No. 16.—Redding Picholine. (Cal.)

FIG. No. 19.—Mission.

FIG. No. 20.—Mission, showing size of pit and flesh.

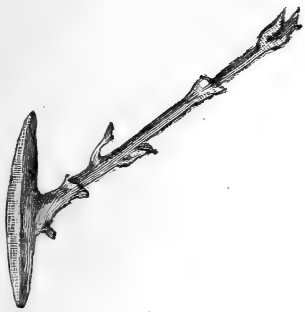

Fig. No. 22.—Twig Bud.

Fig. No. 23.—Small Twig Bud.

Fig. No. 21.—The Scion.

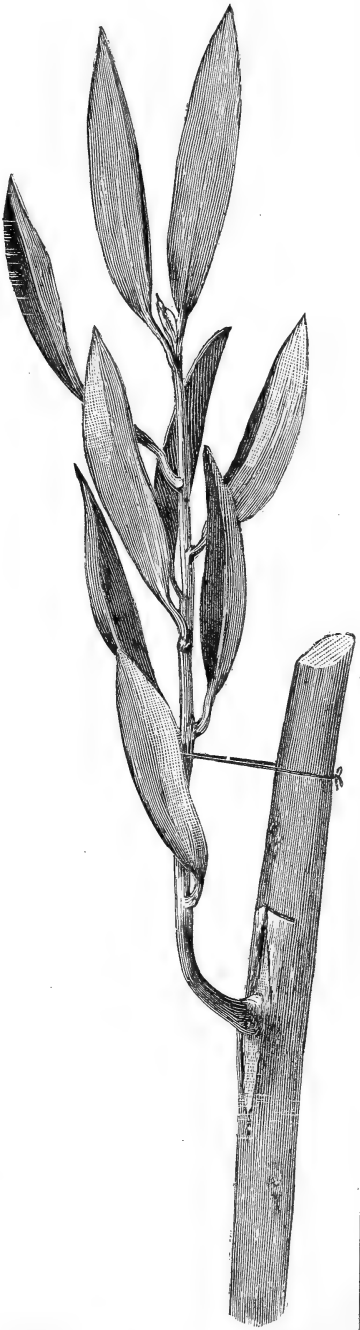

Fig. No. 24.—Started Bud, trained.

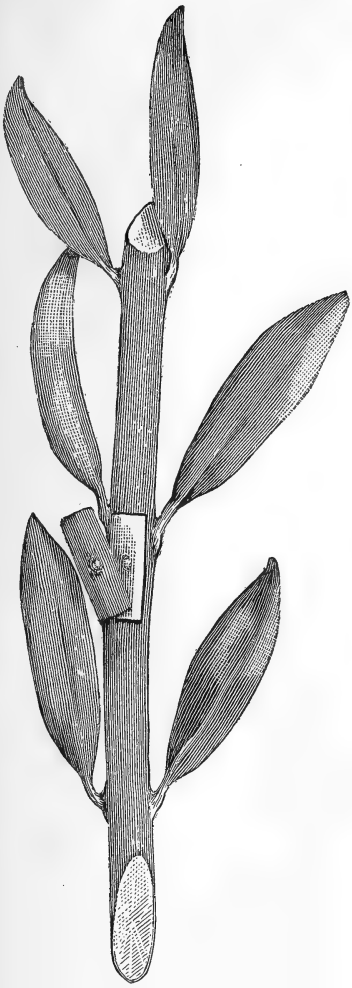

Fig. No. 25.

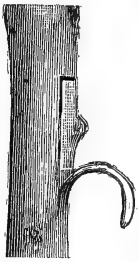

Fig. No. 26.

Fig. No. 27.

Fig. No. 28.

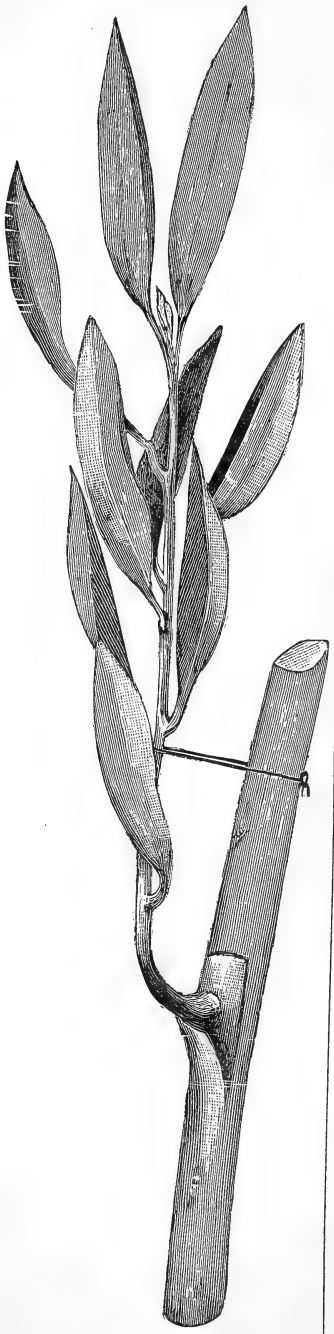

Fig. No. 29.

Fig. No. 25.—Scion.
Fig. No. 26.—New method, bud inserted.
Fig. No. 27.—Bud inserted, front view.
Fig. No. 28.—Improved method, both ends covered.
Fig. No. 29.—Started bud, trained

FIG. No. 32.—Graft and Stock, new method.

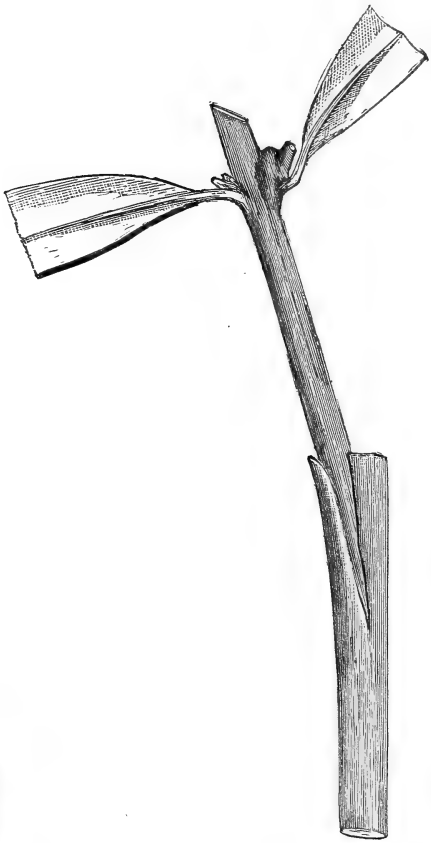

FIG. No. 31.—Cleft Graft inserted.

FIG. No. 34.—Graft growing.

FIG. No. 33.—Graft inserted.

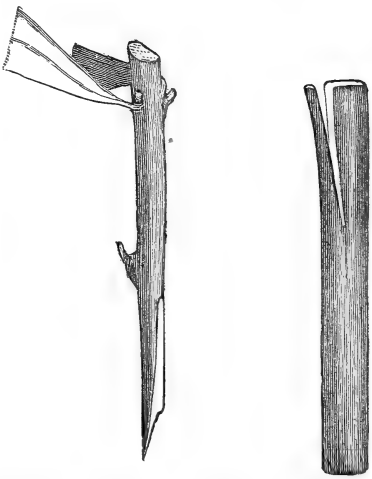

FIG. No. 30—Cleft Graft and Stock.

Olive, pretty small (length, one and one half to two centim., width, one to one and one quarter centim.), nearly ovoid, a trifle oblong, slightly bulged out on one side. The fruit is deep black when ripe and very hoary; skin thin; pulp not abundant nor fleshy, juicy, colored a deep vinous red; pit big, of same form as the olive; tree of middling maturity.

OBSERVATIONS.

The *Saillern* is pretty much cultivated in Province, principally about *Aix*, and in *Languedoc*.

It is a delicate tree, sensitive to cold, and consequently not many old plantations of this kind can be found. It is nevertheless a meritorious variety, especially on account of the excellent quality of its oil. It brings out fair crops, bears most every year, and deserves to be planted in the situations and localities where the winters are never very severe. The *Saillern* is almost exclusively grown for the sake of its oil.

Rouget.*

(Figure No. 3, Plate II.)

Synonymes.—Rougette (Montpellier, Beaucaire). Rousseoun (Avignon); Marveilletto (Manosque). Pigau or Rougette, Laure (Bouches-du-rhone). Vermillau (Gard), (?) Caillose, Cayonne, Rougeolle (Toulon). Olea rubicans (Rozier).

DESCRIPTION.

This tree is hardy, half erect, and a rapid grower under favorable circumstances; trunk cylindrical, canaliculate; bark blackish gray, wrinkled; the main limbs are either horizontal or upright; the forms of a vase or a ball are the most favorable to its development; shoots very numerous.

Branches, numerous, even on the old wood, hardy, long, thin, horizontal or semi-erect, of a dull gray, wrinkled, covered with many small, regularly distributed freckles; wood irregularly furrowed, even on old branches; knots prominent.

Leaf, lanceolate, pretty short, large (mean length five and one half to six and one half centim., width one to one and one fourth centim.); upper face deep green, with pretty numerous punctures stamped on the edges; under slightly coated, greenish white; limbs thick, with edges slightly drawn back; nerves little marked on both faces; mucron tender, little prominent, but well defined in the plane of the leaf.

Petiole, short, very thick. The leaves are very numerous and the cover thick, of deep color; inserted perpendicularly on the branches, the leaves present out their upper face; the result is that the tree is of a deep hue, and can be recognized readily at a distance.

Fruits, distributed on the whole length of the two-year old branches, more numerous at the base; isolated or in groups of two, three, or four.

Peduncle, pretty long, big enough, entering into a shallow depression; stigma little apparent. Olive under middle size or small (length one and one half to two centim., width one to one and one fourth centim.), ovoid in form, narrowed in towards both ends; the fruit remains light red for a long time, then turns to a reddish black; some olives remain red till the general ripens, hence its characteristic name of *Rouget*. It is speckled

*Fruited this year under one of its synonymes of Cayonne.

with pretty numerous dots well marked on the red or reddish background; not very hoary; fruit rather shiny; skin pretty thick; pulp fleshy, colored by an abundant vinous red juice; pit middling or small, of elongated ovoid form; very late variety.

OBSERVATIONS.

The *Rouget* is altogether a very hardy variety, and very precious for propagation in poor land. It thrives in the *garrigue* (waste lands) soils of *Herault* even in the midst of calcareous rocks, where it would seem no vegetation could exist. Under such very unfavorable conditions the *Rouget* develops to a satisfactory size, and bears regular crops. In the *garrigues*, covered by a layer of mellow land more or less gravelly, the *Rouget* bears most every year, and abundantly. The frosts of the very severest winters have spared this variety, and very important plantations can easily be found, the age of which certainly exceed two hundred years on an average. It had multiplied greatly in Languedoc before the development of vineyards. The *Rouget* yields an oil of fair quality. A great quantity of this olive is consumed in the form of pickles. For the latter use they are gathered up when yet reddish.

VERDALE.*

(Figure No. 4, Plate II.)

SYNONYMES.—Verdaou, Verdau, Vereau, Aventurier (Frejus). Calassen (Lorgues, Var.). Olea veridula, Gouan, Flor. Monsp. Olea media rotunda viridia, *Tournefort.* Olivo verdago, Tablada.

DESCRIPTION.

This tree is of dwarf habit, half erect and has little vigor; trunk thin, short, conical, canaliculate, with bark rough and greenish gray; branches slightly drooping, principally those at the top of the tree; the tree has the general form of a ball, with a light cover; the roots do not penetrate to a great depth, and the tree is frequently rooted out by strong winds. Shoots scarce, easily grafted.

Branches are not numerous, upright or slightly inclined, inserted at a right angle, of a dirty yellow or light yellowish gray color; freckles scarce and dim; knots pretty prominent.

Leaves, linear, short, very narrow, well characterized by their feeble dimensions. (Length, four to six centim.; width, one half to three quarters centim.)

Nerves, very prominent, of light green; edges drawn back and forming a regular well marked channel. *Mucron* not detached, little prominent, little acute, situated in the plane of the leaf, slightly inclined in the direction of its curvature; upper face dull light green, a little wrinkled; under face dull white; limb of medium thickness; petiole short, thin, bent round so as to bring the upper faces of opposite leaves together; all the leaves are situated in the same plane on the branch, and frequently form with the latter a very acute angle.

The leaves are pretty numerous at the ends of the branches, scarce elsewhere; cover of the tree light.

Fruits isolated, never gathered in great numbers, with peduncle of middling length, thin, dirty green, inserted into a shallow depression; big,

* Fruiting in several parts of this State. At Saratoga it is in bearing on very steep side hills, so steep that they can hardly be cultivated. The trees this year were full of fruit and doing well.

nearly round, slightly truncated at the top, *infun dibuliform* (funnel-shaped); very green till nearly ripe, then of a vinous red, and finally of a deep black, somewhat dull; very hoary at maturity; olive soft, with pretty thick skin; pulp fleshy and little juicy; pit very big, of same form as the olive, with surface but slightly furrowed; very early.

OBSERVATIONS.

The Verdale is much cultivated in Languedoc, notably about *Montpellier*, *Beziers*, and in *Gard*; it is exclusively cultivated in some communes (for instance at Aniane, Herault), where green olives for table use are prepared on a large scale. The Verdale is also found in *Vaucluse* and in *Bouches-du-Rhone*, but not so extensively as in *Languedoc*. It is a very early olive, but little productive of oil; it also rots pretty quickly when fully ripe. On the other hand, the *Verdale* deserves to be propagated when green olives are wanted, for it is a nice olive, generally much appreciated for the table, and is the subject of a very important trade; it must, however, be set out only in good ground, or in ground of medium quality, as its productions fall out in bad soil. The Verdale is pretty sensitive to cold, and the dropping off of the olives frequently diminishes the crop.

Oliviere.

(Figure No. 5, Plate III.)

Synonymes.—Ouliviere, Oulliviere, Oulivieira (Herault). Pointue (Herault); Pounchudo-barralenquo (Provence). Gallinenque, Galinenque. *Rozier, Amoreux* (Languedoc). Liviere, Laurine. *Rozier.* Michelenque. *Amoreux* (Gard). (?) Bouteyenque. *Amoreux* (Beaucaire). Plant d'Aiguieres. *Amoreux* (Marseille). Angelon Sage Reynaud (Gard). (?) Ouana (Roussillon). Olea europaea midia oblonga angulosa *Gouan* Flor. Monsp. Olea europaea laurifolia. Risso. Olea fructu majusculo et oblongo. *Tournefort.*

DESCRIPTION.

This tree is hardy, never of a very large size, and spreads out; trunk cylindrical; bark blackish gray, full of fissures about the trunk and heavier limbs; comes off in short regular strips; the heavy limbs are either horizontal or inclined downward, their many branches falling to the ground; the whole tree looks like a cylinder much broader than high; has usually but few shoots.

The young branches are vigorous, bent round, spirally arranged, and grow out at an acute angle; they change from a clear ashy gray to a blackish gray after the first year; the wood quite quadrangular at the outset becomes cylindrical as the branches grow older; besprinkled with light brown freckles, slightly striated; medium size knots.

Leaves oblong, oval, lanceolate, large to very large (mean length eight to nine centim., ten to eleven centim. in exceptional cases; mean width one and one quarter to one and one half centim. up to two centim. on the hardier stock). Upper face of shining light green; thick, even white coating on lower face; limb thick, with edges much drawn back, forming a channel; nerves only appearing on upper face; mucron long, acute, bent round toward the under face of the leaf; petiole middling, inserted at a very acute angle, especially at the end of the branches where the leaves are habitually accumulating.

The leaves are very numerous, and the cover of the tree thick; they are, besides, drawn up, presenting out their under surface, so that when seen at a distance the tree has a very peculiarly whitish appearance.

Fruits gathered up at the base of two-year old branches; almost exclusively on drooping, seldom on dressed, branches; often in groups of two and three; peduncle long, of middling thickness, entering the fruit in a rather deep depression; stigma little apparent in an umbilic little marked at the point of the fruit; olive of medium size (length one and one fourth to two and one fourth centim., width one to one and one half centim.), flattened out at the insertion; of cylindro-conical shape, but slightly bulged on one side; little elongated and ending abruptly by a prominent and well delineated point, hence the characteristic name of *pointue* (pointed) under which it is known in certain localities. The fruit changes from green to red, and finally becomes, at maturity, of a bluish-black color, with a few spots of dark red; it is dimly dotted, hard when ripe, and very hoary; thin skin; pulp whitish, colored by dirty red and not abundant juice; pit pretty large, of the general form of the olive, with wrinkled surface, and a very sharp point; tree of second maturity.

OBSERVATIONS.

The *Oliviere* is one of the most ancient varieties of olive trees, cultivated in certain parts of Languedoc. *Amoreux* states this fact in his *Traite de l'Oliviere*, published at the end of the last century: "The *Ouliva pounchuda* is one of the most common around *Montpellier*, and it is almost the only one to be seen about *Narbonne*, and throughout *Languedoc* as far as *Beziers*."

There are but few of these large plantations remaining to-day, but the *Oliviere*, either alone or mingled with other varieties, may be found in almost every place where the land owners have preserved trees enough for their supply of oil, so that if the *Oliviere* cannot be considered the most cultivated variety, it is the most widely spread in Languedoc. It exists also in *Provence*, in *Roussillon*, in *Algeria*, and in certain parts of *Italy* and *Spain*.

The *Oliviere* is a very hardy tree of great longevity, sturdy, and withstands without much injury the most severe frosts. This opinion is shared by *Rozier Laure*, who, considering this variety as sensitive to cold, has undoubtedly made his observations in damp regions, where it was commonly met with in former times.

The *Oliviere* grows to perfection only in a rather rich soil. In soils that are too dry or too poor quality, its vigor lessens; its production is affected, and it becomes then inferior to more robust varieties. In suitable ground the *Oliviere* is very productive, it bears abundantly and most every year.

The quality of the oil expressed from the *Oliviere* varies greatly according to the nature of the soil where it is grown; good when grown in gravelly or light soil; the oil is, on the other hand, turbid, that is, full of sediment, when coming out of damp or rich lands. In the latter case it is little liked for table use. Owing to its vigor the *Oliviere* withstands without much inconvenience severe pruning and even the heavy amputations to which it is at times subjected. The old wood gives new shoots easily and can very well be grafted. Most of the hardy varieties, however, possess the same qualities.

Lucques.*

(Figure No. 6, Plate IV.)

Synonymes.—Olive de Lucques, Lucquoise (Basses-Alpes). Oliverolle (Beziers). Odorante. Olea minor, Lucensis, fructu oblongo, incuvo, odorato (Tournefort). Olea europaea ceraticarpa (Clemente).

DESCRIPTION.

Tree of middling vigor and development; semi-erect; cylindrical trunk; the bark comes off easily in long strips, so that the trunk is often almost entirely laid bare; the main limbs are either horizontal or erect; as a whole, the tree habitually takes the shape of a vase, a ball, or sometimes of an umbrella, according to the mode of trimming; shoots scarce; branches hardy, long, straight, erect, or horizontal; young branches pretty numerous, situated upon the limbs at a right angle, generally drooping, of a decided gray color, longitudinally striated and covered with great numbers of freckles; wood of hexagon form, especially at the end of young branches; prominent knots.

Leaf, sublinear lanceolate, pretty long, but narrow (mean length six to nine centim., width three fourths to one and one fourth centim.); upper face light green, dull, somewhat wrinkled; under face covered with a dirty white thin coating; limbs not very thick; nerves little marked, even on upper face; *Mucron* acute, short, bent round in the plane of the leaf; *Petiole* long, thin, bent round. The leaf is drawn back at the edges, it is unequilateral, and assumes the shape of a very much elongated crescent, ending by the *Mucron;* the cover of the tree is pretty light, owing to the limited number of leaves, their relative smallness, and the divergent disposition of the branches.

Fruits often isolated, distributed for the most part at the base of the young branches; *Peduncle* long, thin, entering into a shallow depression of the fruit; *Stigma* persistent in a well marked umbilic; olive pretty big (length two and one half to three centim., width one and one fourth to one and one half), of the form of a crescent or a keel, having both ends bent round, and the opposite side to the curvature nearly rectilinear, which makes it of a very peculiar shape. The fruit changes from a light green to shining bluish-black; very little hoary; the surface is slightly speckled; thin skin; abundant pulp; pit pretty big, of similar form as that of the fruit; bent round at both ends, with furrowed surface, ending by two points, the lower being the sharper; fruit ripens early.

OBSERVATIONS.

The *Lucques* is not a very common variety; it is found in large tracts in France only where the propagation of olives for the table forms a special industry. It seems to have originated in *Italy*, where it grows in several places, notably at *Verona*. It is commonly found in *Languedoc*, around *Beziers*, *Montpellier*, *Nimes*, *Lunel*, but it is little cultivated in *Provence*, except in the *Lower Alps;* it is also found in certain parts of the *Oriental Pyrenees*, whence it was brought to *Spain*.

The *Lucques* is a tolerably vigorous tree, of medium longevity. All writers who have studied this variety consider it as very enduring in cold weather and adapted for cultivation on the extreme boundaries of the olive tree region. It may be found in the most various situations, but it grows

*Now fruiting at Livermore.

to better advantage and gives larger crops in deep, hilly lands; it is not to be recommended for *garrique soile* (waste lands), or those of poor quality, in which it gives inferior results. The production of the *Lucques* is relatively small, but this cause of inferiority is partly compensated by the beauty and excellent quality of the olives gathered green for pickling purposes. It is the most highly prized and best table olive, and it always commands the highest price in the market when gathered at the right time. The oil furnished by the *Lucques* is of very good quality, but its fruits are very seldom used for that purpose; except in cases of disease, the olives are always gathered up green, as stated above.

Pigale.

(Figure No. 7, Plate V.)

Synonymes.—Pigaou (Herault). Pigalle *Amoreaux* (Montpellier), Nimes, Beziers. Pigatado, *Amoreaux* (Narbonne). Pognue, *Amoreaux* (Grasse). Pigau, Marbree, Tiquetee, Rozier, Olea minor rotunda, ex rubro et nigro variegata. *Garidel* Olea variegata *Gouan.* Flor. Monsp. (?) Olea pignola, *Risso.*

DESCRIPTION.

This tree is tall, semi-erect, and hardy, canaliculate trunk; bark grayish, knotty, coming off in large pieces about the trunk and primary ramifications.

The main limbs are most always upright or semi-erect, seldom horizontal.

It is one of the tallest olive trees of Languedoc, when allowed to grow without heavy amputations.

Shoots numerous and hardy.

Branches numerous, hardy, big, smooth, of dirty gray color, much swollen at their insertion, which is at an acute angle; wood slightly channeled on young branches, with small freckles, not numerous and irregularly scattered; knots little prominent.

The branches are slightly drooping in general; leaf lanceolate, rather short, large enough (mean length six to seven centim., width one and one fourth to one and three fourths), a little drawn in towards the insertion; upper face deep green, smooth, riddled with small white punctures, very well marked (peculiar); under face greenish white; limbs thick and a little coriaceous, with edges slightly drawn back, so that the leaf has pretty much the appearance of a wide and shallow channel; nerves a little prominent on the under face only; Petiole big, short, straight, growing out of the branch at almost a right angle. The leaves are regularly distributed on the young branches, and almost perpendicular to the latter; they are numerous enough, but owing to the tree spreading out pretty much, as a rule, the cover of the tree is not very thick.

Fruits regularly distributed on the whole length of the branch, isolated or grouped; *Peduncle* long enough, big, light yellow, inserted into a deep depression; *Stigma* little apparent; *Olive* rather big (mean length two to two and one half centim., width one and one quarter to one and one half centim.); cylindrical, regular, oblong, rounded off at both ends; red at first, the fruit finally becomes a deep black; hoary to a small degree and but for a short while gets very shiny; upon this shiny background appear numerous white dots, well defined, hence its name of *Pigale.* This olive remains firm until ripe; skin thick, pulp fleshy, little juicy, colored white or light vinous red; *pit* big, of regular shape as the olive itself; late variety.

OBSERVATIONS.

The *Pigale* is a commendable variety. Granting that its production is somewhat curtailed by its luxuriant growth of wood, the fruits are of good quality and fit for table use, as well as giving a great deal of oil of excellent quality.

The largest plantations of this variety were formerly around *Montpellier*, *Narbonne*, and *Nimes;* some important ones are still found in the *garrigues*, of the *commune of St. Georges*, near *Montpellier;* it is also met with in Provence, especially about *Aix*. As this olive ripens very late it cannot be gathered only late in winter, when often its surface gets wrinkled on account of the frost. It would be opportune in large plantations to mingle the *Pigale* with earlier varieties, so as to have ample time for picking.

OTHER INTRODUCED VARIETIES.

The main object in describing the varieties herein mentioned is for the purpose of identification, and in order to straighten, if possible, the nomenclature of the olive, which is a very mixed one. There are varieties now fruiting in this State known only by some of their synonymes. In one case a variety was propagated under three synonymes, and this fact was not, and could not be, discovered until the trees fruited. The fault lies with the nurserymen abroad, where so many names have been given to varieties, and in consequence thereof the identity of a certain variety by its name is very difficult, and is only known by few.

The following varieties are now fruiting in several parts of this State, and are of the earlier kinds. Other varieties and the late ones will be described, with general observations thereto, is a subsequent article.

PENDOULIER.

(Figure No. 8, Plate VI.)

At the last meeting of the State Board of Horticulture (July 2, 1888,) I reported this variety as being somewhat smaller than the Mission. This was due to the fact that the trees from which the specimens were taken, and from which the cuts were made, had not been cultivated or pruned for five years.

Tree, is a beautiful one, of a vigorous growth, and of large dimensions; branches, drooping (weeping) in character; color, of wood-light green, with smooth, clear surface; it is a tree of very good production.

Fruit, large, generally accumulating singly in opposite directions, also by twos on the fruit stem; length, one and one eighth inches; width, three fourths; color, wine red, changing to deep blue-black; has on the surface a number of very small white specks, which are quite visible, but very minute.

Pit (*kernel*), three quarters of an inch long, tapering at the upper end, broad at center, with a curve commencing about the center down to the point.

OBSERVATIONS.

At Vacaville this variety is growing in the orchard of Mr. A. Montpellier. Mr. Montpellier imported his trees from Italy in 1885. They have been planted three years; one of the trees bore fruit for the first time last year.

This year all bore fruit (five trees) excepting one that has not received any irrigation. Since the trees were planted they have received very good care—they have all been irrigated excepting one; this non-irrigated tree receiving the same treatment, has made fair growth, but is not one tenth the size of the other trees, and from present indications it will be several years before it will bear. The fruit ripened in the first part of October.

At Sonoma this variety is growing in the orchard of Mr. L. P. Rixford. Mr. Rixford imported his trees from France some ten years ago. The trees four years after planting bore fruit in great numbers, and have continued to bear good and regular crops every year; they ripen in Sonoma in November. During the last five years (the place having been rented), the trees received no cultivation or pruning. Notwithstanding this, their production has been good, although the fruit has been somewhat small.

Mr. George E. Ladd, of Atwater, Merced County, has also a few trees, which bore fruit this year for the first time. They ripened there about the same time as at Vacaville.

Manzanillo.

(Figure No. 9, Plate VI.)

Fruit, of large size, of irregular orange shape.

Color, brilliant purple, changing when mature to a deep blue-black, with very minute white specks.

Pit, of a peculiar shape, and different from those of any other olive. This is an early variety. I obtained specimens of it in the early part of October.

OBSERVATIONS.

At the orchard of Don Juan Gallegos, at the Mission San José, I saw several large trees of this variety that were loaded with fruit. From all appearances the tree is a rapid grower and a prolific bearer; the fruit being large makes it easy of handling. Mr. Geo. E. Ladd, of Atwater, has also a few trees which bore fruit this year, maturing there much ahead of the above named place. Dr. J. M. Stewart, of Santa Cruz, has several trees in bearing. There are also a few trees in bearing at San José, Niles, and at Santa Barbara. This olive is excellent for pickling and for oil.

Rubra.

(Figure No. 10, Plate VII.)

This is a remarkable variety; fruit medium small, but bears heavy and regular crops. This olive is best suited for oil, but is also used for pickling. I saw trees of this variety in full bearing in the orchard of Mr. John Rock, at San José. The trees were quite large, and the limbs were very thickly covered with fruit; in fact, it was a wonder to me that the trees were able to hold the weight of such a heavy crop without being propped. At Livermore, in the orchard of Mr. Chas. A. Wetmore, I also saw trees of this variety in fruit, the trees only having been planted two years. This tree begins to fruit quite young, and is a prolific bearer.

Macrocarpa.

(Figure No. 11, Plate VII.)

Fruit very large, of light purple color, changing to red black when mature; fruits accumulate on the branches singly and in twos, in opposite directions; tree is of small dimensions, and drooping in character; the leaf is small and narrow; an early variety. The fruit is only used for pickles, to which purpose it is well suited; they contain very little oil, which is not of good quality.

Uvaria.

(Figure No. 12, Plate VIII.)

This is a valuable olive, both for pickles and for oil; fruit hangs in large clusters, of a bluish-black grape color, resembling a cluster of grapes. I have counted as many as fifteen large ripe berries on a cluster, as shown in Figure No. 12; ripens in November; a rapid grower and a very prolific bearer. I consider this variety one of the most valuable. This olive is now fruiting in San José, Niles, and Saratoga.

Atro-vialacea.

(Figure No. 13, Plate IX.)

Fruit medium to large, of a deep blue-black color; tree is a vigorous grower, of a weeping habit and of good production; a most valuable variety both for pickles and for oil.

Pendulina.

(Figure No. 14, Plate X.)

This is a handsome tree and a good bearer; fruit medium to large; ripens early. The fruit is said to produce a fine grade of oil. It is used for pickling considerably, both in its ripe and green state. This year the fruit ripened in the latter part of October. This variety is found growing in several parts of the Livermore Valley, Santa Cruz, San José, Niles, and Mission San José.

Columella.

(Figure No. 15, Plate X.)

Synonymes.—Loaime, Pasala, Columballa.

I consider this variety a most valuable acquisition, because of its productiveness and fruit of superior quality. The weight of the fruit generally brings the branches to the ground, unless they be propped. The fruit is of a very clear yellow color before maturity, therefore most valuable for a pickling olive. The tree is a rapid grower, of medium dimensions, stocky, and well able to support the weight of the fruit. This variety is found growing in Livermore, San José, Niles, and Saratoga. The fruit through the months of November and December retains its yellowish color, then changes to wine red, and when mature to blue-black.

Redding Picholine (Cal.).

(Figures Nos. 16, 17, and 18, Plate XI.)

This little olive was introduced into this State several years ago; it is a tree of small dimensious; fruit small, of a deep blue-black color; the fruit is gathered on cloths, being stripped from the limb with a hand wooden comb. The fruit makes good oil and a sweet pickle, but the tree is best suited as a stock. The true name of this olive is unknown. I also fail to find it described in any book on the olive; possibly in its native country it grows to better proportions than here. It does not belong to the Picholine type.

Mission.

(Figures Nos. 19 and 20, Plate XI.)

This tree is of good production, and of very large dimensions; fruit varies in form; several types have been observed on trees; this is somewhat peculiar, as among other varieties this does not occur. The fruit hangs on the branches singly, in twos, threes, and also in clusters; color, deep purple changing to jet black. It carries on its surface numerous white specks, but gradually they nearly disappear upon ripening; a free stone; ripens late.

OBSERVATIONS.

There are several "types" of what is known to be the "Mission" olive. Different types are found in almost every old orchard in the State. At the Mission San José, Mr. J. Rock and I discovered seven types in the Mission Orchard. Some are early, and some late. Some are long and pointed, while others are round. At this place we discovered a tree that is different from any I have seen. That tree is over a hundred years old, and its branches were heavily laden with very large berries. The fruit is of extra large size, and very early. At the time we visited the place (November fifteenth) no green fruit could be seen on that tree. The habit of this tree is also different from any other Mission tree. It has a weeping habit, resembling a willow, having a willow-like leaf. Alongside of this tree were several other trees of the same age. The trunk of one of them measured five feet four and three quarters inches in circumference, at about four feet from the ground. All these trees receive the same care, and are on the same kind of soil. The Mission is a tree of great longevity; and those trees now growing at the various Missions throughout the State, in the prime of health, over a hundred years old, are enough to substantiate this statement; therefore needs no comment. It is a tree that has done exceedingly well in this State, and better when properly cared for, and can be found growing and fruiting in almost every county. I have seen statements published, in which the writers contend that this olive is not worth propagating; that it is the wild olive of France. How absurd these statements are; and none but the non-informed could give them utterance.

BUDDING AND GRAFTING—NEW AND IMPROVED METHODS.

Budding the olive by the ordinary methods is somewhat difficult, and only about 15 to 25 per cent can be made to grow. This, however, is very much overcome by the simple methods herein given.

TWIG BUD.

This is an old and simple method, practiced among florists and nurserymen with plants that are difficult to bud or graft in the ordinary way. The bud is cut, as shown in the illustration, Figure No. 21, which is the scion. The cut is made deep into the wood, in order to give the bud as much bark as possible. The leaves are partly cut off, leaving at least a half inch of the leaf on the bud to prevent the bud from drying. Then, with the sharp point of the budding knife, the greatest part of the wood inside of the bud is removed, as shown in Figure No. 23. If part of the wood is not removed, then the bud cannot take, as the wood in it prevents the two barks (the inner bark of the bud and the inner bark of the stock) from uniting. When the wood has been partly removed from the bud, the bud is inserted into the stock, as budding is done in the regular ordinary way, and tied tight. At the end of three weeks the string is removed, and part of the top of the stock is cut back to force the bud to start. As the bud grows, the foliage of the stock is gradually removed, until the bud is able to take up the entire flow of sap. It is then left to grow, and trained, as shown in Figure No. 24. When the bud has grown and become stocky, what remains of the stock above the bud is cut smooth, close to the bud, to allow it to heal over. This process is performed at any time of the year when the sap flows freely. If done late in the summer the buds must be left to lie dormant through the winter. Best results are obtained when the buds are inserted early in the spring of the year, as the operation can be performed to a much better advantage, and the buds will grow to some height before the winter months set in. When inserted in large orchard trees, or in limbs of large trees, they are left to grow until they have attained such a size as will justify in the removal of the entire top.

EYE BUDDING.

This new method of "eye budding" has been brought into practice by Mr. Charles A. Wetmore, of Livermore, President of the Board of State Viticultural Commissioners, although a similar method has been practiced, but not on the olive, called ring budding, and differs from the fact that the bark of the stock is not used to protect the bud, as in this method. In this method the bud is removed (every leaf is a bud) as shown in Figure No. 25. The leaf is cut off close to the bud, then the bud is removed, as shown in the illustration (the buds do not grow where the bud is removed, as shown in Figure No. 25; this is only intended to show how the buds are removed from the scion), and a similar cut is made in the stock. The lower part is not cut, but the flap (or bark) is turned down, and the bud inserted, as shown in Figures Nos. 26 and 27. It does not matter if the buds do not fit (the bud should always be a little smaller than the space in which it is inserted). This being done, the flap (or bark) is turned up, covering the bud entirely; then it is tied tight with heavy twine. The twine for this purpose should not be less than eighteen ply. The success of the operation lies in the tying. If it should not be tied tight the bud will surely die. Mr. Wetmore found that the best way was to throw the twine in water, and tie it while wet. After the bud has been inserted two weeks, the string is removed, and a week or so after that the tree is girdled above the bud, to force it to start. This girdling consists of a ring of bark being removed from the stock, being cut an inch or so above the bud. Care should be taken not to injure (by scraping) the wood after the ring is removed, as this would kill the inner bark, and cause the tree to die back

before the bud has had a chance to start. After the bud has started it is trained to the stock, and left to grow until large enough to justify the removing of the entire top, and allow the bud to become the tree.

Time of Budding.—The best time is in early spring and through the summer, when the sap flows freely.

AN IMPROVED METHOD.

Mr. Wetmore discovered that by making a cut in the shape of an H and raising the bark from the center crosscut (up and down) and the bud inserted, as shown in Figure No. 28, that both ends of the bud became protected, while in the other method only one.

He considers this an improvement, as it also has the advantage that large buds having a large bulge at the leaf part can be used to an advantage, while they cannot in the method previously described.

OBSERVATIONS.

At the orchard of Mr. Wetmore I saw trees of nearly every size, varying from one to six inches in diameter, that had been budded a year and two years. Some of the buds were very large and had grown to a height of about four feet, and were in trees that at the time were loaded with fruit. Mr. Wetmore intends to leave his trees bear another year, when he will allow the buds to take the place of the top; he also expects some of these buds to bear fruit the coming season, and I believe they will, because alongside of them were trees loaded with fruit that were not as large as the growth of the buds.

GRAFTING.

Cleft Graft.—This method is similar to the one used by orchardists, only that the cut in the stock is not made in the center, as in the old way. The cut is made from either side, as shown in Figure No. 30. The graft is cut from both sides, as in the old way, to be large at the surface side and thin at the inner; then it is inserted into the stock, as shown in Figure No. 31. The graft is driven down as far as it will go, and is made to fit exactly (both barks to be even) on the surface side, the other side does not matter, as the unit of the graft and stock is on the surface side. In time both sides heal over. After the graft is inserted it must be tied and waxed, and if the operation is performed in the field, it must be covered up with earth, leaving as little of the graft exposed as possible. The entire leaves on the grafts must not be cut off, at least one third of the leaf must be left (as shown in Figure No. 31) to prevent the graft from drying before it has had time to unite with the stock, also the entire leaf must not be allowed to remain on the graft; the trimming of the leaf prevents it from carrying off too rapidly the fluids of evaporation. In this method one point must be observed, and that is the manner in which the cut in the stock is to be made. If due precautions are not taken and the cut be made in the center of the stock, the stock will crack at the time the graft is inserted and a perfect fit cannot be had. The more the graft is pushed down into the stock the more the stock will crack below the point of the graft; this results in the loss of the entire tree.

Time of Grafting.—The best time to graft the olive is through the summer months. The operation can be performed at any time when the trees (stock) are putting forth new growth. It must be borne in mind that this method is for grafting stock close to the ground. It may do above ground, but for that purpose budding is the simplest and best.

INDOOR GRAFTING.

This method, as illustrated in Figures Nos. 32, 33, and 34, is practiced mostly indoor, in the greenhouse, or under frames. The stock is not entirely cut off, as shown in the illustration, but about one half of the foliage is removed. The operation is performed by cutting into the stock, simply pressing the knife slightly, so that when the cut above it is made it will form at the lower part a cut in the shape of a V. This cut is made right and directly over a bud (a leaf) on the stock; this has the tendency of drawing to the graft nutritious sap, which keeps it alive, and aids it in uniting with the stock. The graft is then trimmed, leaving to it about one third of the leaves, as shown in the illustration, and inserted as shown in Figure No. 33. Care should be taken that both barks fit exactly on one side, while the other side does not matter, as it heals over in time. The graft may be waxed, if the operator so desires, but it is immaterial, unless under low heat, or no heat at all. After the graft has started, the stock above the bud is cut back, as shown in Figure No. 34, when they may be removed to the open air or planted in nursery.

The above described methods of budding and grafting are very simple, and can be performed by any untrained hand.

ADVICE TO GROWERS.

At present there is considerable inquiry in regard to new varieties. Among the first questions asked is, "Which is the best variety?" I wish I were able to answer this question, but regret that it cannot be answered even if the varieties now fruiting were something of the past. The fruit grower who expects to succeed in the race of success must study for himself (which he generally does), investigate what is now being done, and not jump at hasty conclusions, as the many who have planted the Redding or California Picholine, on the advice that it was the best olive, before it had borne fruit. It is yet too early to even say which six varieties are the best, having had only this year's production. In another year much will be known, and I will do all that lies in my power in the furtherance of the investigation. All the varieties now fruiting will be subjected to a test, both for pickling and oil; the results will be given in a subsequent article. In the meantime, my advice to growers is, to plant whatever stock they can get; all stocks are good, and can be grafted or budded even after several years of growth. Enough trees of new varieties cannot be had, unless at very high prices, but the Redding Picholine stock is cheap, and plenty of it can be obtained; it is also very easy to raise. Afterwards it is an easy matter to graft or bud them with the buds or grafts from a few small trees.

In conclusion I desire to express my thanks to Mr. John Rock, of Niles, for assistance rendered me, in indentifying varieties, and he is deserving the thanks of the fruit growers, for having distributed at his own expense, many of the varieties now fruiting. My thanks are also due to Mr. Chas. A. Wetmore, of Livermore, Mr. Geo. E. Ladd, of Atwater, and to Mr. Juan Gallegos, of Mission San José, for the generous aid I have received at their hands.

Mr. Gray moved that the thanks of the convention be tendered to Mr. Lelong, for his able essay on the olive.

Carried.

OLIVE CULTURE IN BUTTE COUNTY.

Essay by JOHN C. GRAY, Oroville.

About the twentieth of March, 1886, I set out twenty acres of Mission olives. They were planted in the foothills, about five miles east of Oroville, in Butte County. The trees grew from cuttings and were two years old. They were two and three feet in length, and about half an inch in diameter. The trees were taken from the cars and hauled five miles to the land in which they were afterwards set, and there piled on the ground, exposed to the hot sun and a fierce north wind. The ground had to be plowed. This was done as fast as three teams could do it. A crew of men were put at work setting out the trees as fast as possible. The rows were not straight, nor the trees put an equal distance apart, though an attempt was made to set them twenty feet distant from each other. The land consisted of a red loam, mixed with some gravel. It does not differ materially from the red earth found almost everywhere along the low foothills of the Sierras, on the side next to the Sacramento Valley. The ground, which had thus hastily been prepared and planted, was plowed again later in the spring and well harrowed. The trees were irrigated in July and again in the middle of August. About the first of October, about half the trees were dry enough to break off close to the cutting. Many of them were, in fact, so broken off and supposed to be of no value. The remainder remained green, but showed no signs of having made any growth. During the following winter the ground was again plowed and well harrowed. In May a few of the trees seemed to put forth new shoots, and gave evidence of having some life left. Later in the season new shoots came up from some of the cuttings that the dried tops had broken off from the season before, and these grew very rapidly, and are now the finest trees in the orchard. During the summer of 1887 the ground was well cultivated and the trees irrigated twice. They made but little growth during the year. During the year 1887 they made a very rapid growth, many of them being seven and eight feet in height. But the strangest part of the business is, that even at this late day trees are coming up from cuttings that have been in the ground since March, 1888. Some of them are not four inches in height, and yet they give promise of one day becoming a tree like their more forward neighbors.

But the most important question that is asked by the person who desires to plant olives along the foothills of the Sacramento Valley is: "Will they grow and bear fruit without irrigation?" Quite a number of the most thrifty, as well as rapidly growing trees, have not been irrigated at all. Those not irrigated look as well to-day as those that have been irrigated.

A few days ago I visited the ten-acre field of Mr. C. E. Kusel, about two miles from Oroville. The trees are between two and three feet high, and were set out in the middle of March, 1888. They are the Mission variety. They have not been irrigated, but have been well cultivated. More than 95 per cent were alive and growing as well as the owner could desire.

I have seen the olives that grew upon two trees near Oroville that had never been irrigated, and the berry was large, plump, and as perfect as those that grow in our yards about the house and receive irrigation daily.

I am of the opinion that all one needs to do to make his trees flourish and bear well is to cultivate the ground well and often, and use fertilizers quite liberally; for these foothill lands are not so rich and strong as those

further down in the valley. The winter of 1887–8 was the coldest we have had on this coast since 1854. The snow fell to the depth of two inches over my orchard and remained on the ground four days. On the second morning it was hard enough to bear my weight as I walked across the field. Yet when the warm days came again I could not see that the trees had suffered in the least from the effects of the cold. My neighbors examined them critically, for they felt sure that I had seen the last of my folly alive, but they found no sign of their having been injured.

The olive will grow on lands that extend into the mountains to an elevation of at least two thousand feet. I know of no tests having been made higher than that. Mine are on land having an elevation of seven hundred feet.

DISCUSSION ON OLIVE CULTURE.

Mr. Wilcox: In my neighborhood, about three miles from Santa Clara, in the old Mission we have olive trees more than a hundred years old. We have what is called the artesian belt midway between the headwaters of the Bay of Alviso and Santa Clara, where it is proposed to make a broad avenue to be called Olive Avenue, and I would like to know what olive will grow best in such soil and under such conditions. It is heavy adobe land, and down about six feet from the surface is a stratum of clay which holds water.

Mr. P. W. Butler: I would like Mr. Dondero to tell us, if where those finest olives are grown up in the foothills without irrigation, if they have facilities for irrigating, and, if they have, whether it would not be desirable in his opinion?

Mr. Dondero: I think there is hardly any country that has the facility for irrigation that they have there. The fact is that Italy has the most perfect irrigation system known in Europe or in the world, and wherever it has been tried the tree, as I stated, is generally benefited, and the fruit never—at least, the olive is always of an inferior quality.

Mr. Butler: I have had a little experience in olive growing, though not an olive fruit grower. I have some two hundred olive trees planted along avenues and surrounding my orchard, just simply for ornamentation, thinking that if any profit came from them there would be that much gain; but I have had a good chance to make comparisons between those irrigated and not irrigated, for there were a few olive trees along the line of my fence that never have been irrigated, and they are not one fourth of the size of those where we have had a chance to irrigate them; they have fruited very little at all, and the fruit is very small and inferior, and I notice those that had the most irrigation—it is all hillside land—are almost as large as the peach trees, both the same, seven years old, and the fruit is very fine; they both had the same cultivation. That is the condition in the foothills of Sierra Valley mountains. We have a rainfall of twenty-five to twenty-seven inches every year, but the soil is somewhat shallow, from two to four feet deep, and not much moisture can be conserved in the ground, even by cultivation, through a hot summer; in low land, where the soil is deeper, there would be more moisture retained, and, possibly, the trees would do better without irrigation. I do not know whether the soil in the conditions are the same in the olive countries, but if it were I should naturally infer that even if it produced an inferior oil that the quantity would be so much less that it would be a gain to irrigate.

Mr. Klee: I think if you compare the samples and the cut presented by Mr. Lelong with the *Picholine*, as grown in France, and as described, you will feel satisfied that our so called *Picholine* is not the true one; however,

this so called *Picholine* is all over this State; it has been planted largely, and the question is what to do with it. The oil that is made from the *Picholine* I believe is of fair quality, but I think the records will prove that it is of poorer yield, and my best recollection of the yield given at the orchard planted by Mr. Gould at Auburn only amounted to something like one gallon per hundred pounds two years ago, and this year I have learned it has been almost the same. This I believe is very unsatisfactory, and although there may be olives that are not any larger that are very fine oil olives, this evidently does not seem to come up to the standard. Now, before going further, there is one point that I think ought to be settled. If it is to be used, and cannot be used as a direct producer, it has to be budded or grafted. The question is, then: Is it valuable for that purpose? I should like to ascertain from Mr. Butler, and from others who have grown the variety, if it compares in vigor and size with the Mission. My observation is, it does; if so, I see no objection to using it as a grafting stock; but if, as I understood as it was stated, that it was rather a small tree, it will be objectionable.

Mr. Butler: As far as my observations have gone, and I must confess I have given but very little attention to the tree, as I grew them for ornament chiefly, I have neglected it very greatly in comparison to other trees. The Picholine is a vigorous tree with me, and the foliage is very different from that on the Mission; the leaf of the Mission is more elongated, while on the Picholine it is shorter and seems to be rather thick; it looks more dense, and I should take it to be quite as vigorous a grower as the other, and see no reason why it would not be desirable to bud on. But I see other people here planting whole orchards of the Picholine; it seems as if some people were making a serious mistake, and we see some people budding over to the Picholine. We get so many different opinions, it is necessary to get statistics to know what should be produced. I have dealt in olive oil for many years, and made a specialty for twenty-five years of the finest oils imported. The firm of Crosse & Blackwell are known all over the world as one of the biggest houses, the largest in their specialties, and for putting up the very best quality of everything they touch, and their special brand is the Lucca oil. There is another oil which is imported on this coast by a house in San Francisco called Barton and Guestier. It is well known as one of the best oils on this coast in commerce or trade, and that is what we are dealing with, gentlemen; we are not dealing in any fancy article that somebody may get up and call superior to anything else, and these are the best brands of imported oils, and our President here manufacturing oil on this coast, let me make some comparison from a commercial point of view; we have oil here, the finest that is retailed, from sixty-five to seventy-five cents a bottle, and we have an oil manufactured by our President that he can sell at two dollars per bottle at wholesale, having a demand for more than he can produce. Now, can he or anybody else delude the people of this country so that they will pay him more than double the price for oil so much inferior in quality to the best which is manufactured in Italy?

Mr. Stabler: Will you explain the kind of soil you planted your trees in, and whether you succeeded in growing other kinds of fruit to the same age without irrigation?

Mr. Butler: It is a good, thick soil, from two to three feet deep, with a granite base; that is, you can dig with a pick and go down to an indefinite depth. It is the soil upon which we grow peaches in Placer County, we think, as fine as they can be produced in this or any other country. We irrigate heavily there; in the summer there is very little moisture in the

air, and we look upon irrigation as a positive advantage. Very many people, until within the last year or two, have said they could grow trees without irrigation just as well as with it. The tree can be grown, but we have failed to produce fruit of high excellence without irrigation. In places along the river beds we have soils similar to those of the gentleman's who asked me the question. In his rich river bottoms they grow fruit of the same kind without irrigation; but on those sloping hillsides, where there is good drainage, we get so much better success by irrigation with all kinds of fruit—that so far as the olive is concerned I will not except that. As to the quality I will not pretend to be a judge, because I am not growing that fruit for profit.

[Vice-President Johnston in the chair.]

Mr. Cooper: Mr. Chairman, ladies and gentlemen: As a matter of fact all that I know has already been published, so that I can have but little to say. Before I commenced in any very extended way olive culture in Santa Barbara County, I purchased all the literature that there was to be found in Europe, in the Spanish, the Italian, and the French languages, spending a good deal of money in so doing; afterwards, not being able to read in the Spanish or Italian, I employed a professor from St. Louis whom I brought out to my place at considerable expense, to translate these books; however, very soon after that I found that all the literature that was really worth knowing, was in the French language, which I could read, and I stopped any further consideration of either the Italian or the Spanish books. I observed, also, that every author had a different name for these olives; there is scarcely any three Spanish writers on the subject that give the same names; the same way with the Italian and with the French. There are no names for olives, practically speaking, because I was unable to judge between these, which was right, and which was wrong; I made up my mind from samples I received from the high table land around Nice, having sent an agent to visit the south of Europe during the olive-making season, at great expense, and employed an interpreter in Paris who could speak Spanish, French, and Italian. They traveled all through the olive districts, and my agent gathered for me samples of the limbs cut from different trees, samples of the pomace during the process of making, samples of the oil as it ran from the press, samples of the apparatus used, the drawings of all the mills, samples of the reed cloths in which they were pressed, of which Mr. Dondero has spoken; and I satisfied my mind before going into it very extensively, that the Mission olive grown in Santa Barbara was exactly the same thing as grown on the high table lands of Nice. The branches, the leaves, the olives, and the insects that were on the branches, when sent to me by express from Paris, were exactly the same as they were in Santa Barbara, so that I went on with the Mission olive, and am going on still. I plant about two thousand trees every winter, and I have now in preparation to plant about seven thousand trees, then I shall stop.

Mr. Butler: Is it not understood that the olive you speak of, grown in Europe, was for the best oil?

Mr. Cooper: It was the olive from which they made the oil, and which a great many told me was the best oil made in the world.

Mr. Butler: Have you had any reliable information from that country to change your opinion since then?

Mr. Cooper: I have not; but I am like the rest of you—I am very anxious to learn, and I enjoyed very greatly this morning the essay of Mr. Charles Dondero, because we have not arrived at perfection yet by a long ways.

MR. BUTLER: What I am speaking of is for proof of the gentleman's assertion, and I would like to have him produce the oil that he calls first rate, when that produced by yourself is only second or third rate.

MR. COOPER: I presume that Mr. Dondero made those remarks, not from the knowledge of the oil that I produced, but from the manner in which I make it. There they allow a portion of the oil to run out without any pressing, which they call virgin oil; they press it a little and call it second pressing, and a little more the third pressing. I take out the first pressing from cold presses, without any heat as described to a certain extent by Mr. Dondero; I get a good deal more oil than he recommended in his essay, and then I take the pomace from the press and put it back in the mill, grind it exactly in the same way as described by Mr. Dondero, and pour, not hot water, but boiling water, on it to liberate the balance of the oil, to make what I call and style the second pressing, which is preferred by some people. I weigh in every berry, and take all the precautions as described by Mr. Dondero; these olives are put through a large fanning mill so as to blow out every substance in the olives before they are dried, but I dry them with artificial heat in twenty-four hours, the thermometer not to exceed 120 degrees; then they are crushed and the oil is made right away; there is no delay between the picking and the making of the oil. The commercial value of this oil is perhaps a little fancy. In the first place, the Lucca oil which was mentioned, put up by Crosse & Blackwell, is very largely adulterated of late—probably now more than 75 per cent adulterations, and 25 per cent of olive oil. The Barton & Guestier oil, put up in France, and sold at the highest price as a French oil in San Francisco, is also largely adulterated. There is no question about it; it can be tried by any person who has read what is laid down upon the wrapper of every bottle I sell; it tells every housewife how she can detect whether it is pure or not, but she must have a bottle of mine to try it with. My oil is pure olive oil, and therefore an absolute test. Now, these olives are all weighed as they are brought in from the pickers. There is a careful record kept of that weight, and after it is made, drawn, filtered, and bottled, there is a careful record kept of every bottle that goes out of the mill. I get a little more than one pound of oil in the bottle, and as I stated in my treatise, I found that the best results I had had at that time were 10.56 pounds of olives to one bottle of oil. The difference between the percentage of olive oil, as given by the different authorities, deviates, from the fact that you do not know when these olives were weighed. The olive will lose 50 per cent in weight between the time it is picked from the tree and its dried state when crushed. In other words, the Mission olive will give 20 per cent of oil, if weighed after dried; 10 per cent, if weighed when picked from the tree. And it is my opinion that all those statistics laid down in the Italian, French, and Spanish books, take the weight of the olives after drying them when they were ready for the mill—hence the difference in the percentage. The only way in which I could come at the comparison or relative value of the Mission olive for making oil, as compared with other varieties, was this: I found that I produced more oil from an acre of ground than any statistics laid down in any book which I had; hence I satisfied myself, as I can sell all the oil at a high price, that I would go on planting the Mission olive.

MR. HATCH: I would like to ask, Mr. Cooper, if you have, in your investigations, decided which is the best to raise in California for pickling?

MR. COOPER: The Mission.

MR. KIMBALL, of San Diego: You place the temperature at which you dry your olives at 120 degrees, whilst Mr. Dondero claims that olives subjected to a temperature greater than 60 degrees the quality of the oil is

greatly deteriorated. I would like to have him inspect the oil to determine that fact.

MR. DONDERO: What I have stated is from the authorities that gave me the details, and the greatest oil maker of Italy, who has the most perfect system, states that they adhere to the rule never to go beyond 63 degrees Fahrenheit, if you want the finest kind of oil.

MR. KIMBALL: What is the normal temperature of the atmosphere where the oil is made?

MR. DONDERO: It is generally from 55 to 65 or 70 degrees.

MR. KIMBALL: In your essay I understand you to say that the temperature of 72 degrees would be taken to ripen the olive.

MR. DONDERO: That is the time the fruit is ripening—the heat of the season.

MR. KIMBALL: It seems to me the picking of the olive and its ripening progresses along for some two or three months; and it must be made during the time the temperature exceeds 63 degrees very much, even to 75 or 80 degrees. I cannot, for my life, see how the oil should be of the quality which you determine is its quality, when the temperature would far exceed the temperature at which the best oil can be made.

MR. DONDERO: That is the authority given by the most eminent oil producers. Of course I cannot go any further than that.

MR. BUTLER: I would like to ask the gentleman how he reconciles the assertion he made with the fact that the best brands imported to this country from Italy bring only 75 cents a bottle, when the oil manufactured by the President brings a price very much in excess of that?

MR. HATCH: And I would like to add to that the suggestion that there must be merit in the California article, from the fact that most foreign importations are preferred, even if they are inferior in quality.

GENERAL CHIPMAN, of Red Bluff: I hesitate to enter upon a discussion of a matter that I know nothing about; but I want to make one observation, without knowing anything about the cultivation of olives, and that is, it seems to me that Mr. Butler is fully answered by the statement of the President when he says that the best olive oil of Europe imported into this country is adulterated and, of course, cheaper. Now, I remember when the olive oil brought to this country was pure and when it was comparatively cheap. I remember to have bought it myself in Italy very cheap, and brought it over with me, and there was no question but what it was pure. But we must not forget that this country has become a great consumer of European goods; we have grown rich in twenty-five years, and are able to buy things; and then, as you will observe, there is a certain fancy that enters into these things. There are a great many people who would pay two dollars a bottle for your oil out of that fancy and in view of the fact that the foreign article is known to be adulterated.

MR. COOPER: The gentleman has asked the question if the great demand for this oil comes more for medicinal purposes than to be used as a luxury. It is valued for medicinal purposes because people know it is pure; if the people had confidence that the oil put up by Crosse & Blackwell, or Barton & Guestier, or any of the Spanish or Italian oils sold in San Francisco were pure, they would not perhaps pay those fancy prices for my oil; the fact that it is good, that it is sweet, that it will not become rancid in any reasonable length of time, and that it is known to be pure, gives it that extraordinary value.

MR. BUTLER: In one of the essays read here legislative intervention was asked in order to prevent adulteration in this State. Now, I would like to ask. if it becomes illegal to adulterate oil in this State, whether the great

consumption of this imported oil that is so largely adulterated; whether it is probable we could sell all the oil we produce for medicinal purposes, or whether these people would pay the price that you get for general consumption, and, if so, how are we going to compete with these people if they prefer to buy the adulterated oil—how can we compete with these adulterated oils?

MR. KIMBALL: I would like, for the information of Mr. Cooper, to answer the question of Mr. Butler. While General La Duc, the former Commissioner of Agriculture, was stopping at my house, I asked him as to the purity of imported oils. He said to me that under his instructions there had been made in the Department of Agriculture chemical tests of the oils produced and imported, and out of some sixty-six or sixty-seven samples imported the nearest to perfection was one sample of 94 per cent, next to that 73 per cent of oil, and down to one sample of only 4 per cent of olive oil, and that may be the reason of the difference of price between Mr. Cooper's oil and the imported.

MR. COOPER: I have only a few more remarks to make, as the questions have somewhat disturbed the thread of what I intended to say. However, as far as the value of pure oil is concerned, as compared with adulterated oil; nearly all recipes for making salads, as laid down in the books, give twice the quantity, on account of adulteration, that is really required of pure oil, hence one bottle of pure oil of the same weight will go as far as two bottles of adulterated oil. The adulterated oil, after the cork is drawn, probably one third of it would become rancid. Mr. Dondero's remarks about the degrees of heat were perfectly correct; the lower that you can keep the thermometer the longer the oil will last without becoming rancid, but there is no necessity now as long as 120 degrees, with proper ventilation in the artificial heat, will dry the berries so that the oil can be made in forty-eight hours from the time it is picked. It will keep at least one year in a saucer without becoming rancid. I have tried it twelve months in a saucer, with a gauze over it to keep insects out of it, without becoming rancid, and that is long enough. When we have to keep our oil five or six years, probably we will have to reduce the degree of heat. Now with regard to the pits. I have two or three times cracked with a hammer ten of these pits, not finding more than one that had any germ inside, so there is nothing inside of the berry in ordinary years to make oil of.

MR. BUTLER: Is that peculiar to that particular olive?

MR. COOPER: I can only speak of my own experience and my own place. I sent those pits to an experienced chemist in the City of Philadelphia—a thorough chemist, having gone through all the principal chemistry schools—in order to know what I should expect from the seed pits if I crushed them. He found nothing, and told me to go on and crack them, and do what I pleased with them; there was nothing in them to injure the oil.

MR. E. T. REYNOLDS announced that arrangements had been made to give all the visitors a ride through various places of interest, in the afternoon.

Here a recess was taken until seven o'clock in the evening.

THE RIDE.

About one o'clock in the afternoon, just after lunch, nearly one hundred single and double carriages were in readiness and waiting to be occupied by the many visitors to view Chico's vast surroundings. The line of carriages, or cortége, which it resembled, was led by one of the most enterprising citizens of that place, accompanied by General Vallejo, of Sonoma.

After having been driven perhaps only five minutes through one of the most beautiful drives in the State, we came to a flour mill, a very large structure, and between the mill and a cannery of similar build, we were driven into an outer field in the direction of the foothills. Soon we came within full view of a very large orchard, in which were observed trees of almost every kind. To our right were apricots, to our left peaches, as healthy as any as it is one's fortune to look upon. Going beyond, we came to a large orchard of almonds, which compared favorably with any grown anywhere, and we were more gratified in this belief upon being told that their production was equally as good. Going a little further, we came to a large vineyard, the production of which, so Mr. Gray informed us, had always been manufactured into raisins, and that not a single grape had ever been turned into wine. This information was met with a hearty approbation by the many among us who preferred "water straight," but the Mayor of Courtland was seen to sigh for home, his birthday being near.

A little beyond we came to a huge, monstrous oak tree, the branches of which extended over one hundred feet, and every carriage containing us was driven under its limbs. General Vallejo, in his quiet and modest way, arose to his feet in his buggy and said: "Friends, we are under the largest oak tree in the world, planted by the Almighty, I don't know when, the property of a gentleman who is not among us to-day; therefore, I propose three cheers for General John Bidwell, upon whose property we stand." These were given with a cheer and a whoop, and the party moved on. We had not traveled long, when we came to a large and roaring stream of water, that dashed over huge bowlders as if with joy for the freedom it enjoyed. Passing to the right of the stream, and high overhead was a long wooden canal, built from Chico to the mountains, for the purpose of floating lumber into the city, avoiding hauling. This was somewhat of a novelty to many of the party, for they had never floated lumber, only on boats and during freshets. A little beyond we came to quite an olive orchard in its third year's growth, and beyond that could be seen orange trees in all their luster. Before crossing the stream again, we came to what is commonly known as the "Wild Way," and wild it was; and perhaps we might have fallen over the steep grade, had it not been that the reins of every vehicle were in the hands of very skillful and expert drivers. Descending into a little valley below, we came to that same clear stream we had previously crossed, and it roared as before, as much as to say, "You are welcome, cross again." On reaching the other side, we came to a high elevation overlooking the stream and the beautiful growth by its side. To the right of us was a vast amount of land, its red and brownish color indicating its richness, and the stubble its fertility. So large was this tract of land that we failed to see its cultivated terminus. After having ridden perhaps an hour, we came to Chico Vicino, a newly laid out town bearing that name. Streets were laid out all through the tract as straight as an arrow, with wide sidewalks, wide enough to allow the planting of shade trees, which we understood was soon to be done. After leaving Chico Vicino, about two miles below we came to a large oak forest, and were driven alongside of this most beautiful park that nature built, until we came to the nursery—that is, the orchard nursery, for beyond this there is another nursery, the deer nursery.

Here in the orchard nursery were observed trees of an endless variety. All those trees which we had seen and which had for so many years borne luscious fruit, were at one time in this nursery. Farther beyond the orchard nursery was the vegetable garden, where all the vegetables for the cannery,

market, and home consumption are raised. A little beyond we came to the dairy. Numerous fences could be seen everywhere, and in the inclosures were observed many animals of the most valuable breeds, of all ages; some only a month old, or less, while others were observed to be occupied by only one, and by the roars that were heard and the dust that they threw into the air, we became satisfied that he was master there.

Going a little beyond we came to the other nursery—that is, the deer nursery. In an inclosure of about two acres were more than a dozen California deer. Here were some very young, so young that they could scarcely get about and cared but little for the presence of the party, while the others by their side, with horns measuring not less than two feet long, with many prongs, stood guard over them, and none of the party did care to enter, and were well satisfied of having the chance to peep through the fence. The fact of the deer being fed with pumpkins aroused General Vallejo's admiration, and he said: "In olden times we killed these fellows, for the mountains seemed to be full of them, now they are domesticated and reared at home; to you it may not seem strange, but it certainly does to me." Near these fences inclosing the deer were two rows of cherry trees. We having been driven between them, halted in front of the largest tree of the lot, and Mr. Allen said: "Now you see before you the largest cherry tree of California. That tree one season bore seven hundred and fifty pounds of cherries." Several of the visitors drew a long breath with gratification of having seen what had been their good fortune to see.

A little beyond these huge cherry trees we came to the Bidwell mansion, the home of General John Bidwell. The lawns were beautifully and tastefully arranged, and the air seemed to be filled with perfume from the numerous sweet-scented flowers. After having been driven through the many drives of the place, we were taken back to the hotel; it was then getting dark. As we left the carriage the driver pleasantly said, "You did not see all; half a day is not enough." His remarks were full of truth, for we had only ridden through part of one man's property.

EVENING SESSION.

THE GOVERNOR'S REPLY.

The Secretary read the following letter:

SACRAMENTO, CALIFORNIA, November 21, 1888.

Ellwood Cooper, President; B. M. Lelong, Secretary; care of Fruit Growers' Convention, Chico, California:

It is a source of great regret that your most kind message, addressed to the Governor, came during his absence from the office, as I know how earnest he is in all matters concerning the development of the State, and particularly that important branch represented by your association, a branch that is destined to add untold wealth to the State; and how gladly he would have recognized personally your high appreciation of the interest he has always taken in your success, an interest which I can assure you is of the sincerest and most disinterested character. I will take great pleasure in conveying to the Governor the high compliment extended in your message.

M. D. BORUCK, Private Secretary.

NATIVE DAUGHTERS OF THE GOLDEN WEST.

CHICO, CALIFORNIA, November 21, 1888.

GENTLEMEN: La Corona Parlor, No. 33, N. D. G. W., hereby tender you a cordial invitation to attend their Leap Year Social Hop at Henarie Hall, next Friday night, November twenty-third.

ALICE SPROUL, President.

LILY WHITE, Secretary.

MR. JOHNSTON: I move that the thanks of the convention be tendered to the young ladies, and their invitation accepted.

Carried.

REPORT OF COMMITTEE ON GERMAN METHODS.

Mr. WHITE, of the Committee on German Methods, reported that the matters referred to them would come up under the regular order—under number three—and that it would then be the duty of the whole convention to consider the subject, and was asked to be relieved from further consideration of the matter.

On motion the report was accepted and the committee discharged.

PEACH CULTURE.

Essay by P. W. BUTLER, Esq., Penryn.

Since the harvesting of the peach crop of this season (1888) many leading fruit growers and fruit dealers have been consulted, that the very latest data might be obtained relating to the production and disposition of this popular fruit. It is the general opinion that while peaches can be grown in most parts of California with the certainty of a fair average crop, yet in only a small portion of the State can they be grown with satisfactory profit. It is at points where it has been proven that they grow in the greatest perfection that peach orchards should be planted, and great care should be exercised in selecting the location. For table use, peaches require to be highly colored, of excellent flavor, and large in size. These qualities are obtained in the highest degree where orchards are planted on sloping hillsides, on undulating land that is well drained, where there is entire freedom from fogs, and continuous sunshine during the period of ripening. If peaches are to be sold fresh in the markets of the East, the orchard must not be distant from a main line of railroad transportation. If for canning or drying, lands more remote from railroads may be profitably used, because of their being cheaper.

VARIETIES TO PLANT.

If planting for shipment East, the varieties of freestones now preferred, ripening in the order mentioned, are the Alexander, Hale's Early, Foster, Susquehanna, Late Crawford, Brandywine, Salway, and Bilyeu's Late October; of clingstones, the Tuscan, Albright, George's Late, and Levy (or Henrietta). These varieties ripen in regular succession, beginning in May and ending in October. For canning or drying, the Muir and Wager may be added as being among the best varieties.

PLANTING.

In preparing the ground for planting, it should be thoroughly free from stumps and roots and plowed and subsoiled to a depth of sixteen inches or more, and no reasonable expense should be spared to have it perfectly pulverized. Planting in equilateral triangles is preferable to squares, as the ground is more completely occupied without the tops or roots of the trees intermingling. Fifteen per cent more trees can also be put on an acre by this method at same distances. The proper distance apart to place trees is now thought to be eighteen to twenty feet. Trees one year old are preferred.

PRUNING.

At the time of planting cut the tops from the trees to a uniform height of sixteen inches from the ground, and let from three to five of the branches growing at equal distances from each other form the top to the trees, and remove all other growth. Wrap the trees with paper below these branches to the ground as a protection from the sun and to keep out the borers. The following winter cut the branches back to six or eight inches long. The next year leave two or three shoots to each branch and cut them to a length of about twelve inches. When the tree is three years old, one third of the growth may be removed, but if a vigorous growth has been made, one half may be cut away and thinning be done to keep the tree properly balanced, with the outer limbs standing at an angle of thirty degrees from a perpendicular. This will always enable plowing to be done close to the tree. After this, one third of the yearly growth is generally removed until the tree is six or seven years old, when the longest branches only are cut back to keep the tree level on its top and thinning sufficient to prevent the top from becoming too bushy.

FERTILIZING.

Quite heavy fertilizing can be made profitable. Stable manures are the least expensive when obtained near the orchard. An excellent fertilizer is two hundred pounds of bone dust, twenty-five pounds of potash, and twenty-five pounds of lime, placed in barrels or vats, the potash dissolved and poured over the bone dust, and lime then placed on top, and the mass well wet; then covered for ten days, and applied broadcast on an acre of orchard in the fall or winter, plowing or cultivating to immediately follow. This, if applied yearly, is said to furnish the necessary amount of phosphoric acid, nitrogen, lime, and potash to keep the soil in a peach orchard from becoming exhausted.

CULTIVATING.

It is usual to begin next to the trees, and plow with one horse three or four furrows on each side of the row to a depth of five or six inches; then with a larger plow and two horses the centers can be plowed to a depth of eight inches. This can be done in the early winter, care being taken not to work the ground when too wet. In February or March a second plowing can be made, this time turning the furrows in an opposite direction, which brings the ground back to its original level. Cultivation should immediately follow, before the soil becomes hardened by exposure to the sun and wind. This must be repeated after each succeeding rain, as soon as it becomes sufficiently dry; and after rains have ceased at intervals of

two or three weeks, until the fruit is picked, when cultivation may be less frequent.

IRRIGATION.

Irrigation is usually begun in May, but it generally should be applied much earlier, sometimes in March and frequently in April, or whenever insufficient moisture is furnished by rainfall. It is well to plant the trees on a grade of about six inches fall to the rod. Ditches can be made with a single shovel plow, three feet apart, the rows of trees being the guide to the man making the furrows, and with a little experience, he can always make them on that grade so that water will run, while at less grade the work could not be done without surveying each furrow. Water should be run in the ditches until the ground is well saturated, then, as soon as it has become sufficiently dry, which takes from one to two days on light ground, but longer on heavier ground, it should be thoroughly cultivated to prevent baking, which, in most soils, is sure to occur unless cultivation follows each irrigation. Although this process is more expensive than the old method of running water in the same ditches through the entire season, the yield of fruit will be increased to an extent that will more than meet the extra expense. The fruit will be larger, and whether it is dried, canned, or sold fresh, the largest fruit sells for the highest price in the markets of the East.

PICKING AND PACKING.

Early peaches, such as the Alexander and Hale's Early, are only used when fresh, not being suited to either canning or drying, and all that cannot be used in eating or cooking must be wasted. Nearly all the later varieties, when not sold fresh, can be either canned or dried. For distant shipment peaches must be quite firm when picked, although they should be colored and show signs of being in a ripe condition. It is at this time that their increase in size is most rapid, and if picked too green they will not only be small, but will never attain good eating qualities, and be miserable when reaching market.

The methods of picking and packing now in use can be improved upon. If the picker drops a peach into a box or basket, and the fall is only a few inches, it is thereby injured, although the injury may not be perceived by the most careful packer. It will, however, prematurely begin to decay at the very point struck when dropped. To avoid this, and all rough handling between the orchard and packing house, the fruit may be packed under the trees when it is desired to have very particular work done. A light handcart, with a frame under the axle arranged to take five or six peach boxes and a platform above on which to wrap and pack the peaches, is needed for this work. The cart can be taken from tree to tree, each peach picked, and wrapped before leaving the hand and placed in the box. All overripe or imperfect fruit must be rejected. Even if it cost double to pack peaches by this method than in the usual way, it would be economy when they are to be sent to distant markets. Another plan is to line the boxes in which the fruit is to be placed from the tree with cotton batting, and cover this with old sacks or other cheap material, then insist that the picker carefully lay each peach in the box, and be never allowed to drop them even an inch from the hand. The peaches should never be emptied from the box, but taken to the packing house in a wagon, on which is placed a frame that will carry two or more tiers, that the boxes may never be placed one upon the other. The peaches should then be taken directly from this carrier, wrapped, and placed in the box for shipment. In haul-

ing fruit from the field, or to the depot, spring wagons should be used, and care should be taken to have the roads as smooth as possible. An injury to a single peach is liable to cause premature decay, and thereby render worthless a box of otherwise good fruit when a market is reached.

CANNING AND DRYING.

In favored locations, peaches are sold fresh at prices that would not justify the grower to can them, and only the imperfect fruit is dried. Peaches to can should be extra large and nearly ripe enough to eat. The rest of the crop may be dried. The peaches of California are much larger than those grown to any considerable extent in any other part of the world, and they can be sold in unlimited quantities at good prices if only the large and perfect fruit is properly and carefully canned. There is more discrimination made by the consumer between large and small fruit when canned than dried, and for such they will pay a greater relative price, consequently there is more profit in canning the largest and drying the smallest. The details of both canning and drying may be left to those engaged in these special industries, as it requires skill that can only be obtained by practice. Very good dried fruit, however, can be made at the orchard by peeling the peaches, sulphuring at once, and drying them in the sun. This is practicable in orchards where peaches are sold fresh, and only a small portion of the crop is to be dried.

PEACHES A NEVER FAILING CROP.

There are sections in California where peaches have never failed to make a profitable crop during the last twenty years. The foothills of the Sierras are particularly adapted to the culture of this fruit, where a paying crop can always be relied upon.

PROFIT IN PEACHES.

It is not now necessary to deal in theories regarding the profits of peach culture. Statistics taken from the books of orchardists that are fully reliable, are here given in proof of this statement. The fruit from an orchard of eighty acres (mostly peaches) has this year sold for $10,000 cash. The total expense of producing and placing this fruit on the market was $4,000, leaving $6,000 net profit. Only about one fourth of this orchard is in full bearing, most of the trees being only four years old from dormant bud. With many years of experience as a fruit dealer and grower, the owner expects to realize, when this orchard comes into full bearing, much better average profits than he gets this season. Another orchard of thirty acres yields $5,000, more than half of which is net profit. Another of fifty acres gives the owner $8,000. These orchards are all in the same neighborhood, and are exceptional only that they are planted to fruit adapted to the section. The net profits of these orchards will pay interest at 6 per cent on more than $200,000, making the value of each acre $1,250, while the orchards are only in partial bearing.

PLANTING AND PRUNING.

Essay by Mr. John Roch, Chico.

By your permission, I will offer a few hints on transplanting and pruning, and will try to be as brief as possible, so as not to tax your patience.

Nurserymen having received so much undeserved blame from the unsuccessful tree planter, whose lack of success has been owing chiefly to mismanagement, has led me to give a few ideas under the following heads:

First—Preparation of the Soil.—When you have made up your mind to plant an orchard, unless the ground is new, the land should be enriched by the application of fertilizers, such as lime, wood ashes, guano, or a heavy coat of well rotted manure. Very deep plowing is necessary; put on four or five animals, and use a good strong, sixteen-inch plow, and put it down to the beams; then follow in the same furrow with a subsoil plow, and put that down four inches more, and your plowing is complete.

In case the ground is inclined to be wet, it must be thoroughly drained. If you want thrifty, growing trees, prepare your ground well, and I assure you you will be abundantly repaid for your labor when your orchard comes into bearing. Dig the holes three feet wide and two feet deep. The trees should remain with the roots covered until this is done. Put no manure in contact with the roots.

Second—The Preparation of the Trees when Received from the Nursery.—In regard to this important operation there are more fatal errors committed than in any other.

Boxes or bales should at once be unpacked, the bundle separated and heeled in, as termed by nurserymen, which is done in the following manner: Dig a trench two feet wide and fourteen inches deep, set in your trees and cover the roots well, and do not take up more trees from the trench than what you want for immediate planting, and by all means do not expose the roots to sun or wind. Should your trees arrive late in the spring in a dried up or shriveled condition, lay them on the ground and cover them with straw, hay, or old sacking; wet the covering thoroughly two or three times a day; let them remain three or four days, then plant and trim the tops back well, and they will as a rule start and grow all right.

Third—Pruning at the Time of Planting.—In removing a tree, no matter how careful it may be done, a portion of the roots will be broken and destroyed. These should be pruned by a cut from the underside (not with a shear but with a good sharp pruning knife); having done this, lessen the top in proportion, for the demand upon the roots must not be more than they can supply.

A large majority of trees that are planted are not cut back half enough, thus pruning should be adapted according to the size, form, and condition of the tree. This enables the remaining buds to push with vigor, as it lessens the demand upon the roots. Close pruning will induce strong, vigorous growth.

CHERRY CULTURE.

Essay by JAMES E. GEDNEY, Mesa Grande. San Diego County.

Being requested by a member of the State Board of Horticulture to give my views on cherry culture at Mesa Grande, this being about the only section of this county (San Diego) where cherries grow to perfection, I cheerfully submit the following hasty description, only regretting that pressure of business will not allow of my going more exhaustively into the subject. For better handling the subject I have arranged the headings in the following general order, each of which I will treat separately, viz.: "Climatic Conditions and Rainfall," "Soil," "Location and Exposure," "Varieties," "Time of Setting Out Trees," "Time of Flowering and Ripening of Fruit," etc.

CLIMATE.

During January, February, March, and April we experience heavy rainfalls, averaging, for the four months, twenty-three inches, with light falls of snow during February and March. Our May and June are warm, with light showers, averaging two inches for the two months. The months of July, August, September, and October are warm and dry, with the exception of occasional light thunder showers from the middle of July to the middle of August. The weather of November and December is changeable, with fine falls of rain, averaging, for the two months, five inches; making an average yearly rainfall of thirty inches. This has been my experience during the past seventeen years, all of which time I have resided in this locality. Mesa Grande lies fifty miles from the ocean, and has an average altitude of three thousand three hundred feet.

SOIL.

The soils of this section are of many classes, but that which claims our attention is that best adapted to the production of the cherry. I have experimented with the soil of the lowlands, second bench, and hillside or slopes, and find the hillsides or slopes best adapted to the cherry, especially those having a northern or western exposure. These hillsides are rocky, no outcropping of ledges, but loose rocks from the size of a walnut up to quite large bowlders abound. The soil, when wet, is of a dark iron color, and when dry, a dark gray color, and consists largely of mica, iron, and decomposed granite, with an underlayer of a reddish clay; is very easily worked, and not inclined to bake.

VARIETIES.

Among the most satisfactory varieties of cherries produced by me are the—

Governor Wood	Flowers April first and fruit ripens last of May.
Rockport	Flowers April first and fruit ripens June first.
Black Tartarian	Flowers April sixth and fruit ripens June twentieth.
Napoleon Bigarreau	Flowers April sixth and fruit ripens July first.
Centennial	Flowers April first and fruit ripens June fifteenth.
Late Duke	Flowers May first and fruit ripens August first.

I plant my trees about the middle of February and find the best results by planting at this time. One reason for setting out the trees at this time is that the rains after this are not so dashing and heavy as to fill the newly

made holes with water, thereby causing the soil in the newly filled holes to run together and settle in one solid ball, which bakes and becomes hard during the summer months. The rainfall is sufficient after this time to so settle the newly moved soil as to exclude the too free passage of air to the young rootlets, which, of course, is very necessary. I buy my trees from any good, reliable nursery, one year old from graft or bud, and before planting cut off all bruised roots. Better a root six inches long and perfect, than one three feet long and mutilated, because the mutilated roots only draw upon the healthy ones to assist in furnishing nourishment to heal their (the mutilated roots) wounds. At the time of planting I head back the young tree to about eighteen inches, thereby securing large, thrifty shoots below that point. This low heading I find very satisfactory, as the lower branches protect the body of the tree from the sun's heat, thus preventing sun scalds, gum sores, and sap souring. I plant my trees twenty feet apart each way. My method is to plant thus closely, and then keep my trees low by cutting back every year; this facilitates gathering the fruit very much. I prefer this way to setting the trees further apart and allowing them to attain too great a height. By the former method, I secure fully as good, if not better, results per acre, to say nothing of the difference in gathering the fruit. Another advantage in keeping the trees headed low is that the winds do not affect them nearly as much as it does tall trees.

PRUNING.

I cut back in February two thirds the growth of the previous year. In this locality the cherry tree is inclined to grow large and very tall—say at four years twenty feet high. I cannot let them have nature's way, or else all I could do would be to stand at the base of the trees and look up at the too inviting fruit, and wish I had been raised by irrigation that I might have grown correspondingly tall, so as to reach the topmost branches. I do not irrigate my trees, nor would I if I had oceans of water at my disposal. Irrigation only calls for triple cultivation although portions of this coast will not produce without it.

CULTIVATION.

I plow my trees once a year about five inches deep. This I do about the first of April. The balance of the cultivation I do with an ordinary cultivator, and give the land shallow cultivation, generally three times during the months of April and May, and this ends the year's cultivation, unless the June rains should be sufficiently heavy to form a crust; if so, then I go over the ground once with a light, fine toothed harrow, which breaks the crust and leaves the surface mellow. This amount of cultivation insures moisture near the surface during the fruiting season. I use great caution in cultivating not to bruise or bark the trees, as the cherry tree does not heal so readily as many other varieties of trees, but is more inclined to gum and create running sores.

MARKET.

My market thus far has been principally at the orchard; cherry culture being comparatively a new industry in this locality, the demand from the neighboring cities and towns more than equals the supply. Customers from far and near come, do their own picking, pay their 11 cents per pound, load them into their wagons in shallow boxes, and go off happy, having

procured the rich, luscious fruit fresh from the trees, and as large and fine flavored as can be produced in any portion of the State. The varieties I have named stand transportation remarkably well. Packed in ten-pound boxes, placed in an ordinary ranch wagon, they arrive in good condition after a trip of sixty miles over rough mountain roads. The Napoleon Bigarreau, in particular, is a fine shipper, and I think it will stand more punishment, and for a longer period, and then come out in better condition, than all other varieties that I am familiar with. I would recommend the planting of this variety in all sections where it does as well as it does here, not only because it is a good shipper, but on account of its immense size and luscious flavor. The Black Tartarian, Governor Wood, and Rockport are standard varieties, too well known to need any comments from me. The Late Duke I consider a valuable variety, ripening, as it does, early in August, after all the varieties are gone, it, of course, commands a higher price. Its real value, however, is as a pie fruit, either canned or fresh, as it is a very acid cherry.

PESTS.

The only pests I have to contend with are the gopher and borer, both of which I keep pretty well under subjection. The former I make away with by shooting, trapping, etc., and the latter I protect the trees against until they are old enough to resist the attacks of the borer. I use a thick mixture containing, among other things, crude carbolic acid pretty well diluted, and this I apply to the young trees once a year, by rubbing up and down with my hand for the distance of a foot or more from the ground. This forms a thick coating, which the borer does not penetrate. When the tree gets three years old, it is old enough to resist the attacks of the borer.

PROFITS.

A word as to the profits of cherry growing with me. I have one hundred trees four years old from planting in orchard, making five years from bud or graft. These trees this year produced an average of fifty pounds per tree, which I sold at 11 cents per pound on the tree, making $5 50 per tree, and at the rate of one hundred trees per acre, a revenue of $550 per acre is realized and no expense of picking, packing, or transportation. My older trees of course yield more than double this amount. I feel that I am guaranteed these prices for years to come, as it is well known that but few localities in Southern California will produce the cherry in perfection, while the population is increasing very rapidly, and all the tenderfoots settling and making homes in Southern California bring with them their cherry tooth. They cannot all or any great portion of them make homes in the cherry belt, as that is limited.

This locality, Mesa Grande, is, up to this time, the only portion of San Diego County noted as a cherry-producing locality, while the county at large is not only capable, but does produce the greatest variety of fruits of any other county on the Pacific Coast, ranging from the orange and lemon on the coast, to the late winter apples and pears back in the mountains. But I am not penning this as an advertisement of the county, therefore pray excuse a deviation from the main subject.

To conclude with, I would recommend the propagation of the cherry in all sections that are adapted to their production, as it is one of the most profitable fruits in cultivation, and always finds a ready market. My cherry orchard consists of four hundred and fifty trees, about three hundred in bearing. The planting of the cherry is becoming more general at

Mesa Grande now, and neighbors are setting out trees, and more are contemplating planting the coming season. I think the altitude cuts but little figure in the production of the cherry; it depends more on the quality of the soil and a sufficient annual rainfall, say an average of thirty inches per year. Plant upon well drained hillsides, no matter how rocky, providing it is not too rocky to cultivate. These rocks keep the soil loose, and the heat they gather through the day is thrown off at night, keeping the soil warm.

Give the trees no irrigation; at least that is true in Southern California, where the soils are too dry to produce without the application of water. All who have tried have failed to produce cherries with irrigation. The tree grows and flowers from three to five years, but never ripens fruit, and usually dies at the end of five years, or before.

DISCUSSION.

Dr. Kimball, of Haywards: Pruning is as different as the individuals and the knives and the shears; as the individual father trains a son or a mother a daughter, just according to their ideas of development and government, just as diverse is the training of fruit trees. I have engaged in the fruit business a great many years, and have trimmed a great many trees, and had them trimmed under me, and I never have seen two trees trimmed exactly alike. Notwithstanding this diversity there is generally very good results, except in extreme cases of either too much cutting or too little cutting. I think, though, in most cases with the young orchardist, the greatest mistake is in trimming too little; it is like Solomon sparing the rod and spoiling the child; if you spare the knife, if you are too merciful, you spoil the future of your tree. For the first few years of the tree the development should be in the line of training that tree in the best possible condition of growth to bear the greatest possible amount of good fruit. To accomplish this the methods in use are as diversified as two characters; we never can make two blades of grass grow alike, never can make two things of any kind grow exactly alike, so there can be laid down no definite method.

Mr. A. T. Hatch, of Suisun: I have seen Mr. W. W. Smith's trees, and seen him prune them, and seen the results year after year; of course, no two trees can be exactly alike, but a person traveling along the road by his trees could readily imagine they had all been trained out of the same mold, and not the same men did it, either; many men have done it at different times; some have trained them one year, and maybe the next year was different labor. There are many orchards in this State that are pruned very regularly, and sometimes by the lowest grade of human nature. I understood from some article about pruning that the cone or pyramidal form was recommended. There has been adopted the pyramidal form in California, but the largest part of the pyramid is up and tapers down to a point at the butt of the tree, reaching about a foot from the ground; that is found by most people interested in fruit growing to be the best plan. The young tree when planted cut to twelve, fourteen, or sixteen inches, and that season let two or three or four branches grow—three is the best; it don't matter how high they grow—the higher the better; cut them down again at least two thirds of their growth on most of our trees, such as peaches, apricots, nectarines, cherries, and pears. The next year allow two to grow on each of the three or four branches that are left; that is, in pruning the next time, leave but two upon each one, and upon that the same again, two more, leaving the tree in a measure open, or a hollow

cone. Some trees require more pruning than others in proportion to their growth; the peach is one of that kind. The apricot the third year may be favored, if you may call it so, by leaving a great portion of its growth, because that year it will not produce fruit, and by being so left it will produce fruit buds for the coming season, and the next year it will produce fruit worthy of consideration; the next year following that there should be but very little of the growth of the tree left—say, not more than six inches to twelve inches of that growth; that is to bring it within bounds, and having it of the size you would like it to be, and that strengthens it. It is not too withey by being then brought under the knife and reduced. I did not intend to speak about the different kinds of trees, but this is a general rough idea of a tree, and most all the trees that we plant of the deciduous fruits will come under that system, including peaches, apricots, nectarines, cherries, plums, prunes, pears. Almonds, after the first two or three years, should not be pruned at all, unless the limbs drop down when you cut them off, and trim out the branches that are rough; but the peach tree, as some one said here to-night, cut severely; a peach tree is cut severely until it becomes necessary to cut it out of the ground. Those who would let a peach tree grow its own native growth and leave it there, thinking of the great crop of fruit it will bear, make a great mistake. It is inferior of fruit; even if they thin it well, there is then too much fruit. They must cut it back, and then thin those that they leave, and it must be done every year, and even after having done that, after six or seven or eight years, it would be advisable to go and cut it back two thirds of the last year's growth and all that would be left of those years.

Mr. Gray: One word to Mr. Butler. I understood him to say that most orchardists now set out their trees from eighteen to twenty feet apart. I think that that is a mistake, at least in this section of the country; it may do on poor soil, but if we want to go through the rows of our trees in this part of the country we must put them at least twenty-five feet apart, and then we have to dodge around to get the fruit out. I think that that is a mistake that should not go out to the young fruit growers.

Mr. Hatch: As to that point several have asked me at different times what distance I would recommend for planting different varieties of fruits. I have stated it in two ways: first, to those who have plenty of money that do not need them in the near future for their support, plant apricots, almonds, and cherry trees not less than thirty feet apart; if a man needs the best results he can get in the near future, he may plant them closer, twenty-five feet; but no peach tree on land such as you have here or anywhere in the rich valleys should be planted nearer than twenty-five feet. I have peach trees that at six years old were too close at twenty-five feet apart, and two thirds to three fourths of the growth each year cut out.

Mr. W. W. Smith: Will Mr. Butler state the variety of peach he shipped in May?

Mr. Butler: We shipped the Early Alexander; the twenty-third of May there was forty cases went out, and I shipped thirty-five of the forty. They paid me for those peaches $2 a box, and continued to pay $1 75 for some time. I spoke of the distance at which peach trees were generally planted, and still entertain the idea that I am correct about that, using the word generally; there are certain sections of this State where no general rule will apply. This place and the places these gentlemen speak of where the wood growth is very great I agree with them that twenty-five feet is near enough to plant peaches, but in our section eighteen to twenty feet is the distance at which peach trees are planted, and I am sustained by that entire community in the expression of that opinion.

Mr. Hatch: I would like to ask Mr. Butler what number of tons of peaches, per acre, do you call raising peaches for fruit?

Mr. Butler: The quantity we get there from an orchard in full bearing is from four to six boxes a tree, and it is only from one hundred to one hundred and twenty-five trees to the acre; that would be about one hundred pounds to the tree. Now of course there are exceptions to that rule. We irrigate there in growing peaches, and along my main line of ditch some of my trees this year yielded from ten to eighteen boxes per tree; and the average of ripe peaches would be at least six boxes. I know there is some parts of the State where they get a larger yield; I am only reckoning on what we ship. There is a demand for peaches grown in that section, and ours is the last point on the railroad from which they ship.

Mr. Hatch: I want to ask Mr. Gray how many peaches they get per acre?

Mr. Gray: I don't want it understood to be in a bragging way at all, but we have picked three hundred to three hundred and fifty pounds from four-year old trees several times; that is, in quite large numbers, from the same orchard.

Mr. Booth: I think I can answer the question as to the whole amount that comes from the acre, because I have weighed a great many tons from my place in Placer County—I have weighed from twelve to fourteen tons to the acre.

General Chipman: There are two points presented in this discussion upon which I want to say a word. I am a young planter, and the nurserymen told me to plant twenty feet apart in the catalogues; I did not think they wanted to sell me twice the number of trees to the acre, and I don't think they did, but I made a grievous mistake. I have got one hundred and fifty acres of various fruits planted twenty feet apart, and I believe I would give $100 an acre if they were thirty feet apart; it is too late to remedy it, and I want to grow trees for wood and fruit both. Now, on the question of cutting back the first year, Mr. Butler says sixteen inches; I have spoiled part of my orchard by following the rule which was introduced here of cutting to the knee, which was about sixteen or eighteen inches. I think it is a mistake to have a tree branch out above twelve inches from the ground, and a very great mistake. It is made by young planters very persistently; it is made in that very intelligent orchard across the way. I passed trees to-day that had better be grubbed out four or five years old, a mistake which ought not to be made four or five years ago by intelligent orchardists in this State. There are trees there branching out on an average three feet from the ground. I think it is a very grievous mistake and I want to emphasize it, as it has been brought forward here in the discussion, and to my mind it is one of the fundamental mistakes. It begins in the first year, the very time you plant your tree. I have gone out to young orchards in my vicinity where the eastern man has come in with his old fashioned ideas of walking under the branches, and having his picnic under the apple trees, and I could not make him cut them down. The reasons are so obvious that it is hardly necessary to occupy the space of your record; to some eyes the body of the tree is protected from the scorching sun and the heat of the valley. Second, the fruit is within reach. Third, the system of pruning, which goes with that, enables you to keep your tree in a better shape; and fourth, you get more readily the moisture from the ground; you don't have so far to travel to get to your fruit, and in that way you have superior fruit. I want to emphasize this to the young planters who come from the East, in order

that they may not be discouraged with fruit growing here, to see that they do not make this fundamental mistake of starting at eighteen or twenty inches from the ground.

MR. HATCH: One word about the *quincunx* form of planting a tree. Several years ago I started planting on that plan, and before I found out that I had not made much I planted about four hundred acres, and it would be a great benefit to me if any one would tell me how I could thin those trees. I planted them a little over twenty feet apart, and that was further than I was advised. First, I was told fifteen, and I planted at sixteen, and then I got twenty and a little more. The oldest I planted are apricots; they have been planted five years, and the last two years they have been pretty close, so that they have not given half a crop. There is no way that I can figure it up that I can thin those trees excepting to take out alternate rows, which would put them over forty feet apart one way and twenty feet another. If they had been planted in squares I should take out alternate diagonal rows and leave them equal distances.

DR. PECK: I only want to say two or three words for those of us who live up in the foothills on the granitic soil and plant our peaches on the hillside. Take the advice of the valley growers, and you will make a terrible mistake, and if the valley farmers take our advice they will make a mistake. There is no comparison between our lands and your lands. Mr. Butler is absolutely correct—eighteen or twenty feet apart for peaches with us is far enough apart. We claim that we can produce good peaches, and we do grow good peaches, for they bring us a good price, and those who are cultivating peaches get rich, rich enough for common folks; and if they would plant their trees twenty-five or thirty or forty feet apart, they would waste their land; there would be no practical good result.

MR. W. W. SMITH, of Vacaville: As my place has been referred to, I would like to make a few remarks on the subject, of pruning more particularly. I do not think that that subject has been exhausted, gentlemen; it is one of the most important subjects connected with fruit growing, perhaps the most important. I think in our section we pursue a somewhat different course in pruning from what Mr. Roch does. From his essay I understand that he practices what they call the pyramid, trimming the tree in the shape of a pyramid. Is that your method of pruning?

MR. ROCH: No, sir; not at all.

MR. SMITH: In our section of country, in Vacaville, we prune our trees in the shape of a vase, or conical; a tree with a hollow center, that admits the sun to come into the center of the tree and throws your fruit on the outside, to the circle on the outside of the tree, so that it all ripens up pretty much alike, and you can pick it without much trouble, and there is but very little of the fruit goes in the shade. The sun and air in this country are essentials to the full development of our fruit, especially the peach and the apricot. We take a one-year old tree from the bud or graft, a straight switch, as some of our trees are as they come from the nursery. You all understand what a one-year old tree is as they come from the nursery. We like a straight switch, without any side branches. After the tree is set out cut off about a foot from the ground; just cut the twigs right off; leave a little stick about a foot high. In setting your trees, in handling them, and taking them from the nursery, always take care not to rub the buds off near the ground. I will give you a reason for that directly. After the tree is set out, and after you prune it—the growth begins in the spring of the year—when the tender shoots begin to be budding, about the length of your finger, go through the orchard and pinch back the terminal bud there of all branches that start, except about three—three, or four, or five. Best

divide it so that you can get around the top of the little stick that sticks up there.

You can go out in General Bidwell's orchard and you will see that the sap certainly has the most powerful tendency to the top of the tree, and so the most rapid growth is always in the top of the tree; when your little tree is cut off after it is set out, the sap goes to the top bud; you ought to be careful in rubbing the buds off, because those buds are the ones that form the future foundation of your tree, three or four or five of them near the top; the sap goes forward to the top, and those buds will start first; some buds below those may start, if they do, pinch them off; don't strip it off but pinch out the tender bud and leave it there two or three inches long, and that will check its growth, and a large portion of the sap will go into the top bud, the one you want to remain there, to form the future head of your tree; let that go, let them all, do not disturb them during the whole summer; but of the ones below, if those should start again go through and pinch them off again, it is not much work—they will remain on the tree, will form a shade to protect the tree from the heat of the sun.

By training it in this manner it will cause the stock to increase in size, and make it more stout and stocky, and will be better prepared to stand up under the weight of the tree in the future. During the winter after the first summer's growth prune off all those to three or four branches down to about eight inches, leave them about square about eight inches out; then you have your straight stalk with three little branches, eight inches long at the top; that is your tree after it is pruned the second year; next summer let two branches grow on each one of those three or four, as the case may be, near the top. Be careful to cut to an outside bud if you want to spread your tree; if you want to draw your tree in cut to an inside bud; you can all see the reason for that, I think. During the second summer, when you have got your tree with four or five branches started, let two grow on each one of them, pinching back all below those; that is easy, quick work to go through, and pick off the tender buds; let those grow all they will, the more the better. During the next winter cut these all back again to about fifteen inches, then you have got your tree with a main branch, and your three branches, and your six branches. During the next winter cut those six branches back to fifteen inches high, and each one of them will grow out two branches again; if they put out more, pinch them out; you can do it in summer a good deal easier, economizing the growth, economizing the sap, and doing it as you want it, not letting it all grow out, and then throw it away, but you get it when you want it, and utilize it through the season, and through the winter cut them off, and let the tree start again, and then you have your tree with a foundation and three branches, six branches, and twelve branches, more than that is unnecessary; then follow that up the remainder of the life of your tree; so far as that is concerned, you can carry it out to any extent.

After that cut away about two thirds of last summer's growth during the winter, and when your tree is four years old and upwards, you will then have altogether too much fruit on it if it is a peach, or an apricot, or a plum particularly, any of our pit fruits. The next thing is to go to work and thin that fruit off. Go to work and pull it off with your fingers when it is about the size of the end of your thumb. A practiced man will thin them very fast. I have a Chinaman on my place that can pull them off faster than a man can count them. The rule that I give my man is to let no two peaches, or plums, or nectarines grow closer together than six inches on the same branch, and in the majority of cases the trees will then have too much fruit on them. I thin my peaches the third time, some of

them, and then the trees break down, but then we had an unusually heavy crop of peaches this year.

Now, I cannot advocate the pyramid plan of planting; a tree trimmed in that shape a leader will throw out branches the entire length of this main stem, and the outside branches will shade the fruit nearer the body of the tree and, by the way, in that way the branches will grow out nearly horizontal, and you cannot get your stepladder or your arms in toward the center of the tree to pick the fruit, the branches are in your way; whereas a tree trimmed in this shape, with a hollow center, there is no difficulty in getting your stepladder up and getting all the fruit. The other way the fruit grows in the shade; it is separated from the sun and air; it will not do as well; it will not color up as well; it has not the flavor that the fruit has grown in the other kind of a tree. I have practiced both methods, and almost every other method of pruning that I have ever heard of in this country, and this base of gambrel form gives me more satisfaction than any other I have been able to discover. I heard a practical fruit grower say the other day that in California we had been in the habit of pruning our trees the wrong way, that they begin at the ground and cut up, and we ought to begin at the top and cut down. There is a great deal of practical common sense in that remark. We have all been in the habit of pruning our trees too high; the nearer we can get to the ground the better, and we must prune so as to give them as much air and sun as possible; and I want to urge the importance of this if we want to raise large, highly colored, well flavored fruit. And that is what we want if we raise fruit for money, and I do not know a man that does not.

Another point: The trees at Newcastle and vicinity do not make the growth that they do in the rich valley lands, consequently there they can plant trees closer together than those in the valley. Now the best rule that I can give—or would give if I were asked for a rule—is this: Owing to the climate, the different circumstances, the different changes of climate through the State—for in many places the climate changes within a mile—the new beginner should observe closely what does best in his own locality, and then practice from that. If pears do well in your locality and peaches do not, plant pears; and so with other varieties. You must learn this from observation; these things do not come without hard study. What little I know of fruit growing I had to study out in the orchard. I had no teacher, as many of you have now, other than A. J. Downing's "Fruits and Fruit Trees of America," and a large majority of his writings do not apply to this coast. Some of the best fruit growers in the Eastern States—in fact I may say the best—B. Barry, of Rochester, New York, when on the Suscol Ranch, in Napa, admitted that it was almost impossible to identify even the most common varieties of apples in this State, and found great difficulty in recognizing the Yellow Bellflower there, and was not certain then.

I mention this, gentlemen, to show you that no definite rule will apply throughout this State, as it does in the Eastern States; each man must study his own locality, and plant the fruits adapted to that locality.

PROFITS OF FRUIT RAISING.

WHAT VARIETIES TO PLANT, AND HOW TO PLANT THEM.

Essay by MILTON THOMAS, Los Angeles.

In coming before you to say something in regard to the present and future of the fruit industry, I shall try to show some of the various ways and the different processes of preparing and marketing our fruit. In this brief way I cannot refer to all the products of this wonderful industry, nor the various avenues that are likely to open for the disposal of the fruits of California.

The possibilities of the fruit industry in California are beyond our most sanguine expectations. Let us look at the various ways in which our fruit can be used. Let us look at the subject briefly.

I shall take up the subject of horticulture in the broadest sense, making it include all the fruits that grow and do well on this coast.

FRUITS IN OLDEN TIMES.

In taking a retrospective view of the various fruits that were grown in California in 1849 and 1850, we find there were only a few kinds, and those of inferior varieties, except grapes and oranges. The Mission grape was about the only foreign variety grown at that time in California, and it was considered quite a luxury to the miners and others who came here at that time. It is still a good grape, but since that time there have been introduced from Europe very many other varieties that excel. In the same years there were a few orange trees grown in Los Angeles County. I remember in 1869 being shown a few old trees, at the old Mission San Gabriel, that were eighty years old, still in a good state of preservation, and bearing well. These old orange trees and the Mission grapes introduced by the Catholic fathers probably over a hundred years ago proved a success, and led to others being planted, and we are indebted to-day to these Catholic fathers for these fruits. There are also old seedling pear trees at the Mission over one hundred years old. The first grafted fruit trees were brought to California in 1851, 1852, and 1853. Fruit trees at that time were $1 apiece, and the fruits were sold from $1 to $2 per pound. But this was in the golden days of California, when mining was the principal industry, and men made $10, $12, and $16 per day. As time passed there were more fruit trees planted, nurseries established, and the price of trees and fruits diminished, and before railroads reached our coast the price of fruit was not remunerative, and orchardists lost their interest in fruit raising, and it was some years before fruit was shipped East with profit.

Porter Brothers, of Chicago, commenced to ship fruit East in large quantities several years ago; then others commenced. Finally one thousand or more carloads of green fruit were shipped in a year. It was not always a success, especially if the market was glutted or the fruit was received in poor condition. The freight per car was $600 to $900, whereas now it is but $200 to $300; so you can see that the fruit industry in the past was not always profitable.

FRUITS AT PRESENT.

We find at the present time it promises to be one of the leading industries in California. There is no country in the world that can compete with us when we take into consideration the various fruits we can grow to perfection. Let us contrast the countries that produce tropical and semi-tropical fruits. Can they produce apple, pear, peach, apricot, nectarine, prune, plum, etc., and other fruits and nuts that we can produce in such quantities, and the quality being first class? We say no; not by any means. We produce the best of semi-tropical fruits, and our deciduous fruits cannot be excelled, taken as a whole. We see growing in the same orchard orange, lemon, pear, apple, peach, apricot, walnut, almond—also the strawberry and other small fruits, as well as the best foreign grape that grows anywhere, with more tons to the acre than any other portion of the world. We defy the world to excel in quality or quantity. Our peaches can be used for drying and command good prices, as do also evaporated. Evaporated peeled peaches command fancy prices. In this connection allow me to allude to a cheap and novel way to peel peaches. Simply put the peaches in a weak lye, and let them remain in it about a moment, and the skins will slip off by plunging them into cold water. This being such a simple process every one should try it. Now, as to canned peaches, there is a good market in the East and Europe; besides, vast quantities are consumed in Great Britain. There is no question but what there will be a good and certain market for all peaches that can be produced in California.

Then next let us consider the apricot, which is one of the best of fruits. Eaten when ripe it is delicious, and it cannot be surpassed in flavor. It is most conducive to health, and on account of its acidity is in great demand in cold countries and on shipboard, and especially on long voyages. Canned apricots will always be in demand. The dried apricot is, perhaps, the best dried fruit we have. The evaporated apricot commands the highest price in the best markets of the world. There is one thing, perhaps, which is not generally known, that there are but few places in the world where the apricot can be produced. California is the best apricot-producing section known. Taking the apricot in its various uses, it is, perhaps, one of the best known fruits. There are few people in the world who have tasted this luscious fruit.

The nectarine is a fruit especially good for drying or canning. It usually does well in California wherever the peach succeeds—that is, the red or colored nectarine. The white or light-colored nectarine is a shy bearer. The nectarine promises well, and in the future may be a good fruit to raise.

I will allude to the English walnut as being very profitable. There are several walnut groves in this State which have netted their owners $200 per acre the past year. The walnut requires good, deep, rich soil, and but little pruning and irrigating. The English walnut comes into bearing in about ten years, and the soft-shell at about six years. The almond is a tree that grows well, and under certain conditions is profitable. In order to have trees bear well you must plant different varieties close together, in order that the different varieties may fertilize each other when in bloom. The experiment has been tried in different localities in the State, and the result has always proven satisfactory.

I now wish to call the attention of those intending to plant the cherry to the fact that they require no irrigation. The branches should be allowed to grow out at about a foot from the base of the tree.

PRUNING.

As to pruning apple trees, suppose you plant one-year old trees. After they are properly planted, cut back to three feet in height, then allow the tree to send up shoots above eighteen inches, and rub off all below. Let the branches start all round the tree in the form of a pyramid. Second year, cut back, say one half; third year, the same, and after that, less. Keep all suckers and superfluous wood thinned out, so as to admit sunshine. Pear trees require more pruning; cut back the same as apple, only more vigorous pruning is necessary, cutting back, say two thirds year after year, and endeavoring to make the branches stocky, so that they will not break. The apricot requires still more pruning, as it is a wonderful grower, and it must be cut back three fourths to five sixths, thus allowing the small twigs to remain on the tree to bear fruit. The apricot requires vigorous pruning each year. The peach does not require so much pruning; cut back some the second year, and keep all new wood cut away that grows out from the base; in fact, keep all brush out, and keep the tree in symmetrical shape. This same rule applies to nectarines as well. Walnut and fig trees requiring little pruning. In this connection let me urge every one to plant one-year old trees, and to prune vigorously when first planted, remembering the more you prune the better your trees will grow.

SOIL.

Now as to soil. Apple, cherry, pear, and walnut trees need the best soil; peach, plum, prune, and nectarine will grow in soil more sandy, also orange and lemon trees. Small fruits do well in sandy soil, but be it remembered that all trees do better on rich soil, but some do better on a lighter soil than others.

IRRIGATION.

Now a word about irrigation. Orange trees require irrigating regularly, say, while young and before they come into bearing, once every two months in the dry season, and every four to six weeks after they come into bearing. Lemons require but little water, about twice during the dry season. Deciduous trees do not require irrigating in ordinary seasons and under ordinary circumstances.

PLANTING.

Before planting plow the land eight to twelve inches deep, or deeper if you can afford it. Harrow and pulverize the land thoroughly. Dig the holes about twenty inches deep; place the roots in and spread them out, and when filling the hole put the top earth in at the bottom and vice versa, and press the soil firmly until the tree will stand erect, and if you have the water irrigate the trees so as to settle the soil around the roots. I will say that in some localities where the atmosphere is dry, that trees require more irrigating. Now, as to distance apart to plant fruit trees, twenty feet apart will answer every kind of tree, except orange, apricot, and apple, which should not be less than twenty-five feet. English walnut, forty feet; almonds, twenty-five feet; blackberries, raspberries, currants, and gooseberries should be six feet apart; strawberries, two to three feet. Grapes of all kinds will produce more tons per acre, after six years old, if they are planted ten feet apart, than if they are nearer. I wish to emphasize this as a fact that can be and has been demonstrated.

Now there is one other thing I wish to refer to, and which I deem of great importance, and that is thinning out the fruit on fruit trees. No fruit should be allowed to grow nearer than three inches to each other, and all small and defective fruit should be picked from the tree.

THE RAISIN INDUSTRY.

Let us now glance at the raisin industry, as being one of great importance and which has perhaps the greatest outlook for the future of any other. The possibilities of this industry are beyond anything we can conceive of. Some twelve years ago there was an attempt to make raisins, but it was not a success, as is usual in all new enterprises. There were many discouragements met with by those who were interested in this enterprise. There was a prejudice, not only in the East, but at home, but there has been a steady increase in flavor and output, and California raisin makers have used every precaution to make their raisins palatable as well as attractive to the eye. Wrapping, packing, and boxing, and in fact everything connected with this industry is well done. The many difficulties encountered have been boldly met and overcome. We have a climate preferable to that of Spain, and in the near future we will supply the demand for first class raisins. If California raisin makers will keep on in the same ratio in the future as in the past, making improvements in flavor as well as general attractiveness, they will be able to successfully compete with any raisin made in Spain or elsewhere.

Small grape growers find it to their advantage to sell their raisins in the sweat boxes to those who have made a reputation for their brand. We perceive that the output for raisins has steadily increased. In 1881, ninety thousand boxes; 1882, one hundred and fifteen thousand; 1883, one hundred and twenty-five thousand; 1884, one hundred and seventy-five thousand; 1885, four hundred and seventy-five thousand; 1886, seven hundred and three thousand. We have the following brands, and most of them are very fine: The Forsythe, the Coleman Flag, Riverside Packing Company, McPherson Bros., the Austin brand, and George W. Meade, the Lion brand. These different brands have sold side by side in New York, Boston, and Philadelphia, with the imported raisins from Malaga, and compared very favorably, and the merchants were loud in their praise of the California raisins. There is another advantage that California has in her raisins, that they do not deteriorate after the first of April. The Malaga profits in producing and making raisins are sufficient to satisfy almost any one. One hundred to two hundred dollars per acre ought to be sufficiently remunerative to the raisin maker. The variety of grapes used are mostly Muscat and a few Malagas; some Sultanas are used, a seedless grape.

In 1884 there were imported to the United States over fifty-three million pounds of raisins. Now, we will notice briefly that the Malaga raisins come from Malaga, a small province of Spain, on the Mediterranean Sea. It has an area of four thousand seven hundred and twenty-nine square miles, and its surface is mountainous, being traversed by the range of Sierra Nevada, and only a part of Malaga is used to produce the Malaga raisins. A part of the grapes are used for wine making. Let us see what they pay laborers for making raisins. For men, 25 to 30 cents per day and board; women, from 12½ to 20 cents and food furnished. In packing, men get 50 cents per day, and women, 25 to 30 cents, and furnish their own food. One American would do more in one day than these would do in three. Now, we will contrast the yield of our vineyards with those of Malaga. Our vineyards, in full bearing, yield from eight to ten tons per acre, and in Malaga

less than two and one half tons—four pounds to each vine, one and one fourth pounds of raisins to each vine. The seasons in Malaga are uncertain. In 1884 it rained two days in September, and seven days in October. This year it rained one day and two nights. The principal grape they grow for raisins is the Muscatel, the same as our white Muscat of Alexandria, and it has been there from time immemorial. There are other places where raisins are made beside Malaga. There is a province near which makes an inferior raisin.

CANNED FRUITS.

The output of the canneries for 1886 was six hundred and fifty-nine thousand nine hundred and fifty cases of fruit, twenty-two thousand and five cases of jams and jellies. Allowing forty-five pounds to the case, this equals a total of thirty million pounds of canned fruits. The three leading fruits continue to be apricots, peaches, and Bartlett pears for canning. The putup for 1886 being two hundred thousand cases, against one hundred and ten thousand for 1885, of apricots; one hundred and thirty thousand cases of peaches in 1886, against seventy thousand for 1885; and of pears one hundred and twenty thousand cases, against eighty thousand for 1885. Two hundred and seventy thousand more cases of canned fruit were put up in 1886 than in 1885, and are mostly sold, and good prices paid for the fruit.

CRYSTALLIZING.

I interviewed Mr. Benedict, of the firm of Bernard & Benedict Fruit Crystallizing Company. He said that all fruits can be crystallized. The best fruits for crystallizing are the orange, apricot, nectarine, cherry, fig, muscat grape, pear, and plum. For marmalades, jams, and jellies all the fruits just mentioned, except the cherry, may be used. The peach may be largely used for marmalades. Mr. Benedict also said that small fruits, such as blackberries, raspberries, strawberries, etc., may be used in any quantity, and yet always find a ready sale at good prices. But of all the fruits grown in California the fig has the greatest future. We should at least supply the demand of the United States. The variety I would advise to grow are the white varieties. There are annually imported from foreign countries vast quantities, which we should produce. Mr. Benedict further says that there is practically no limit to the amount of figs that can be disposed of at good prices when prepared by crystallization or dried in a manner to compare with the imported. The guava, he thinks, will become of great importance when properly cultivated. In the shape of jelly, it has largely been in demand amongst epicures, and in this way and in the shape of crystallization can be sold at good profits. These gentlemen have experimented with various fruits, and have succeeded in a way that is beautiful to the eye and delicious to the taste. The fig is prepared by this process, and the demand is wonderful. There was a firm in New York which ordered a sample, and as soon as it was received and tasted they ordered every few days by telegraph. A syndicate was formed, and they were going to order a carload, but of course Messrs. Bernard & Benedict were not prepared to fill their order. Their crystallized apricots are perfectly splendid in taste as well as in appearance, also the pear and strawberry. Then the Muscat grapes when crystallized are the best and most palatable of any. I cannot in this allusion to this most important industry do justice to it. Bernard & Benedict have orders for the next season from every house that has already received samples. They have also a new process for drying apples that makes the product so far superior to the best evaporated apples

that there is no comparison in appearance or taste. Their jams, jellies, and marmalades, also syrups, are far superior to all others. What is the outlook for pears? Let us look at it for a moment. Just see the demand there is for pears in the East. First, our pears are far superior, and can be sold in the East some time before their pears are ripe. They can also be picked some time before they are ripe, and will ripen in ten or fifteen days, or about the time they arrive in the eastern markets. Then our Bartlett pears are not only shipped East, but are canned to a large extent, and are sent not only to the East, but to Great Britain, and some to Europe and other countries; and besides this they can be dried and command fair prices. Then they can be crystallized, and there is a demand for them that is difficult to supply, as at present the supply is not equal to the demand at all.

PEARS.

As far as pears are concerned, we can sell all we can raise for many years. In fact, there is no glutting the market if they are properly distributed and sold at a price that people can afford to give—not 10, 20, or 25 cents a pound, but retailed to the consumer at 6 cents, which will allow the producer a fair price, pay the freight, and leave a margin besides.

PRUNES.

One word as to overproduction of prunes. There is no reason why California cannot produce the sixty million pounds of prunes, instead of having to import them. A prominent horticulturist of San José, who has a large orchard of prunes, said he could raise prunes and dry them, all ready for the market, at 5 cents per pound and make a net profit of $100 per acre. There is no immediate danger of it, but if the price is ever reduced to that figure, then, instead of there being a demand for those sixty million pounds of prunes, besides what we already produce in California, there would be a demand at that price for two hundred million pounds. This holds good for all other fruits. If they are cheap, then there would be vast quantities consumed.

APPLES.

In regard to the apple, there is much to say. The origin of the apple is not known. The apple is mentioned in the Bible, but it was not the apple that we have to-day. Pliny says there were twenty-two varieties known to the Romans. We have several hundred varieties. Downing says, "The apple is the world renowned fruit of temperate climates." The growth, size, and quality vary in different localities. Some apples are adapted to one locality, and in others will not succeed at all. The apple is better known than any other fruit, and, all things considered, is the best fruit known. As a food it can be compared to bread and meat. Its use is conducive to health, and it can be used in various ways. Vast quantities of this fruit are consumed, furnishing a good and wholesome diet for the millions. In fact, it is hard to say too much about the apple as a food. The varieties of apples I would recommend are the following: White Winter Pearmain, Yellow Newtown Pippin, R. I. Greening, Ben. Davis, Jonathan, Yellow Bellflower, Smith's Cider, Fall Pippin, Skinner's Pippin Early Harvest, and Red Astrachan.

PEACHES.

Of peaches, these varieties: Early Crawford and Late Crawford, Orange Cling, Lemon Cling, Golden Cling, Foster, Hale's Early, Alexander, Morris' White, and Early Strawberry. Of apricots, these: Early Moorpark, and Royal; Hardwicke Nectarine. Pears: Bartlett, Winter Nelis, Beurre Hardy, Easter Beurre. Prunes: French and Hungarian. Plums: Damson, Yellow Egg, Green Gage. Orange quince, Washington Navel orange, and Eureka lemon. Kittatinny blackberry; Cuthbert raspberry. Strawberries: Monarch of the West, Crescent Seedling, and Triumph of Cumberland. Table grapes: Muscat of Alexandria, Black Morocco, Black Hamburg, Malaga, and Rose of Peru.

ORANGES AND LEMONS.

I see nothing to discourage any one from raising oranges and lemons. The cottony cushion scale will be confined to certain localities and eradicated ultimately, if the people persevere with extermination. Our oranges come in when we will have no competition and the freights are being reduced. If they are properly distributed they will bring a good price, besides our oranges stand transportation better than any other. If our oranges sell for remunerative prices, that proves that we produce a good orange, as we have to compete with the best grown elsewhere. One dollar a box net will pay the producer. The Orange Growers' Union, which has been so successfully organized, will put $200,000 more money in the possession of the orange growers, than if there had been no organization effected. The same result will follow in the central and northern part of the State.

FRUIT GROWERS UNIONS

Are destined to be of incalculable benefit to fruit growers of California, and also to dealers and consumers in the East. The fruit will be distributed so that no place shall be glutted. During the last year there were but few cities where our fruits were shipped, comparatively speaking. When our fruit is properly distributed throughout the United States then it will be demonstrated that we do not have one tenth the fruit to supply the demand. Our population is increasing about one million a year, which means fruit for one million more. In the next decade there will be sixty million people. The more of our fruit that is consumed, the more will be wanted. If those engaged in the fruit industry will eradicate the insect pests, take good care of their orchards, cultivate the very best kinds and varieties, they must reap a large reward.

We wish to particularly emphasize the importance of planting but few kinds and varieties. A great mistake is made by the majority in planting too many kinds and varieties. Then, if the fruit is put up in an attractive manner, there will be a market which will pay the producer a handsome profit, with a far better business than in any other legitimate enterprise and a very pleasant employment. There is no business on the whole earth so ennobling, so refreshing, and so pleasant.

THE FRUIT INDUSTRY.

Let us glance a moment at the fruit industry when there is a scarcity of rain. On general principles, we can produce a good fruit crop when we have a dry season. A scarcity of rain, on the other hand, if we are depend-

ing on grain, and there is a crop failure, we suffer a loss; but if we are depending on fruit for a livelihood, we are not so anxious as to whether it rains or not. Let me ask this question: Is there any enterprise in California, or in any other country, that offers such certain paying profits as the fruit industry? Just notice it for a moment; notice the different possibilities there are in this great industry—green fruits, dried fruits, canned fruits, crystallized fruits, jams, jellies, marmalades, candied fruits. There is no industry to compare with it. It is a grand business to those engaged in it. The influence it exerts is salutary; it ennobles, refines, and makes people better.

What is there to discourage any one who wishes to engage in the fruit industry in California? Are there not fifty million people on the other side to use our fruit? Is it not a fact beyond a doubt that there are millions of fruit trees killed by the severe winters in the East, and horticulturists are discouraged there? In the first place, the orchardists have to wait eight or ten years for their trees to come into bearing, then to have them winter killed. And suppose they replant; it is only a question of a few years, and they are again exposed to one of those severe winters, and most of the trees are again killed. I met a gentleman a short time ago from Ohio. He referred to a peach orchard which he had, and he remarked that the winter of 1884–85 killed the entire orchard. Can peaches, pears, plums, prunes, and apricots be produced in paying quantities there? No; not at all. There are some apples in all States, but in many places they do not succeed well. Take Champlain County, Illinois, which a few years ago sent out of the county fifty thousand barrels. At present they send elsewhere for apples for home consumption.

THE PROFITS.

I will refer to one hundred and fifty pear trees of A. F. Kercheval, of Los Angeles, planted in 1880. He sold from those trees, according to his books, in 1881 $35 worth of fruit, in 1882 $100 worth, in 1883 $240 worth, in 1884 $300, and in 1885 $445. These trees have not made a large growth, and some of them have been damaged by gophers. This is not a large yield, but a fair one. Some of those trees yielded $7 and $8 worth each this year. The last four years they have averaged $271 for those one hundred and fifty trees, on one and one half acres of land. These are facts which Mr. Kercheval will verify.

Let us look at the demand there would be for our grapes if the price in the East were fixed at 6 cents per pound. The producer can afford to raise grapes at $25 per ton, which is $1\frac{1}{4}$ cents a pound, $1\frac{1}{2}$ cents for freight, $1\frac{3}{4}$ cents for the retailer, which is $4\frac{1}{2}$ cents, with $1\frac{1}{2}$ cents margin for contingencies. Then just think that the grapes we are shipping are superior to any grape grown anywhere. In fact, grapes that we produce in such abundance cannot be produced in the East, except under glass.

I would like to refer to the vast quantities of fruit that will be put in cold storage in the East and sold from December to June. There are more than one hundred cities that will have a cold storage in the near future, and these cities will use from one hundred to one thousand tons of fruit, and if these cities use on an average two hundred tons from December until June, that would amount to forty million pounds, equal to two thousand carloads of fruit. There are six cities in California that will ultimately have cold storage and will take some of our surplus fruit. It is only a question of time till the cold storage will come into general use. Then we will appreciate having ripe fruit from December to June, the same as in July, August, and September.

California is sending apples to Australia, China, Japan, and other places, also canned fruit to the East, Great Britain, and Europe, also to other foreign countries. For some of our canned fruits, as well as dried, we have the world for a market. Only a few years ago Woodhead & Gay had a few barrels of foreign grapes sent to Los Angeles. These grapes were put up in ground cork, and were sold at 30 to 50 cents per pound in January and February. Now we raise better grapes, and instead of sending to Europe for grapes for winter use, we will supply that demand in the United States, as well as other places. It is hard to say what new processes there will be to utilize our fruit. From June, 1884, to June, 1885, there were about $20,000,000 paid for imported fruits that California can produce and will produce in time. California canneries this last year turned out about one million cans of goods; and, as I have already said, two thousand five hundred carloads of fruit were sent East. Is this not a good showing? There were imported into the United States in 1884, seven million nine hundred and forty-five thousand nine hundred and seventy-seven pounds of figs, fifty-seven million pounds of French prunes, four million seven hundred and thirty-two thousand two hundred and sixty-nine pounds of almonds, fifty-three million seven hundred and two thousand two hundred and twenty pounds of raisins; oranges and lemons, eighteen thousand six hundred and twenty-six carloads; preserved fruits, two hundred and forty-four carloads; olive oil, two hundred and forty-four carloads; and other fruits, six hundred and thirty-six carloads. If we could produce this fruit it would take two fruit trains each day in the year, Sundays excepted, with forty-two cars to each train, to take this amount East. Now, there is no question but what California can produce these fruits. Let me say, in conclusion, that the fruit industry of California is not even in its infancy. Within the next ten or twenty years this industry will assume proportions that will astonish the most sanguine. The orchardist will be more than rewarded, and the railroad companies will be taxed to their utmost capacity to convey the vast quantities of fruit East.

People that are engaged in or expect to embark in the fruit industry should not expect such large returns. If horticulturists can make $100 per acre net profits, they should be satisfied. Let us contrast the profits of farmers with fruit growers. If the farmer raises two thousand pounds of wheat or barley and secures 1½ cents per pound, he is doing well, and goes home with his $30, and out of it he has $20 net profit; but the fact is, the farmer does not get that average at all, considering the failures and partial failures he has. If the orchardist has an orchard of one hundred trees per acre, after they are eight years old he may reasonably expect two hundred pounds to the tree, which would make twenty thousand pounds. At ¾ cent a pound he would realize $150 an acre. This is a low estimate. The products of the orchard are almost a sure crop, especially if the orchard is composed of four or five kinds, say apples, pears, plums, peaches, and apricots.

WHEAT VS FRUIT.

Essay by General N. P. Chipman, Red Bluff.

WHEAT GROWING IN CALIFORNIA.

I have been requested to submit some observations upon the issue of wheat vs. fruit.

In the sense that wheat growing and fruit growing are antagonistic, and that one or the other must cease in this State, I must decline to discuss the question. There can be no antagonism, and should be none between these great industries. Both are important, and both must continue. In the evolution of California, her second stage was the wheat era, during which, in one year at least, 1880, she stood foremost among the States of the Union, producing fifty-five million bushels; thus showing the marvelous resources of our soil, and our ability to lead in whatever we find adapted to both soil and climate.

The question I shall discuss is, whether we should continue wheat growing as our chief agricultural industry, or whether we should encourage and develop our fruit industry to the curtailment of our wheat area and wheat output.

Our soil is the prime source of our wealth, and should be so utilized as to yield its highest and best results.

Observation teaches and statistics show that constant and successive croppings of wheat impoverish the soil and diminish the average yield in direct ratio with the persistency and close succession of the croppings. This is shown in the comparatively recent virgin soils of Dakota and other western wheat regions.

President Stickney, of the Chicago, St. Paul, and Kansas City Railroad, recently stated at a meeting of the Chamber of Commerce of St. Paul, that the average wheat crop in northern Minnesota and Dakota had fallen to twelve bushels an acre, and was growing less every year. I quote from his reported speech: "Where the farmers of northern Minnesota produced twenty and twenty-five bushels a few years ago, they now only grow twelve. The expense of raising wheat is $8 per acre. When the yield falls much below twelve bushels the farmer will not receive his $1 for $1. I think it is time to sound the alarm to our farmers. The history of farming in Minnesota gives this: The first year's crop is good, and will perhaps pay for the farm. The second year is better, and the machinery is paid for. The third year is not so good, but buildings are erected. From that time the crops are poorer, and the farmer begins to run behind, and finally he mortgages and loses it. If he had only stopped at the end of the fourth year and changed his plans of farming, he would have been saved."

He then warns the merchants of the danger, and says: "Tell the farmers to change from wheat growing to something else. Drum it into them. We must force them to abandon their policy of wheat growing alone."

How long do you suppose a Minnesota farmer would go on raising wheat under such depressing conditions if he could plant raisins, grapes, and figs, and olives, and oranges, and apricots, and all our fruits and nuts? But I must not anticipate the case of the defendant.

Within one half mile from where we now are is a two hundred acre field, being a part of the noble Rancho Chico. This field has been cropped to wheat for over thirty years. The land is of the richest and finest quality. General Bidwell has assured me that in early days it produced seventy bushels to the acre. The yield now rarely exceeds twenty-five.

Addressing gentlemen familiar with the law governing successive croppings of the soil to one kind of grain, I need spend no further time on this proposition.

In this State we mitigate somewhat the operation of this law by our system of summer fallowing, but this only prolongs the fertility of the soil; it does not restore it. The rapid exhaustion is somewhat arrested, but exhaustion goes on in less ratio.

So intelligent a wheat grower as Judge O. C. Pratt, I am told, claims that land not far south of Chico, grown to wheat on the summer fallow principle, shows no falling off in yield. I cannot dispute his observations. It may be that the occasional overflow from the Sacramento River and Butte Creek gives back to the soil the fertilizing properties exhausted by the process of wheat growth, as I think is the fact as to other lands around Durham and Biggs, of which the same claim is made of constant and undiminished fertility.

Of one thing, however, we may feel assured, that an inflexible law of nature is not to be ignored. The soil cannot be made to give up its properties without exhaustion, unless we return in some form an equivalent.

The census of 1880 showed that California had one million eight hundred and thirty-two thousand four hundred and twenty-nine acres in wheat, yielding twenty-nine million seventeen thousand seven hundred and seven bushels—an average of fifteen and eighty-three one hundredths bushels per acre.

The Agricultural Department at Washington reported February, 1888, that in 1887 California had two million seven hundred and sixty-six thousand two hundred and thirty-five acres in wheat, yielding thirty million four hundred and twenty-nine thousand bushels—an average of a trifle over eleven bushels per acre. The average per acre in 1886 was eleven and one third. This shows a falling off in the average of four and one half bushels per acre, or a little over 28 per cent in eighteen years. It is a rather significant fact that our average has fallen off much more than the average for the whole United States.

The annual average for the United States from 1870 to 1880 was twelve and four tenths bushels, and from 1880 to 1887 twelve and one tenth bushels, being a falling off of only about three tenths of a bushel. This, I think, must be due to the greater proportion of new wheat lands being opened up elsewhere than in California, and to the fact that crops are changed to other cereals in other wheat States.

The conclusion, therefore, seems inevitable, that constant wheat cropping in California of the same lands is gradually reducing fertility and should cease, except in favored regions, and should be intermitted by planting of other crops in all cases, or the land reinforced by artificial fertilization.

Following in line with impoverishment of the soil comes falling off in average price paid for wheat.

The Agricultural Department at Washington in report of 1888 gives a table of twelve wheat States, not including California, which shows the average price of wheat from 1875 to 1887 to have gone from $1 per bushel to 68 cents, farm value.

This farm value varies more than would be supposed. In Kentucky in 1875 it was $1 05; same year in Nebraska, 64 cents; in Michigan it was $1 15; in Iowa, 71 cents.

The average export value for twelve years is given, showing that it fell from $1 12 in 1875, to 89 cents in 1887.

Mr. McCarty in his valuable "Statistician" gives a table showing average value per bushel in the United States; average yield per acre, and average value per acre from 1862 to 1887. In 1866 the price reached $2 19½ per bushel, and in 1884 as low as 64½ cents per bushel; and the lowest yield, in 1881, giving ten and two tenths bushels per acre. The highest value per acre was $23 in 1867, and the lowest $8 05 in 1885. The average in 1887 was as follows: Value per bushel, 68.1 cents; yield per acre, twelve and one tenth bushels; value per acre, $8 25.

The average value per acre of California's wheat crop of 1887 was $7 40. This was a very bad year, but in 1886 the average value per acre of our wheat crop was only $7 30, as shown by the same authority. Both these years prices were low; but the question for the wheat grower to consider is, can better results be expected in the future, when we know that the average yield per acre is falling off, and the price has been on the decline for some years? It is certain that the wheat growers of California, as a class, have lost money in late years. Individual instances and exceptional lands may be pointed out where profits are made, but any one familiar with the struggles of the mass of wheat farmers in this State knows that matters with them have been going from bad to worse.

I tried an important case four years ago, where it became necessary to show the cash rental value per acre per annum of the best Sacramento River bottom lands in Tehama County, and they are as good as can be found for wheat raising. Such witnesses as John Finnell, J. S. Cone, Hugh Mooney, and Herbert Kraft were called. Two of these are among the largest and most successful wheat growers in the State. The result of the testimony showed that $3 per acre per annum was all a renter could afford to pay. This yields only 10 per cent interest on $30 per acre for land that at the time was assessed at $50 per acre, and is now selling at $100 per acre. The tax on the land was $1 per acre, leaving but $2 to the owner. This is only 2 per cent per annum on the market value of the land.

It is due to wheat growers and to the State to say, however, that our average yield is less because many lands have been cultivated to wheat that are not adapted to it, and that the average value per acre is reduced for the same cause. That many men are making money raising wheat I know to be true. I am only seeking to point out the actual condition of the industry generally, and to suggest better and higher uses for much of our lands now devoted to wheat.

There is another important factor for the California wheat grower to consider—the market for his surplus; and this also involves the question of the competition he must meet in seeking the markets of the world.

For our surplus the home market outside of California is shut off by the great mountain ranges, and the long line of rail transportation to States of the Union having a deficiency.

The market for our surplus wheat is Liverpool. California farmers will ever be subjected to the changing conditions in Europe, and to the fluctuations in the cost of transportation by sea. This last element is a menacing one. A table of rates from 1878 to 1888 shows a fluctuation ranging from 85 shillings ($21 25) per long ton in 1881, to 25 shillings ($4 25) per ton in 1887. No one can foresee or provide against this factor; and it comes to this, that the price of California's surplus is fixed in Liverpool, and the price in Liverpool is fixed in part by the shipowners, and the shipowners are governed in part by the demand on this coast for freights brought hither from abroad. The table of shipping rates for the period named is itself the

best commentary that can be made upon the uncertainty that must always attend the fixing a value upon our wheat. The table is as follows, and is for April first of each year: 1878, 50 shillings; 1879, 45 shillings; 1880, 45 shillings; 1881, 85 shillings; 1882, 65 shillings; 1883, 35 shillings; 1884, 35 shillings; 1885, 36.3 shillings; 1886, 32.6 shillings; 1887, 22.6 shillings; 1888, 25 shillings.

Our isolated situation adds still more to the difficulty, because Liverpool fixes the price of our home market. Mr. Starr, at Port Costa, pays about the price in Liverpool, less freight to Liverpool, plus cost of carriage from the interior. General Bidwell, at Chico, pays the Liverpool price, less cost of carriage to Port Costa, and thence to Liverpool. And so we in California are raising wheat in direct competition with all the world. This is not so in the great country east of the Rocky Mountains. The home consumption is enormous. The great manufacturing centers in the East are large buyers, and never ship from East to West.

The change from East to West of wheat production is an interesting fact in agriculture, and deserves passing mention.

In 1849 the Atlantic Coast produced 51.4 per cent of all our wheat. The central belt, 43.3 per cent, and the trans-Mississippi only 5.3 per cent. Gradually this changed so that in 1884 the order stood thus: Atlantic Coast, 12.2 per cent; the central belt, 36.1 per cent; and the trans-Mississippi, 51.7 per cent. The great West went from 5 per cent to 51 per cent, and the Atlantic Coast, from 51 per cent down to 12.

The increase in absolute quantities on the Atlantic Coast was slight, but west of the Mississippi it went from five million two hundred and eighty-eight thousand nine hundred and eight bushels in 1849 to two hundred and sixty-four million nine hundred and twenty-six thousand bushels in 1884.

Whence comes our competition? It comes from the wheat growers in our own country and from foreign lands.

Steamer rates from New York City to Liverpool, per ton, are	$1 80
Water rates from Chicago to New York, per ton, are	1 82
From Chicago to Liverpool	$3 62
The average rate from San Francisco to Liverpool for the past eleven years is, per ton, 43 shillings, equal to	$10 75
To this add interior freights, averaging, probably on the whole crop shipped, per ton	2 50
Total, California to Liverpool	$13 25

This shows that we start in the race for Liverpool with our eastern farmer at a great disadvantage—nearly 30 cents a bushel. Our present rates of freight are not much over half the average for eleven years, but even this makes the cost to us more than double the cost from Chicago.

Another competitor on this continent I think will be the provinces of Canada, along the line of her great continental railroad. I am informed that an immense area of wheat land, equal in productiveness to our Dakota lands, lies along that road. British enterprise and British determination to be independent of the world for food products, will soon be directed towards that region.

British India already is a large factor in wheat competition, although not yet so formidable as has been feared. It seems to me, however, that a people who work for a few cents a day, who plow with a stick, who thrash with a flail, and market dirt and seeds of weeds with the grain, and themselves live on rice and millet, and scarcely know the taste of wheat, and outnumber us four times, who can increase their exports from two hundred and sixty-

nine thousand eight hundred and fifty-eight bushels in 1872 to twenty million two hundred and ninety-two thousand one hundred bushels in 1885, are not to be despised. How long it may take to overcome the prejudices of centuries that cling to these people is hard to say; but when improved implements and methods are introduced and adopted, how long will it take British India to supply the deficiency in Great Britain? Six times her export of 1885 would fully supply Great Britain on the basis of her average purchases for the past fifteen years.

In the Argentine Republic of South America we have another and a formidable prospective competitor. She has an immense area of land suitable for wheat culture. European immigration is rapidly changing pastoral lands into arable culture. In 1887 it was estimated that in three years the increase of cereal crops was 23 per cent, of which twenty million bushels were wheat, half of which was available for transportation. Should immigration continue wheat culture will be rapidly extended. In the opinion of our Commissioner of Agriculture Great Britain can more easily supply her wants from this source than from India.

Many of you will remember the remarkable essay of Prince Krapotkin in the "Nineteenth Century," upon the future food supply of Great Britain. I cannot stop to quote him, but he showed that the United Kingdom might have food to export and feed thirty-seven million people if her present area were cultivated as land is on the average in Belgium. And so it would seem that Great Britain has it in her power to supply herself within the borders of the United Kingdom alone.

I need not extend the list of competitors. They are Russia, Australasia, Africa, and some other countries.

This question of markets of the world, about which the people have recently heard a great deal, is a serious one to the producer in the United States. Good and bad crops or increase or decrease of area seems not to figure very much. It often happens that the price has been high when the crop was large, and often the reverse, and sometimes short crops and low prices go together, as we know to our sorrow in California. The supply of the world regulates the price, and our crop figures only towards the aggregate. The United States produce more than one fifth of the wheat of the world. The country has furnished in grain and flour from 1872 to 1884 51.1 per cent of the world's deficiency. Russia averaged 13.6 per cent, and India 7.9 per cent.

California exports about 70 per cent of her crop, or about twenty-five million bushels, and this is about one fifth of all the wheat exported from the United States in years of largest demand.

We produce about one twelfth of the wheat of the United States, so that our excess of exports over other portions of the Union is very great. This is the disadvantage we labor under in being deprived of a home market.

Improved methods of harvesting have cheapened wheat growing to large growers (the combined harvester has done much), but they are not available to the small farmer. But however cheaply we may grow wheat, of what will it avail after we have lost our market?

But I must leave the case of the plaintiff. Let us sum up our conclusions:

First—It seems to me that wheat growing in California for the markets of the world is at least precarious.

Second—Average production to the acre is diminishing.

Third—Fertility of the soil is diminishing.

Fourth—We are at a disadvantage with our competitors by reason of their cheaper and better facilities for transportation.

Fifth—There is a strong probability that wheat areas in India and South America and in the Canadian provinces will be greatly extended, and the demand upon the United States will gradually decrease and finally cease.

Sixth—California must decrease her wheat area, and increase her population, and thus increase the home market. The law governing surplus manufactures must be applied to agricultural products. The home market that has placed us first among the nations of the globe in manufactures must be brought to bear in agriculture. We must not be obliged to haul our products half way around the globe, past the doors of our most formidable competitors, in order to find a market. Of all the agricultural products of the United States, including cotton and tobacco, only 10 per cent are marketed abroad. Excluding cotton and tobacco, only 5 per cent, and yet we in California must go abroad in search of a market for 70 per cent of all our wheat. If we controlled the world's market in wheat, as the South does in cotton, this disproportion would be to our advantage, but unhappily this is not true, and in my belief the situation will not improve. I am prepared to see Great Britian supplied from other sources within the next ten years.

Seventh—Lands no longer profitable for wheat growing should be turned over to grasses and forage plants, or should be planted to fruits.

FRUIT GROWING IN CALIFORNIA.

I turn now to the case of the defendant.

In what way will our fruit industries mend matters? Shall we grow more fruit and less wheat? What are our advantages over other States of the Union, and what are these advantages intrinsically? I approach the discussion without misgivings and with great confidence.

The one thing above all others that gives preëminence to California as a fruit-growing State is its climate, the economic value of which is only just beginning to be realized.

There is a difference of only eight or ten degrees between the mean annual temperature of the coldest regions of Dakota and Minnesota, and San Francisco, yet in Minnesota and Dakota wheat flourishes with a minimum temperature of 60 or 70 degrees lower than we ever see it. It is the minimum and maximum that must control. Let us cease talking about mean annual temperature. The mean in San Francisco is 55 degrees; the same as Washington City, where I have seen weeks of continuous zero weather. The mean of New York City is 54 degrees, only one degree lower than in San Francisco, and yet strong men froze to death there in the streets last winter, and snow completely stopped the arteries of commerce for nearly a week.

In this hall I see ripe oranges from Tehama County, grown in sight of the everlasting snows of Mount Shasta. The phenomenal cold of last winter registering as low as 19 degrees above zero at the United States Signal Station at Red Bluff, did not destroy our orange trees, for they send here their defiance of the elements in the shape of ripe fruit from the same branches that were covered with ice and snow for a short time last January. It must not be forgotton that when we had 19 degrees above zero, a low temperature seldom reached, Dakota, Minnesota, and other Western and Northwestern States registered 40, and even 60 degrees below zero. Domestic animals froze to death in their tracks. Children perished on their way from school. Strong men died in the effort to reach their barns, and in sight of their homes. Forest trees as well as fruit trees were burned to death as by fire in this awful weather. It is not possible to overestimate

the value of a country like ours to the fruit grower, in comparison with the frozen regions in the States east of the Rocky Mountains.

If the property of General Bidwell, with its climate, soil, capabilities, and surroundings, its orchards, flowers, and fruits, could be set down within one hundred and fifty miles of Chicago, it would sell for as much as the entire taxable value of Butte County. It is not the richness of the soil that would make this true, for equally rich soil is to be found in the State of Illinois, but it is the climate and its possibilities.

What would Riverside as we know it, or Vaca Valley as it is, be worth if situated in New York State? And may we not seek to realize the true value of our great advantages by this comparison.

When I read last winter, how that athlete and intellectual giant Roscoe Conkling, fought for his life and lost it in a struggle to reach the Fifth Avenue Hotel across Union Square; when I read the pathetic story of that heroic school mistress who toiled through the deadly western blizzard in a vain endeavor to save the children committed to her charge, it seemed to me that the transcontinental railroads would not be able to transport the people who would fly to this land of sunshine and plenty; and I still believe that our climate, which alone makes our State proudly distinctive among the States of the Union, will bring us the population of the East and the Great West as rapidly as we can prepare for them, and as soon as they can dispose of their property there.

But the question recurs: Is fruit growing profitable? Can we afford to surrender some, not all, of our wheat lands to its culture? As yet we have not that kind and amount of data to enable us, from observations through a period of years, to deduce results entirely satisfactory. Fruit growing in California is but in its infancy. Some facts, however, and important ones, are established.

The era of fruit growing has greatly enhanced values of land; and this enhancement is being steadily maintained and augmented. Many a wheat mortgage has been lifted by the fruit grower. In the absence of general statistics showing the results or profits of fruit growing in this State, we can only look to typical regions where these are now well known. Take Vaca Valley as a type of the northern portion of the State: Prior to 1874 that valley was devoted to wheat growing. It cut no figure in trade, and the owners of land were making but little money, comparatively, and the lands had no value except for wheat growing, and the price was low. Fruit planting began about that time, and now nearly the entire valley is in trees—about four thousand five hundred acres. Mr. W. W. Smith has an orchard of two hundred acres there, which I am informed yields a net income of from $100 to $200 an acre annually. In 1874 this land was valued at $12,000. It is now worth $600 an acre, and I do not suppose could be bought for that; indeed, Mr. Smith was offered $1,000 per acre for one hundred acres recently. A recent purchase of nine hundred acres, lying just outside this valley, was made for $100,000. Subsequently, at an auction sale, one half sold for nearly enough to pay for the whole. I have been reliably informed that there was paid to fruit growers last year in this valley, through the Vacaville Bank, $900,000; and this is $200 per acre for all the fruit lands of the valley by the way of income. These are all non-irrigated orchards, and fruit growing there is certainly in a most healthy and prosperous condition. Similar conditions of success and prosperity exist in the Santa Clara Valley, around Woodland, Sacramento, Marysville, Newcastle, and a score more of places.

Fresno County furnishes an illustration of the revolution worked by fruit growing. Here irrigation is essential. I think the change from wheat to

fruit in Fresno County does not date back of 1880, and yet her raisins are known and eaten by all men. Lands formerly selling from $5 to $10 per acre, now sell into the hundreds, and pay good interest on the investments. It is situated in the central region or Southern San Joaquin Valley.

Riverside furnishes an example of the magical change wrought by water and fruit culture. Lands here classed as desert and practically valueless three years ago, pay interest at $500 to $1,000 per acre. This is Southern California.

Another type is found around Newcastle, in the foothill region of Placer County.

The development here is marvelous and gives great hope of all the foothill lands, of which there are millions of unoccupied acres in this State purchasable at low prices.

Lands around Newcastle selling five years ago at $5 to $10 per acre, now bring $100 and over per acre. The elevation is from five hundred to one thousand feet above sea level. Olives, figs, oranges, and all deciduous fruits flourish here. Planters are prosperous and making money. Irrigation is practiced although not always necessary.

These are communities of intelligent and capable growers who know the art of growing and marketing fruit.

This enhancement of value is felt throughout the entire State, as is shown beyond dispute by the enormous increase of the taxable value of lands lying within the fruit belt.

I find great difficulty in dealing with the question of the profitableness of fruit growing in California, for lack of general statistics. I can give well authenticated instances of fruit growing on a large and small scale in all parts of the State, showing very large profits on the investment at the very high prices of land, or cost of an orchard brought to the bearing point. I hesitate to do this, however, because no one should generalize from such insufficient data. I think, however, it is within the observation of every intelligent fruit grower in this State that, where the business is pursued with that intelligence which its nature and character demand, no more lucrative or profitable business can be engaged in by tillers of the soil.

Intelligent fruit growing implies a knowledge of soil, climatic influences, varieties to plant, the art of culture and handling, and business tact to market the product.

Aside from any particular illustration showing the profitableness of fruit growing, we have, what to my mind is an exceedingly strong argument in that direction, viz.: In all the valley counties, from Shasta to San Diego, men of business shrewdness and intelligent observation, who have been long residents of the State, and have observed our fruit development, are buying lands for fruit growing, and paying prices far beyond any price that would yield an income in wheat growing or for any other purpose than for fruit.

Probably the best single illustration covering the widest territory, and the greatest variety of fruit, is shown in the result of the work of the California Fruit Union for the year 1887. I take this from the "California Fruit Grower," of November 10, 1888:

Boxes shipped	328,296
Crates shipped	169,268
Net weight of fruit, not including weight of package (pounds)	11,363,020

Gross receipts		$675,864 40
Freight paid	$283,033 80	
Cartage paid	6,002 35	
Commissions paid	67,254 40	
Gross charges		356,289 55
Total net returns		$319,574 85

This shows the net average per pound realized to the grower in this State to be 2.8 cents. If we knew precisely what to deduct as the cost of production, boxing, and delivering to the Union, we would know what this green fruit yielded per pound as net profit to the grower. In 1886 the net profit to the grower through the Union, was 2.41 cents per pound, and for 1887 it is estimated at about 2.25 cents per pound net to the grower. By strong support of this Union, and by gradual increase of shipments, the cost of sale will be reduced materially, which will add to net result.

Trees in full bearing will average one hundred and fifty pounds each, or fifteen thousand to the acre. This fruit at Union rates for 1887 would yield net $420 per acre. Pruning, cultivating, thinning, picking, boxing, and delivering to the Union, I cannot figure beyond $120 per acre, leaving balance net over all to grower $300.

As an orchardist myself, looking forward to the time when my investment will yield me a steady and fair income, I promise myself, as I promise others, that $100 per acre as a net return is good enough, and can, in my opinion, be safely relied upon, always presupposing the best and most intelligeut cultivation, handling, and marketing.

The constancy of our fruit crop, and the early yield, and the early fruitage of new orchards, and the long life of our trees, are all well understood, and are advantages which we enjoy over any other region of the United States. That we can raise fruit in large quantities, and of exceptional quality, no longer admits of a doubt. The kinds of fruit we grow greatly strengthens our case. In no State of this Union, and in no country in all Europe or elsewhere, of which I have any knowledge, is so great a range of fruit produced as in California. Oranges, olives, lemons, limes, plums, prunes, figs, grapes, and nuts of all kinds, apricots, peaches, nectarines, pears, cherries, apples, all the small fruits; indeed every fruit known to commerce, save only a few exclusively tropical fruits, not much known to us, are here produced. All varieties of all zones seem to flourish here, regardless of characteristics in their native habitat. These are prodigious advantages; they are beyond computation in money value; they come of our climate, our ocean and mountain influences, and our soil.

Our best wheat lands produce from one half to two thirds of a ton of marketable wheat per acre. In fruit, these same lands will produce from five to fifteen tons of green fruit to the acre. Looking towards the market for wheat and fruit as it now exists, I believe that fruit will yield more net profit per pound to the grower than wheat.

There being no longer any dispute about our raising almost all known fruits of the earth in large quantities, the great question, as in wheat growing, is the market.

Here, as in other departments of investigation on this subject, we lack data. This country imported in the year 1886–7 of fruits and nuts $20,608,480. I am not able to inform you whence all these fruits came, or what kinds of fruits they were. It may be stated generally, however, that they were chiefly the fruits and nuts grown in our California orchards. We have then this field for operations. As showing increased consumption the imports of fruits for 1887 exceeded imports for 1886 by over $3,000,000.

A tentative estimate of the Commissioner of Agriculture, report 1888, of the products of agriculture, 1886, gives the farm value of the fruits of the United States to be $175,000,000.

This is equal to one half of the dairy products of the country; is more than half our wheat crop; more than one fourth of the corn crop; is more than double the oat crop; is more than double the wool crop; is about equal to the wool, hemp, flax, tobacco, hops, sugar, syrup, honey, grass seeds, and wines combined, and is nearly the value of all the vegetables grown.

We export only about $1,000,000 in value. The consumption of fruit is about $3 per annum per capita on our Commissioner's estimate of production.

If we could double the present consumption of fruit in this country it would give California an income beyond what we now have of over $150,000,000, allowing the East and Oregon to take the balance, and it seems not an extravagant hope that this increase will be attained.

Our population is growing at the rate of nearly or quite three fourths of a million people annually. Demand for the fruits of the earth goes on with increased number of mouths to feed.

Notwithstanding the importance of fruit culture to this country, there has been no organized effort to aid it through our Agricultural Department at Washington, until 1886. Mr. H. E. VanDeman in his second annual report to the Commissioner of Agriculture (report 1888) says: "The year 1887 may really be said to be the first in which I have had an opportunity to get the machinery of this division (Division of Pomology) in good working order."

This great government, with more money than it knew what to do with, started this division with an appropriation of $3,000 in 1886–7, and repeated this munificent provision for 1887–8.

One man was detailed in 1886 to serve the cause of practical and scientific pomology for the United States. In 1887 the force consisted of a clerk, and an artist occasionally, to make the few drawings found in the report, and with this paltry $3,000 all the expenses of the division are borne, including the salaries of the clerk and artist. Mr. VanDeman speaks of several valuable papers that have been prepared, gratuitously, I suppose, all of which await appropriations before they can be given to the world. It is to be hoped that these valuable papers, and the matter they contain, will not have fallen into innocuous desuetude before Congress awakens to their importance.

I want to digress a moment to record in the most public manner my utter disrespect for the statesmanship that has been one hundred years in realizing that agriculture was of sufficient importance to entitle it to a Department of Government. In 1880 our census showed our agricultural products to be of the value of $3,020,000,000; nearly $500,000,000 more than Russia produced with her one hundred million population; nearly $800,000,000 more than imperial Germany, and more than Austria, Italy, Spain, Australia, and Canada combined.

To-day our agricultural products amount to two thirds of all the products of the United States. They have made our nation great and powerful and independent. There is no food product, except possibly rice and sugar, of which we do not produce a surplus, and of these there need be no deficiency.

No victory of peace or of war in all history is comparable to this. A hundred years ago agriculture stood stationary where it had stood for a thousand years before. The farmers of America have rescued agriculture and given to the soil a new value; they have simplified the problem of

government by bringing abundance where poverty and want taxed the resources of statesmanship.

In all these years the American farmer has gone on unaided save by the inspiration of his love of home and country and made this nation great and powerful.

France, with one twelfth our area and not much over half our population, appropriates $20,000,000 annually to foster agriculture. Brazil, with thirteen million population, appropriates $12,000,000 for this purpose annually. The United States, with a larger area and ten millions more population than both these countries, appropriates less than half a million dollars in aid of agriculture.

Let us hope that the new Department of Agriculture will be liberally supported and wisely administered, and that the Division of Pomology will not be overlooked.

To illustrate the increased consumption of fruits, and this bears directly on the question of market, I give a table showing imports for three decades of oranges and lemons:

1856–57	447,136 boxes of oranges	238,297 boxes of lemons.
1866–67	692,259 boxes of oranges	337,441 boxes of lemons.
1876–77	893,820 boxes of oranges	612,463 boxes of lemons.
1886–87	1,741,644 boxes of oranges	2,281,087 boxes of lemons.

Imports of oranges have doubled in ten years, notwithstanding the large shipments going forward each year from California and from Florida.

We imported for the year 1886–87, forty million six hundred and sixty thousand six hundred and three pounds of raisins—over two million twenty-pound boxes, and we produced last year and sold about eight hundred thousand boxes. There is no reason why we should not have the entire raisin trade of this country, and push our goods into foreign lands. Already four thousand boxes have gone to London on an order for this year's crop.

We imported same year eight million seven hundred and fifty-two thousand eight hundred and ninety-eight pounds of figs. No doubt is entertained by any one that fig growing in California is very remunerative. Prices are quoted at 5½ to 10 cents. At 6 cents a pound the figs imported would show a value of $525,173.

From the single port of Bordeaux we imported of prunes in 1886 of value of $840,299 19 as shown by report of our Consulate.

We excel in our prunes, and eventually we must have the market. I have no means of knowing our production but it is quite large and is increasing.

I have spoken of the faith in fruit shown by the investments in lands at high prices, and the extensive planting going on by our most intelligent and sagacious people all over the State. Let me further emphasize this point by showing comparative results:

In 1871 there were less than two million pounds of green fruit shipped overland; in 1887 we shipped forty-nine million seven hundred and twenty-nine thousand eight hundred pounds.

Of canned fruits we shipped, in 1872, one hundred and eighty-two thousand pounds; in 1887 we shipped forty-five million one hundred and twenty thousand nine hundred pounds.

Of dried fruits we shipped, in 1875, a little over five hundred thousand pounds; and in 1887, thirteen million five hundred and seventy-seven thousand one hundred pounds.

Of raisins we shipped, in 1874, only two hundred and twenty pounds; in 1885, we shipped six million two hundred thousand pounds, and much more in later years. Our pack this year is estimated at nine hundred thousand boxes or eighteen million pounds.

Notwithstanding this rapid increase and this very large shipment of green fruits, we have as yet scarcely given the mass of the people living east of the Rocky Mountains a taste of our fruits.

In a very interesting and deeply instructive report recently made by Mr. W. H. Mills to the State Board of Trade, showing the result of the Grand Army exhibition at Columbus, Ohio, this summer, some significant facts are given, bearing directly upon the question of market.

I quote: "Parties from southern Nebraska assured me that no California fruit had ever been offered in their vicinity, notwithstanding they are residing upon lines of railroads. Parties in Kansas gave the same assurances; the same testimony came from Illinois, Indiana, Ohio, Pennsylvania, and Michigan." Mr. Mills then points out how our fruit is massed in Chicago, and sold out at prices making it a luxury and depriving it of all value as food, and suggests a remedy. He continues: "In this way the fruits in their various seasons could be distributed to a population of from twenty million to thirty-five million people. We can place all kinds of fruits in eastern markets from two to three months earlier than they ripen in any part of the country north of Tennessee, North Carolina, and Arkansas. In this general region there are over forty million of people, a very large proportion of whom would become consumers could the fruit be furnished to them at anything like an economic rate." He says he found grapes selling in Chicago at $200 per ton at retail, thus depriving people in the middle and lower circumstances of life the privilege of even tasting them, and yet the freight charged against the grapes in that market is only $50 per ton.

If Mr. Mills' observations are sound, and they are corroborated by the highest evidence, this market is very large. It is difficult to give an adequate idea of its extent. Large as our shipments seem now, if each day we could reach the eastern people our present yearly shipment would hardly supply the daily demand for green fruits.

When we come to our prepared fruits—dried, canned, preserved, and crystallized—and our nuts, and our olive oil, and other prepared products, we have the world's markets. Our raisins and prunes have already pushed their way abroad, and our canned goods Mr. Lubin has described as obtainable in Crosse & Blackwell's great fruit house in London.

I have the greatest confidence in our superior ability to improve upon methods, ultimately conducting us in California to the front rank in fruit growing, as it has in almost every branch of agriculture and manufacture in the United States.

There will come a day when people who can have clean fruit, will cease buying imported prunes that are handled by dirty peasants and finally trampled into barrels and kegs with the bare feet; and so with currants.

There are some considerations as to our eastern market not readily assented to, and yet are beyond dispute. As a general fruit-growing country, the great west and northwest region, indeed the Middle and New England States, are failures. The history of tree planting is the history of discouragement and disaster.

I am a member of the American Horticultural Society, formerly called Mississippi Valley Horticultural Society, and have read the four volumes of their proceedings with some care. Let me quote a specimen of troubles presented and remedies suggested.

Mr. J. S. Beatty of Kentucky, in volume 2, page 219, reviews the peach interests in the central States of the Mississippi Valley. I quote: "The Mississippi Valley is more exposed to meteorological extremes and disturbances than any other part of this continent. The torrid heat of our summers and the arctic blizzards of our winters embrace a range of temperature from about 120 degrees in the shade to 40 degrees below zero. We are exposed to droughts and floods of great extremes." He gives a vivid description of the dread cyclone, and asks: "What is it that will hold out against these mighty forces? The trees cannot long endure the compound forces of old Sol, nor can the fruit germs resist the intense cold of 40 degrees below zero, or 20, or even 10 degrees, under certain conditions." He then describes the effect of protracted droughts, and says the fruit "wilts as passed through an evaporator." He proceeds to point out numerous other causes of failure. He concludes by asking five pertinent questions. I quote the fifth—says the writer: "Is there any practical way of protecting our peach trees by baling or thatching, to prevent winter killing of both trees and fruit? Also, could not late spring frosts be rendered harmless to peaches by means of a cheap iron furnace to burn coal in, set between every four trees, and fired up at any time that frosts may be expected."

Imagine Mr. A. T. Hatch, of Suisun, with his orchard of six hundred acres, putting stoves in each square of four trees—twenty-five stoves to the acre—fifteen thousand stoves to fire up and keep going!

In the same volume, page 103, Professor Budd, of Iowa, says of pears: "We have not one ironclad." In California we don't know what fruit men are talking about when they speak of "ironclads." Fruit men east are searching out varieties grown as near the north pole as possible, in the hope of finding genuine "ironclads."

In volume 3, page 115, is a paper on "Success and Failure," submitted by Mr. George J. Kellogg, of Wisconsin. It is one wail of failure, with little ray of success to relieve the picture. I cannot ask you to bear much longer with me, but as a specimen let me quote what he says about cherries: "About every third year we raise nearly enough for the 'dear little birds.' The three varieties they like best are the Early Richmond, Red English, and Late English Morello. These give a succession to other fruits, and no doubt save the life of many a songster. Therefore, cherries are both a success and a failure."

I think Mr. Kellogg's philosophy, in the face of disaster, must have been reinforced by gazing on shipments from California of Mr. Leonard Coates' Centennial or General Bidwell's Napoleon Bigarreau cherries, laid down firm and sweet, at reasonable prices, at Mr. Kellogg's door.

The apple is largely grown, when not a failure from some seasonal disaster, in Ohio, Indiana, Michigan, Illinois, and most of the New England States. In Minnesota, Iowa, Wisconsin, Dakota, and northern Nebraska, even the apple is almost despaired of, says Mr. VanDeman, owing to the ruinous effects of the severe winters. But we do not compete in apples.

The peach grows in a few States, and when they have a good crop, our market is affected as to dried fruit somewhat; but we are earlier in the market with our green fruits, and besides the maximum peach crop of the East can never supply the increasing demand. In 1887 there was almost a total failure.

The plum is grown East to a limited extent only. The curculio is a universal and deadly pest. Besides the foreign varieties common here are not grown there, and prunes as we know them are unknown there.

Some pears are grown, but are not in our way in any manner whatever.

A few varieties of excellent table grapes are grown, but our foreign varieties are unknown, except as we send them.

To my mind, eastern competition in fruit grown there is not a serious factor in our problem, and so long as the enlightened policy of government protection to home products is pursued, we have nothing to fear from foreign countries.

The long list of fruits peculiar to this State will not grow shorter, but will be increased. We will raise dates, and possibly bananas. We will cease importing currants from Greece, and supply them in California.

In this discussion, I have not dealt with grapes for wine, and yet all intelligent observers predict great results for that industry. We are making large quantities of wines of great excellence, and choice grape brandy. Probably one hundred and fifty thousand acres are already in wine grapes.

The wine imports of the country are valued at port of shipment at $7,056,085. Import values give the minimum value, and often are fraudulently valued.

The true value of most foreign importations is much greater than the invoice value at port of shipment.

I have thus presented the case submitted to me. I am conscious of the imperfect manner in which I have dealt with our wheat and fruit industries.

If I had been allowed, without wandering from the question, I would have shown the wheat grower how much better it would be if he devoted some of his land to alfalfa and other grasses or forage plants, if he don't like fruit. He will smile when I tell him that the hay crop of the United States in 1886 was valued at nearly $40,000,000 more than the wheat crop; that even in California our hay crop was valued in 1886 at nearly half the value of our wheat. With the exception of corn, hay is the most valuable agricultural crop grown in the United States, and the average value per acre is greater than that of wheat. Corn is king, and hay is heir apparent to the throne in the United States, unless our fruits overtake and pass them both.

To the fruit grower I would like to have given some sound fatherly advice, born of experience, but no doubt this will be supplied before we adjourn, and by more competent persons. I leave the question in your hands.

On motion of Professor Husmann, the thanks of the convention were tendered to General Chipman for his able essay.

The convention then adjourned until the following morning at nine o'clock.

THIRD DAY'S PROCEEDINGS.

CHICO, THURSDAY, November 22, 1888.

DRYING AND CANNING FRUIT—FIG CULTURE IN CALIFORNIA.

Remarks by H. E. PARKER, ESQ., of Penryn.

I shall not attempt, in addressing this convention as to the fig, to do anything more than to refer to the matter of the varieties, for within the last year there have been two very exhaustive essays in regard to the fig presented to the Fruit Growers' Convention—one by Dr. Eisen, of Fresno, the other by Mr. Williamson, of Sacramento—both of which are published in the biennial reports of the State Board of Horticulture, and I could do nothing more than recapitulate what they have said. There are, however, two or three points that I will mention before I introduce the subject of a particular variety.

We know, in bringing the fig before the public, that it is neither a new fruit nor a new industry. For we know the raising of the fig is from antiquity, but the growing of the proper variety for market in this State, as an industry, is as yet in its infancy. We find that a great part of the old world has produced these figs for ages; we find that the culture has been very extensive in some districts; we find this fruit in Egypt, in Greece, especially in the Grecian Archipelago, in Asia Minor, and on the Asiatic Coast. And we find that it has been introduced from the old country to our own country here, and grown in the Southern States quite extensively, not for market as a commercial product, but as a table fruit. We find this fruit grows in Central America and New Mexico, and we come to the last place, which I deem the true home of the fig—California. I think we can prove to the world that we can raise a superior quality, if not excelling the famed fig of commerce. We can get some idea of the magnitude of the fig industry in the old world. We find, in 1884, that twenty-one million pounds were exported from Smyrna alone, and from other European countries probably as much more.

We find, from the San Francisco "Bulletin," something about the importations of figs to this country. At New York there were received eight million seven hundred and forty-three pounds, the value of which was $375,283. Boston received over one million pounds, valued at $73,000, and miscellaneous receipts, seven hundred and fifty-two thousand two hundred and one pounds—an aggregate of about nine million nine hundred and sixty-seven thousand three hundred and fifty pounds, or $496,835 worth.

The consumption, therefore, is immense, and if we, in California, can grow something of our own home production to supplant these importations, what a great advantage it will be to us as fruit growers.

CREDIT FOR INTRODUCING A SUPERIOR FIG.

I think that great credit is due to the Bulletin Company of San Francisco for their efforts to introduce into California something superior to what we

have had in the past, and most of the members of the convention are familiar with the fact, that in 1882 they brought to this country a quantity of fig cuttings, which they obtained through United States Consul Smithers at Smyrna, and distributed to the subscribers of the "Bulletin" throughout the State. Some of the same importation was grown by W. B. West, of Stockton, and Robert Williamson, of Sacramento. They planted the cuttings in nursery, and until two or three years ago they were not placed on the market. Three years ago Mr. Williamson offered some of his rooted cuttings, and I purchased two of them, not knowing what I was getting, but as they were asserted to be a fine variety of figs, I planted them in the foothills of Placer County. I have fruited them two years, and the result I bring before you to-day. I was not aware of the value of this fig until it fruited the first year. As it grew upon the tree I saw it had a beautiful appearance, and as I tasted it I found that it was superior to anything I ever tasted before in the way of a green fig, although I do not deem it a very good fig for table fruit, because it is too rich for that purpose. But on drying I find that it produces a fig which I think will prove in the future to be superior to the real fig of commerce. Similar to the experience of others, I made some mistakes in endeavoring to manipulate my figs, and spoiled about two thirds of my crop this year trying to make something out of the fig according to the directions I received of the drying processes used in Smyrna. In disgust, during the second week in September, I put out the fruit to dry, without any dipping processes whatever, thinking it would prove its own merits. Therefore I gathered my fruit and simply submitted it to a ten-minute bath of sulphur vapor directly after picking. Then I placed them in the sun and dried them, as I have said, without any dipping or other manipulation. These figs I show you to-day; they speak for themselves, and do not need any recommendation. I have before me the imported article, and exhibit, side by side, two figs—one imported from Smyrna direct, and the other of my own production. The difference is in favor of the California fig, because it is almost transparent, while the genuine Smyrna is cloudy and more opaque. Therefore, I say we can raise the superior fig in this State.

In September I sent some specimens to the "Bulletin" Company, they having been so kindly interested in importing the trees, and they were submitted to a test by some experts in San Francisco, and I will read their decision in regard to the matter from the San Francisco "Bulletin" of October twenty-third: "On actual comparison with the best new crop of Smyrna figs that could be found in market, they were pronounced superior to the imported by such experts as Professor E. J. Wickson of the "Rural Press," and the following merchants: A. Lusk, L. G. Sresovich, and G. Onesti. Mr. Lusk, who, by the way, has handled imported figs in large quantities for years, remarked that if California can produce such fruit as that, we have no further use for the Smyrna."

These gentlemen are all well known in this State, and their word is reliable.

WHY THERE ARE NO MORE SPECIMENS.

Now, the question may be asked why none others in this State have produced this fig. In conversation with Mr. Rixford he stated that in this importation there were several varieties; that in procuring them the Consul had to use hired help; that he sent out an Armenian to procure cuttings and he had to go seventy-five miles from the home of the Consul. These figs were brought here, and we find from their growth throughout the State that there must have been from three to five varieties among them. The

greatest number seem to have dropped their fruit in every place but two. Mr. Rixford told me there was one tree in Vaca Valley that resembled this, and bore its fruit year before last, but I believe this last year its fruit dropped. My trees began to bear the second year after planting, bore a full crop, though it was a small tree, and has also borne an immense crop this year, and never has dropped its fruit. It has this peculiarity, the fruit never sours on the tree nor in the drying process, so far as my observation goes. It is a greenish color in its early stages, but when it begins to get ripe it turns to a yellowish amber, white and yellow, you might say, drooping upon the stem, and yet the fig will remain and cure hanging upon the tree without souring. You cannot say that of the White Adriatic, though it is a splendid fig, properly handled, nor any other fig known to our public.

Another pronounced difference between this and the other trees is its wonderfully vigorous growth. These trees were planted three years ago last spring, then about three feet high, a little larger than my finger and without branches. To-day they stand fourteen feet high and the circumference, say a foot above the ground, of one of them is twenty-two and one half inches and the other eighteen or nineteen inches—showing that they are the most wonderful growers of the fig family, healthy and robust in appearance and beautiful in foliage.

SAMPLES OF FIGS EXHIBITED.

I am supplied here to-day with Mr. Denicke's far-famed fig. I am not here to say a word against the White Adriatic. It is one of the finest figs we have in this State, and one which will have a commercial value in the future as a fruit fig, but to say it is identical with the figs of the "Bulletin" importation is a stretch of the imagination, to say the least. His sample has been processed, while mine is sun-dried, without any treatment whatever. I wish to submit them to a committee to examine, not asking you to take my word for it.

About the time the discussion came up I cut a branch off my tree and sent it down to San Francisco to Mr. Rixford, and the same day he procured the genuine White Adriatic fig, and had them photographed. The photographs are before you. Those on the left are from my tree, from the "Bulletin's" imported cutting; the other from the White Adriatic. The White Adriatic is an elongated fig, the skin very much thicker than the "Bulletin's" Smyrna, which is of much rounder form. The other photograph shows the interior appearance of the two figs. My fig, which was cut open for photographing, was taken off the tree about ten days ago, and was, therefore, grown in the cold, damp weather of our fall, and the skin is thicker, and the seeds further apart, and the center open; while the fig in the best state is firm, and jelly-like in the center, seeds very small, and no openings such as you see in the photograph.

POINTS OF INTEREST CONCERNING THE SMYRNA FIG.

Since the publication of the character of my fig in the "Bulletin," I have been overwhelmed with inquiries and applications for fruit and leaves for comparison. I have been obliged to refuse, because it would have defoliated my trees to accommodate the applicants. I have also been besought for cuttings, but I did not come before this convention to peddle figs. I am glad, however, that so wide interest has been awakened, and that there is such general disposition to secure the best possible varieties of fruit for California. I believe that we have in this fruit a bonanza for California,

because there is not a hillside in the interior of this State but what will bear these figs. We believe that the foothills in this part of California are peculiarly adapted to this variety of fig. It may grow in the valleys, but I have an idea that you have to wait longer before it comes into bearing than you do in the hills, and that is the reason why we have had success in its fruiting. This is to be tested. The "Bulletin" Company have a great many of these trees in nursery in Alameda County, which they are going to take up as specimen plants, with large roots, and box and send them to the hills of Placer County, so as to know whether the tendency to drop the fruit is arrested by growth in the foothill situation. These results will be published as soon as ascertained.

There is much diversity in the shape of the leaves of a fig tree. On the same tree you will find leaves of different shapes, some deeply cut, almost no base, and some have fluted sides. You cannot tell much by the leaves, but the wood has peculiar characteristics which you may discover. Now, gentlemen, I submit these figs for your examination, and all I ask is an honorable decision of the fruit on its merits. I am simply a horticulturist, growing these things at home, and taking pride in anything that is good. If any one has a better fig, I will congratulate and shake hands with him, for I am working in the interest of agricultural growth in this State.

CONFIRMATORY EVIDENCE.

P. W. Butler, Penryn, Placer County, said: "I am a neighboor of Mr. Parker, who shows this fig, and also one of those who were fortunate enough to secure some of the "Bulletin" cuttings. However, those that I secured dropped their fruit. My attention was called to the trees referred to by Mr. Parker about two years ago by the fruit shown at the Citrus Fair held in Sacramento. I had been acquainted for years with the fig of commerce, having dealt in them extensively, and I noted particularly the fine quality of Mr. Parker's figs. On my place I have now some fifty fig trees; among others, the Ischia and White Adriatic, as grown by Strong & Co., of Sacramento, so I am familiar with the varieties, and certainly, Mr. Parker's fig is entirely different. As shown by the picture, his fig is very much more globular in form, and there is no comparison as to the quality. I have never seen any California-grown fig that compares with it. I consider it the most valuable acquisition that has been made to our fig varieties, and if I were planting figs, and could get this variety, I would take no other, no matter how much it would cost."

Dr. Edwin Kimball, of Haywards: "From my experience and observation on figs, I believe that probably the best figs in the world were introduced here at a very early period—a long time before the "Bulletin" importation. There are scattered fig trees in many portions of the State which have been entirely neglected—whose names are entirely unknown—that produce a superior article of figs. I have found old trees in Alameda County exactly resembling the White Adriatic fig, and I have found those resembling very nearly that shown by Mr. Parker, in some portions of this State, and I think the only way to determine the exact character and status of the fig is by a close comparison of its leaf and its habits of growth. Of course, fig trees differ according to their location. A fig grown on the coast, one grown in the hot alluvial valleys, and one grown in the foothills, will produce three distinct varieties of fruit. While the heavier yield might be grown in the valley, probably the highest flavor would be found in the foothills, and that grown on the coast would be far inferior. As to the early importation of choice varieties, I would say that I saw a box of what was

represented to be White Adriatic figs at the Los Angeles convention three years ago, and Mr. Milco assured me that they came from a large tree twenty-five years old, from White Oak Flat, up in the foothills."

E. Booth, Roseville, Placer County: To support Dr. Kimball's theory I must say that I have been collecting figs for the last twenty years, and have trees now sixteen years old, and some three or four years old, and you would not believe the fruit was of the same variety, though one was propagated from the other. I have gone to see the tree I have propagated my trees from, and I could not recognize it. This shows the difference in trees of different ages and growing in different localities.

W. G. Klee, Glenwood: I happened to meet Mr. Rixford of the "Bulletin" one evening, and he told me about having received the specimens from Mr. Parker. Naturally being interested in settling this question, I secured from John Rock, at Niles, a number of specimens of the White Adriatic fig, and I took them to the rooms of Mr. Rixford. We compared them very particularly. The figs were both in the green state, as they came from the tree, having been picked only a few days. In cutting them open we found that the meat did not seem to differ very materially, at least, that was my opinion; the color was about the same, the skin of the White Adriatic was somewhat thicker, but the most striking difference was, of course, in the shape, as you see by the photograph. That was too marked and distinct to escape anybody's notice. The product as dried shows still greater difference, as Mr. Parker's specimens prove. His Smyrna fig dries quite transparent, while the specimens of the White Adriatic that I have seen do not. In my mind the question of the identity of the Smyrna fig of commerce and that of Mr. Parker is settled. It is impossible to tell them apart. I think it will be proved that the Smyrna fig of Mr. Parker is well adapted to the foothills, and I believe it will also be proved that the White Adriatic is adapted to a greater range; it will be an inferior fig, but it is very likely that its greater yield and its greater adaptability to a wider range will secure for it a great future. It is an excellent fig, and I think no one having planted it need feel discouraged. But Mr. Parker's fig, I am satisfied, will be much the best, and is as distinct from it as anything can be.

THE SMYRNA FIG IN SAN DIEGO.

F. A. Kimball, National City: I examined with a great deal of interest the specimens shown by Mr. Parker. I have seen but one sample of dried fig in my life superior to it. I have made a great many examinations, particularly in my own county of San Diego. There was one sample of figs exhibited at an exhibit at Oceanside, and now in the rooms of the Board of Trade in San Diego, which seems to me identical with that fig, and they were grown from a tree of the "Bulletin" importation, and packed by the Escondido Land Company. I see no difference in texture, in seed, or color, either inside or outside, except in the thinness of the skin. The skin of the figs packed at Escondido is much thinner than these here, but the shape and all the characteristics seem to be identical. I have examined many kinds all throughout the county and taken pains to compare the figs that have been grown there for the past twenty years with the White Adriatic fig which I procured from Mr. Eisen of Fresno, some two hundred to three hundred cuttings, and distributed throughout the county to learn how they would be affected by the different localities, and I found many of the figs which have been planted within ten or twelve years, are practically the fig as claimed by Mr. Eisen to be the White Adriatic. I see no difference in fruit or foliage. There seems to be no insect enemy of the

fig, so far as I know, and I think, among the industries of the State, there is scarcely anything superior to what this fig may be. All portions of the State almost are adapted to the cultivation, and if we can succeed in getting a fig, such as Mr. Parker has here, or such as the gentlemen in San Diego have, and which I believe to be the same, there is no exaggeration of the benefits to be derived from its propagation.

Dr. Kimball: I move that all parties that are interested in the cultivation and growing of the fig, be requested to forward to the Secretary of the State Board of Horticulture, in the middle of the week preceding the last Friday in July and September next, specimens of the fruit of the fig, its leaves and its twigs, accompanying the same with a statement of the locality and climate and as much of the history of the tree as he can give.

Carried.

SPICED FIGS.

Mr. Gray, of Chico: We should not forget our old California black fig. A merchant from Chicago told me last summer that we could not put up too many figs, that is, spiced according to a recipe given me, adding a little ginger. He said that a few kegs had been brought to Chicago, and they went off like hot cakes, and they didn't begin to supply the demand, and that if the people of California who had these large, fine black figs were to put them up in as nice shape, they could sell every one of them at a good profit. This is the recipe: Spiced figs.—To ten pounds of ripe figs take one quart vinegar; one fourth pound spice mixed of the following kinds: cloves, allspice, cinnamon; put all together and bring to a boil, then add figs and boil till tender; scald for three successive mornings, then add one cup preserved ginger.

SHALL WE CAN OR DRY OUR FRUITS?

Essay by R. C. Kells, Yuba City.

On receiving notice that I had been selected as one to prepare an essay at this convention on the subject of "Shall we can or dry our fruits," the thought came to my mind very forcibly that material to prepare an essay on such an important subject as this one must be getting very scarce; but as the subject is a very important one, and near to us, I feel that it is my duty to bring this subject before this convention that we may have the opinion of all fruit growers, as well as fruit canners and driers; because I think all present not only feel a greater interest in fruit culture generally than ever before; and after years of thought and labor the questions come to us, "What shall we do with the vast amount of fruit now being and which will be produced in the near future throughout this glorious State—California?" "Who shall we look to for consumers of these fruits, and after finding consumers, how shall we prepare our fruits for them, canned or dried?"

We will for a moment see what our consumers have done for us in the way of canned and dried fruits in 1887. As near as we can get at it there was used in 1887 in California in canning about sixteen thousand tons of fresh fruit; there was shipped of fresh fruits, about twenty thousand tons; there was used to make dried fruits (outside of raisins), about twenty thousand tons of fresh fruits. We see by these figures that there were four

thousand tons more green fruit used in making our dried fruits than was used in canning the amount which was canned in 1887, and the same year our canners had enough canned fruits to supply home and eastern markets, and enough to fill large orders in Europe; thus showing that the sixteen thousand tons of fresh fruit canned about fills the demand of California canned fruits. There were consumed in the United States of dried fruits about two hundred million pounds, of which California only furnished twenty-six million pounds and foreign countries one hundred and seventy-four million pounds—about in the proportion of one eighth of California production to seven eighths of the foreign. These two hundred million pounds of dried fruits include all dried fruits, raisins, prunes, etc.; thus showing that California must make seven times as much more dried fruits as she now does before we think of having the market supplied, which calls for one hundred and forty thousand tons of green fruit, outside of raisins.

For one I do not see how we can expect to find markets for seven times as much more canned fruits than we now put up; but on the part of dried fruits we surely have an unlimited market. I will give in detail the dried fruits made in California in 1887, which are as follows:

Raisins	16,000,000 pounds.
Prunes	1,825,000 pounds.
Peaches, sun-dried	1,750,000 pounds.
Plums, sun-dried	400,000 pounds.
Pears, sun-dried	40,000 pounds.
Grapes, sun-dried	600,000 pounds.
Apricots, sun-dried	200,000 pounds.
Nectarines, sun-dried	100,000 pounds.
Apricots, evaporated	3,500,000 pounds.
Peaches, evaporated, peeled	50,000 pounds.
Peaches, evaporated, unpeeled	750,000 pounds.
Plums, evaporated	50,000 pounds.
Nectarines, evaporated	50,000 pounds.

Making a total of twenty-five million seven hundred and sixty-five thousand pounds, which calls for one hundred and eight million eight hundred and fifty-five thousand pounds, or fifty-four thousand four hundred and twenty-seven tons of green fruit, to be consumed in making dried fruits and raisins; or outside of raisins, four thousand eight hundred and eighty-two tons of green fruits.

As I said in the beginning, who or where are the customers for this fruit? They are our friends and relatives of the Atlantic States.

The question arises, "Why do they ask for our dried fruits rather than our canned?" for they say that our canned fruits cannot be excelled nor even compared with any other canned fruits throughout the world. Their answer is, "We are not able as a people to eat your canned fruits, but we are able to eat some of your dried fruits;" and to-day it stands us in hand, as California fruit growers, to do something toward getting our dried and canned fruits into the mouths of the eastern consumers, as the question has solved itself to the matter of dollars and cents, as they say it is not the quality of our fruits so much as it is the price. We hear more complaint on the part of our dried fruits than the canned. Why should such be the case? I know of no reason other than that too much carelessness on the part of the average California fruit grower in preparing his dried fruit for market. The cost of selling a pound of poor fruit is greater than that of good, while the freight is the same, and at the same time losing our reputation as growers and packers. Let us when drying our fruit do away with the Grecian or Spanish system, as well as the so called "Chinee" system of swindling our eastern customers with so much filth and dirt, while with a trifling cost more we can supply all the markets with good,

clean, and wholesome fruit, whereby we will find ready sales at living prices; and our eastern friends will say to the Turkish prune, the Spanish raisin, and, oh! the Grecian currant importers, "Thank you, we are done buying dirt and trash; we will try for a change the California prunes, raisins, currants, peaches, plums, nectarines, etc., and take less chance of contracting some loathsome disease."

Now, Mr. President, I have no doubt when I have finished reading this poorly constructed essay, that I will be classed as an advocate of fruit drying exclusively; and yet, while I am directly interested in fruit canning, I feel that fruit drying needs our most careful attention, as all growers are driers more or less, while canning is conducted by a few individuals; and fruit canners have studied and learned the wants of their consumers; hence the reputation of California canned fruits. Why not make our dried fruits gain as great a reputation, first, by making a good article, placing it on the market, avoiding the usual two or three commission merchants as in the past; second, by asking railroad companies to give us living freight rates; there being no question as to our having fruit of the very best quality, and in great quantities. The question is, "Shall we can or dry our fruits?" My answer is, "The time is not far hence that drying of our California fruits will be first on the list; for as sure as our eastern friends find that they can get our dried fruits in quantity, at living prices, the result will be, they will eat less pork and cabbage and more fruit and fritters.

DISCUSSION ON FRUIT DRYING.

General Chipman: There is lamentable ignorance among fruit raisers as to the best method of drying fruit, so that the interest itself is suffering by reason of that ignorance, and it is also suffering by reason of uncleanliness on the part of the Chinese who are engaged in the business of drying, and some steps ought to be taken to protect the fruit interests of this State against such a way of operating. In the neighborhood of Vina, near where I reside, there are about two thousand acres leased to Chinamen, from ten to one hundred and sixty acres to a company, and the way they do is to get at about the average time of ripening of the whole fruit of a tree, instead of pursuing the course of an intelligent grower, of taking the fruit as it comes picking time—they take the average result of a tree and go with sticks and knock off everything on to the ground into the dust, and then it is gathered up, carried in a most slovenly and dirty way to dirty places, where it is handled in a dirty manner, and green, ripe, and over-ripe all mixed up, and comes to the market and is mixed with your fruit and mine, and there is no way to identify that, and our fruit suffers in reputation by reason of that method. There ought to be some way to put a brand upon that kind of fruit drying in this State; men who are engaged in selling fruit ought not to take it and mingle it with the dried fruit of Vaca Valley, or undertake to sell it as second or third rate with the Vaca Valley fruit, or the Suisun fruit, or the Marysville or any other fruit, as is done, for it does very great harm to the industry here. As to the best method of drying fruit, there is great ignorance in my country. Most of the fruit men are young in the business. The matter of bleaching was unknown there until quite recently; it was looked upon at first as a mystery, and many of them were not even told how to do it; they had to experiment in that direction, and I hope some one will tell us, in a brief way, the best way to pursue.

Mr. Cooper: I will state that the fullest discussion of this subject was held at the Santa Rosa convention, and is laid down in our third biennial report; it is almost impossible, in my way of thinking, to improve upon it.

Mr. W. W. Smith, of Vacaville: With your permission, Mr. President, and that of the convention, I will give you our process at Vacaville for drying fruit, and I will give the process of drying apricots, as that is the first fruit we began to dry on; and the rule in regard to drying apricots will hold good in drying all of our other fruits, unless it would be in making raisins or drying grapes; in that, I fancy a little different way of proceeding would be necessary. In the first place, I want to say that it is utterly impossible to make a good article of dried fruit out of a poor article of green fruit. Your ladies might just as well undertake to make a silk dress out of a bolt of calico as to make good dried fruit out of poor, immature fruit. We let our fruit get thoroughly ripe, in the very best eating order, just as you would like to go and pluck an apricot from the tree and eat it right there; too ripe to ship. You cannot make good dried out of green or immature fruit; bear that in mind. Let your fruit stay on the trees until it is thoroughly ripe; pick carefully; don't shake it off on the ground, as the gentleman says the Chinamen do, but pick it from the tree carefully in baskets and haul it to your cutting shed—not on a common stiff farm wagon; if you do, you will have it badly bruised by the time you get to the shed, and every bruised spot in the green fruit shows a dark spot in the dried fruit. Haul it in a spring wagon. We cut the fruit and lay it on trays, which are generally made of lumber two by three feet—you can get them made at the box factory generally by taking a board or plank a foot wide and an inch thick, cut it in two, and that makes two boards half an inch thick and a foot wide; they are three feet long; they are cleated together with two or three cleats, and a cleat around the outer edge. The fruit is cut, laid on those trays, and immediately put in the sulphur box and sulphured for about forty minutes—an hour is better for a good dried article; I would advise sulphuring for one hour. There may be and probably is an objection in the minds of a great many people to this thing of sulphuring fruit—bleaching, as some call it. It does not bleach the fruit; it simply closes the pores, and prevents the fruit from turning dark, and stops it from coloring; the fruit is already bright when it is cut. The trays are taken from the sulphur box, and in our locality, where I think we have just such a climate as you have here—I think it gets just about as hot; we are free from fogs and dews, as I understand you are here—the trays are put right on the ground—sometimes we have an acre, sometimes two acres of land covered with those trays—where we can get a hillside sloping about 35 or 40 degrees, the fruit dries quicker, and the quicker you can dry the fruit the better it is. We dry our apricots in about three days from the time they are cut and put out in the sun, and we take up the dried article ready to box. When we box them, we use boxes made of seasoned sugar pine that hold twenty-five pounds; I think they are six inches deep, nine inches wide, and fifteen inches long, inside measure. With a common lever press or screw press, you can easily press twenty-five pounds of dried peaches, apricots, or plums into that box. The lumber is dressed on both sides, and we generally put them together with these thick wire nails; in fact, the last year we used that nail altogether in making all of our fruit boxes, because we find them to be the best; all things equal, they are the cheapest in the long run, and look a little better than the cut nail. We generally use threepennies for making peach, grape, and dried fruit boxes; for nailing the lid, we use any nail which is stout enough; for making crates, we use a smaller nail than that. After the fruit is dried and taken from the trays the rule is among most of us to pour it out or throw it into what we call shipping boxes, sixty-pound boxes that are used for sending fruit to the cannery in; we let it stay in those boxes

until we get ready to pack them into small boxes. Let the fruit get thoroughly dry, as dry as a chip if you have a mind to, and when you get ready to do the boxing dip it into boiling water. If you want to doctor it any you can do it, but when you simply dip it into boiling water you have got the pure fruit left without any doctoring; that is to destroy the eggs of the insect that makes the worm in dried fruit, and if there is any insect that will kill them. We use a wire basket made of coarse wire, with meshes small enough so that the dried fruit will not run out, and that, when you dip the basket into the boiling kettle, allows the water to pass through freely. Sink the basket into the boiling water, merely let it stay long enough for the water to permeate all through the basket, raise it out, dip it down again, and let it stay in about the same time; raise it out and let the water drip out, and lay the fruit in a pile on a table or a clean floor. We dip in that way what we think we can box during the next day. We throw in a pile that way in order to let the whole mass become damp or dry alike. In a single bucketful some of the pieces may be pretty wet and others dry; we throw it in a mass, and the dry pieces will take the moisture from the damp ones, and the whole pile becomes equally damp. Let it stay there until it gets pretty dry, so dry that there is no danger of its moulding after it is pressed into the box; and when we go to boxing we have a very fine oiled paper, and line the boxes with that; then we take some of the best specimens of fruit and spread them out with the fingers, and place them on a layer in the bottom of the box; in that lies paper that is put in the bottom of the box first; then we face the box with the fruit, and fill up the box, set it on the scales and weigh exactly twenty-five pounds of fruit into the box; take it out and put it under a press, a screw press or a lever press—we have a lever press in our neighborhood, it is patented in Oregon, which is much more speedy than a screw press and does the work equally well; it is not made quite stout enough, and we often have to take it to the blacksmith shop and have stronger pieces put on top where the lever works; with the exception of that it works very well, and is very speedy. When the press is put on the fruit and it is packed into the box enough to put the lid on, we slip it out and nail the lid on and turn the box, and when it is opened to the market this faced box is shown, the same way as in packing cherries. Sometimes we put it into fifty-pound boxes instead of twenty-five.

A Delegate: When you put green fruit on trays do you turn it?

Mr. Smith: We put it on trays with the cup side up and dry it—no need of turning it. That is the way we dry our apricots and peaches. We dry no apples or pears; we dry plums and prunes. In cutting peaches there are a great many clingstone peaches raised in Vaca Valley, and we got so in the last year or two that we prefer those to the freestone peach for drying, and we have a knife that we can cut clingstone peaches as fast as we can freestone. A great many men prefer to pit clingstone peaches to freestone; ladies do not because it is pretty hard work on the wrist, and ladies and girls are hardly strong enough, but I have seen men who could pit more clingstone peaches than freestone.

Mr. Butler: What is the knife?

Mr. Smith: It is a knife made in the shape of a common shoe knife with a little bent blade on the point of it like that, and two little springs; they are made sharp—and any knife must be kept sharp. They are made of spring steel so that you can open them or close them up to fit the size of the pit of the peach or apricot; you fit them right into the stem end and turn the knife one way and the peach the other and it will come right around as smooth and nice, so that a man that has the hang of it will take a pit out as nice as a freestone peach. We have used also what they call

the spoon knife, but that is slow, tedious work and does not pay to cut peaches with this spoon knife to dry them, it takes up too much time unless you can get the labor cheaper than I do.

GENERAL CHIPMAN: Will you explain what you mean by doctoring?

MR. SMITH: I thought everybody knew what it was to doctor fruit. I mean to put it through different kinds of processes—salt and sugar, and all those kind of things, to make it look nice. The way to make dried fruit nice is to keep it clean while you are at work on it; keep it out of the dust and out of the dirt, and make your cutters keep their hands clean—plenty of water while they are at work; if you see one with his hands dirty make him go and wash his hands. At our place last year we used girls and women cutting fruit.

MR. CHIPMAN: Do you consider it any advantage to dip into glycerine or anything of that kind; does it add a market value?

MR. SMITH: So far as my experience goes there is no advantage in it; all I can see, it adds to the looks of the fruit, and frequently sells best; it does not add anything to the value of the fruit whatever for food, but it makes the fruit sell better, and that is all the value there is in it.

MR. HATCH: Wouldn't it be well to use it on poor fruit and not on good fruit, and do those who put up first class goods, after they have tried it, use it any more on good fruit?

MR. SMITH: No, I think not; as a rule it is used on poor fruit. I was about to speak in reference to peeling peaches; this year's experience has taught us that there is not enough difference between the price of peeled and unpeeled peaches to pay for the peeling. Last year a great many of us tried peeling peaches with lye; this year we all gave it up, and I do not know a man in the Vacaville district that is peeling peaches this year with lye; we got sick of it. The peaches would turn dark after they were peeled and dried, and even after they were shipped to the East they would turn dark in the boxes and very materially injure the sale of them, so they all quit it, and in peeling this season used a knife and a machine. There is a great difference in the varieties of peaches that are used to dry, that is for profit; some varieties will make, I was going to say one third more fruit than others, and that is quite an item for a person who is planting an orchard to know what variety to plant if they are going to dry the fruit. The Muir is one of the best drying peaches I know of. If I were selecting an orchard of peaches where I expected to dry my fruit, I would plant largely of that peach. The Susquehanna makes a finer article of dried fruit than the Muir, but it dries away more, it takes more pounds of green fruit to make one of dried than the Muir. The Muir is a perfect freestone, very solid and very dry peach to begin with, consequently it dries away less than any other peach I know of. In regard to drying our apricots there is very little difference; we pit them and put them in trays with the cut side up, and lay them on carefully so that they will not more than touch one another, put them into the sulphur box as quick as we possibly can, because, as you know, it commences to change its color almost immediately after it is cut, and the quicker you get it into the sulphur box the quicker you stop that discoloration and the better your fruit will be after it is dried, and that will be one main point in drying fruit, it will be that much better after it is dried; you let a dried fruit buyer come to your house, he takes up one sample of it, that is too dark, he takes up another, "Very good looking sample, I will give you so and so for that," and you will see it makes a difference of several cents to you if you have it dried nice and sulphured properly, and the riper you have it, so it won't run, the more transparent it will be. We have a kind of a machine down there that we use for taking the

dirt off of the peaches and apricots after the fruit is dried, and also takes the fuzz off of the peach. It is simply a drum made of wire, some three feet in diameter and maybe four feet long, that will hold perhaps a hundred or a hundred and fifty pounds of dried fruit. We put the fruit into that and revolve it round and round, and it will astonish you the amount of fuzz and dust and other stuff that will wear off of that fruit and drop out underneath; have that drum on a little frame, so that it will be off the ground, and turn it like a grindstone, and it will also astonish you to see how much it adds to the looks of the fruit. One of my neighbors, who dried nearly a hundred tons of fruit this year, had one of those machines, and he run through it most of his dried peaches. I think he had forty-five tons of dried peaches, and he run nearly all those through one of those machines, and he told me that he got over six bushels of fuzz and dust and stuff off his fruit that fell through that wire on to the ground underneath. In all the processes of handling, packing, boxing, and sacking of your fruit, if you sack it, be as neat as possible about it, because at the time of year we are drying our fruit there is more or less dust flying everywhere; even when you get as far back from any public road as you can, the dust will rise and settle on your fruit, and if the fruit is freshly cut every particle of dust that settles on it sticks there, and when you run this through the revolving wire it adds very greatly to the looks and value of it. In drying prunes we allow the fruit to get thoroughly ripe on the trees; so ripe that it will begin to dry up of itself; so far as that is concerned it is all the better if it shows signs of shriveling up or drying on the tree; pick it from the trees carefully; a good many men shake the prunes from the tree; I do not like to see that; they drop on to the ground, and some put a sheet under the tree and shake them on that; you shake off a great many leaves and twigs and trash from the tree with it, and it is a very difficult matter to separate them; the best way is to pick prunes from the trees by hand; take them to your packing shed and dip them in boiling water; some use lye, but that is unnecessary, for boiling water will crack the skin about as well as lye and will hasten the drying process, and that is the only reason I know of for dipping them into hot water, for the prune dries very slowly without they are dipped; they are put on trays similar to peaches and apricots, and allowed to stay there until they get dry, and they are taken up and boxed or sacked, as the case may be; most people send their prunes to market in white muslin sacks, though some have boxes about the same as they do for apricots and peaches.

Mr. Aiken: How long do you dry the prunes?

Mr. Smith: We dry them until the moisture is out of them—until they are dried through. You can tell that by taking up a few specimens and breaking them open, and whenever they are dried through to the pits they are dried sufficient to keep.

Mr. Gray: Do you dip your prunes after they are dried?

Mr. Smith: Yes, sir; after they are dried and we get ready to box them we dip them in boiling water or boiling lye, and that softens them up again and puts them in good order for packing or boxing. Now, I want to go back a little and speak about insects: In dipping the dried fruit in the boiling water to kill the eggs of the insect that make the worm in dried fruit, those eggs are deposited in the dried fruit while the fruit is on the yard drying; there is a little miller something like the codlin moth that lays the egg in the fruit while it is on the yard drying, and if you go in the drying yard late in the evening, of a warm summer evening, you will see a great many of those insects flitting about over the trays, and you will have to be very careful or you will not see them, because they

appear just about the time it is getting dark; they are there depositing the egg in the fruit, and when the proper time comes and sufficient warmth is in the box or in the sack, as the case may be, that egg hatches and the worm goes to work eating up your fruit, and it will go through a certain number of transformations and come out again after awhile—may be the next year, if it is left alone—as a moth again. Dipping the fruit in boiling water kills the egg and stops that; still, even if the egg is not there, it will moisten your fruit and you can box it in good order. There is one little item that a lady neighbor of mine discovered. I spoke about flattening the fruit out with your fingers. This lady found out that running them through a clothes wringer would flatten them out nicely; it is quite an ingenious invention, and saves a good deal of time. The rule with apricots holds good with the drying of peaches and plums and all stone fruits that you have to dry, so far as I know, with very little variation. The only thing I specially urge, is to have your fruit clean and neat in appearance, and when you get to market fruit treated in that way will sell for a good deal more, and more readily, than if you put it up in a slovenly manner.

Mr. Hutchinson: I would like to ask you what degree of strength you use in sulphuring?

Mr. Smith: That will depend on the size of your sulphur box and the amount of fruit you have in it. Our sulphur boxes hold forty trays, some eighty. For a sulphur box that holds forty trays, I just take a little coal shovel and put a few handfuls in it, touch a match to it, and put it under the sulphur box and let it burn until it burns out, which will be in thirty or forty minutes for that amount of sulphur, and I take it out and put it on the yard. If you have a larger box that will hold eighty or a hundred trays, you can use twice that amount of sulphur. If you have fruit only in a certain space in the box it is not necessary to have so much sulphur; you have to burn it so long; it ought to be subjected to the fumes of sulphur from forty minutes to an hour to make a good, bright fruit; an hour is better than less than that.

General Chipman: Some say twenty minutes, and I am a good deal in the dark; I would like to know the reason of it. I was lead to believe that an hour would destroy the fruit.

Mr. Smith: It does not injure it a particle. If I were going to make a very choice article of dried apricots or dried peaches, I would submit it to the fumes of sulphur from forty minutes to an hour, anyway; there is no danger in it; I can assure you of that, gentlemen; it is not deleterious to the health of the consumers at all.

Mr. Frank A. Kimball: Some of the fruit we have produced, that has been sulphured, tastes very sensibly of the sulphur. We have produced dried apples that tasted so very strongly that they were not palatable.

Mr. Smith: I am glad the gentleman mentioned that. From the little experience I had in drying apples—we dry no apples for sale in the Vacaville district at all—however, I have dried a few for my own use to experiment with, and found that the apple will taste of the sulphur. Apples will taste of the sulphur, and also smell, while on other fruit it does not. The pear may, too, but it does not injure the peach, or the apricot, or the plum, there is no disadvantage to them at all that I have ever found. I have sulphured from five minutes to an hour and a quarter to experiment with and see if it was injurious to the fruit in any way; if it imparted any unpleasant taste or smell to the fruit, and I have never been able to detect any in those fruits; but the apple, it does taste and smell; why it is I do not know unless the pores of the apple are more open than the peach and the apricot for the fumes of the sulphur to enter. If you put your peaches

or apricots into the sulphur immediately after they are cut, just as quick as it possibly can be done, I do not believe that the strength of the sulphur, or the fumes of the sulphur, enter the fruit at all; I think it is simply on the outside, and when it is taken out of the sulphur box and exposed to the sun, after three or four or five days drying, that it all passes off. It simply closes the pores of the fruit, as far as I am able to judge, and stops that coloring of the fruit; it adds nothing to the value of the fruit for food; it simply makes it sell better, and that is what we are all after.

MR. BOOTH: What process would you take in drying Salways and Late George's whether you get them perfectly dried in the sun?

Mr. SMITH: Yes, sir; we do. We dry our Salways at Vacaville as well as we can the Crawford.

MR. BOOTH: Do you not cover them up at night to avoid dampness?

MR. SMITH: No, sir; that is unless we have early fall or autumn rains, it is not necessary; we have no dews or fogs there to color them. It only takes from two to four days longer to dry, because the sun does not have the same power later in the season that it does in midsummer.

A DELEGATE: I would like to ask the genleman if he sulphurs the plums that he dries?

MR. SMITH: Yes, sir; pitted and unpitted too. The finest I ever saw was the Yellow Egg plum taken as they come from the trees and put in the sulphur box and put in the sun to dry, the finest article of dried plum I ever saw. A year ago last summer there were twelve evaporators erected in Vaca Valley, and they were every one discarded before the season was out, and the owners went to drying in the sun. Mr. Blum, a merchant in Vacaville, that bought four or five hundred tons this year, preferred sun-dried sulphured fruit to any other kind of fruit he could get. He will pay more for it and take it quicker and in preference to the evaporated fruit. I made the remark here last night that a man must study his own locality. If he is in the foggy portion of the State where he does not have sufficient sun he had better use an evaporator, but in such portions of the State as this and almost all parts in the interior of this State, away from the bay and ocean fogs, I see no use in using an evaporator of any kind, because in my judgment, and it is so considered in the estimation of many buyers, sun-dried fruit is superior to the evaporated, that is, both being sulphured. All buyers I know of insist upon fruit being sulphured.

MR. GRAY: I would like to call Mr. Smith's attention to one thing. He said that after the last dipping it would remain in the pile until packed. That might occasion a great loss to many young fruit driers, for I understand that during the night is the time when the moth will work on the fruit; that they may not touch the fruit in the daytime, but they will during the night, unless sulphur fumes or something else keeps them away.

MR. SMITH: Thank you; it calls my attention to one point that slipped my mind. In dipping the fruit, when we are preparing the boxes as I say, we throw it up in bulk so it will dry out evenly the whole mass—five hundred pounds, or five tons for that matter, whatever you expect to box; you dip it and pile it up that way, and it will moisten the whole mass alone, because the dry pieces will take the moisture from the damper ones, and in the morning—about ten or twelve hours—the whole mass will be moistened up just about alike. To avoid insects coming along at night and laying eggs, we cover it up with old sheets or muslin, so that the moth cannot get to it, or she would come along during the night and lay eggs in the fruit again and we would unconsciously box up a lot of eggs which in time would result in the destruction of our fruit.

Dr. Kimball: It seems to me the gentleman is using a great deal of sulphur in Vacaville, but if we are to use sulphur for the purpose of preventing oxidation of the fruit after it has been cut, we only need to use the amount requisite for the purpose. I acknowledge it makes it look white, bleaches it out, and gives it a nice appearance; but I believe that fifteen or twenty minutes to half an hour is sufficient time to submit any kind of fruit to the action of sulphur, that is if it is intended to be eaten. Now I have seen peaches and apricots and apples and pears frequently that were totally unfit for human consumption in consequence of the enormous quantity of sulphur that had been sublimated and condensed on the surface of the fruit. When I commenced using it I did so with a good deal of trepidation, and used it only ten minutes at first, not enough to produce the requisite bleaching; but I do now after a good deal of experimentation.

General Chipman: I would like to ask whether the dipping in hot water, besides killing the insects was not also intended to expand the dry or shriveled fruit?

Mr. Smith: The object in dipping the prunes into boiling water or lye is simply to wrinkle or break the skin and hasten the drying process; this is before drying, immediately after taking it from the tree; dipping any of our dried fruits in boiling water or lye, as some do, of course restores a great deal of moisture to the dried fruit, and I will give you a pointer that may be worth something to you, the dried fruit will take up moisture enough to pay all the expenses of boxing your fruit, and nobody is injured by it, because the fruit itself is benefited—one of my neighbors told me that he added twenty-six to the one hundred pounds of his dried fruit by dipping; that I think is an exaggeration, but it will take upon an average about 10 per cent of dried fruit to dip it in boiling water and let it drain and dry off again until it is about moist enough to box, and this brings back a good deal of the natural flavor and natural taste of the fruit as a rule, besides killing the insects that are in it.

Mr. Butler: May I ask if the moisture of that fruit does not cause some discoloration?

Mr. Smith: Not much; no, sir. I will qualify that, that it does not change the color of sulphured fruit but unsulphured fruit it does.

Mr. Butler: I have noticed it in unsulphured fruit.

A Delegate: Let me ask whether you sulphur dark plums for drying? Is it not only necessary in light colored plums, and can you see any difference in plums that are dark colored?

Mr. Smith: It is not essentially necessary in dark colored plums.

Mr. Hatch: This year I sulphured my French prunes before drying, and they were as yellow as gold, and I sold them for a half price more than I ever have before; the man who bought them branded them "Golden Prunes."

Mr. Stabler: Do you always use the flour sulphur in bleaching?

Mr. Smith: Yes, sir.

Mr. Stabler: I found much better effect with brimstone sticks, they bleach in seven to ten minutes.

Mr. Smith: I am inclined to think that is where Dr. Kimball got his fruit that was so badly affected, that it had been sulphured with brimstone instead of floured sulphur.

Dr. Kimball: I never used the brimstone in sticks, I have used the sublimated.

COMMITTEE TO TEST FIGS.

The Chair appointed the following to consider the varieties of figs: W. W. Smith, Frank A. Kimball, and G. M. Gray.

The Secretary read the following letter from C. A. Wetmore, of Livermore:

LIVERMORE, CAL., November 20, 1888.

B. M. LELONG, *Esq., Secretary State Board of Horticulture:*

DEAR SIR: I send by express a branch of the so called (Redding) Picholine olive, from my orchard, near Livermore, to serve as illustration of general effects of girdling during time of bloom, and especially the development of summer growth just beneath the place of girdling. The time to girdle, if effect on the fruit is desired, is during bloom, just when the flower petals are turning brown and dropping. Some think a little earlier would be better, but my experience was otherwise.

I call your attention also to the wonderful vitality of the olive, which, when vigorous, will heal over the wound caused by girdling, if the operation is performed early enough in the season. I have girdled branches in July which are now healed over.

If a bud, according to the method I have explained to you, had been placed on the limb under the girdle last June, it is easy to see that it would have developed a good growth during the season, as you can observe the new growth which was forced out since that time.

I intend this year to make oil with my Picholines (?), and will report results for your information. I believe this variety is a fine oil olive, although there are many more desirable varieties.

Next year I shall have a good many bearing *Lucques* and *Amellaous*, budded on the Redding Picholine, besides single trees of the Rock collection.

My Mission olives are partly on a hillside and partly on a poorly drained magnesian flat; on the hillside they yielded eight gallons to the tree, on the flat very much less; trees six years old last spring. On poor land they are more fertile than the Picholine (Redding). The latter variety needs very good soil. For poor dry lands I would select the Rubra.

Very sincerely,

CHARLES A. WETMORE.

Here a recess was taken until one o'clock in the afternoon.

AFTERNOON SESSION.

DISCUSSION ON FRUIT DRYING (RESUMED).

[President Cooper in the chair.]

MR. GRAY: I would like to have one idea corrected that went out this morning, which was that apples could not be bleached without bad effect. I think that is a mistake; of course they can be very easily injured or ruined. They will take more sulphur than mankind can eat, but by bleaching they are much better; we sold all that we had at seven cents a pound, which was as much as we got for our best peaches, so that the apples can be bleached, and are very much better to use than those not bleached at all. We have been carrying our trays of dried fruit on a railroad track in cars this year, which we find to be very much better than the old way of carrying them back and forth, and saves a great deal of work in handling, running the cars directly into the depot with the fruit on, and we have a plank to walk on, instead of walking on the ground, because in this section we have a good deal of trouble with our dry ground becoming very dusty, and the more we can keep people off of the ground the less dust we will have. Instead of using a revolving duster like that which Mr. Smith speaks of, we have been using a wire table with about three eighths mesh, and the fruit is assorted into three sections on the

table; that is, making three grades as it is taken from the trees; and when the fruit is three or four inches deep on the table, a boy or two will rub it back and forth around the table, the dust going through; the fruit is then very easily scooped right into the sacks, which are hooked on the sides of this table, and it is sacked much easier than when it is cleaned with the cylinder, and dumped and shoveled up, although in that way they may get a little more dust out.

Mr. Smith: If the gentleman took me to say that apples could not be sulphured, he misunderstood me. What I intended to say was that the apple should not be sulphured as much as the other fruits; if you sulphur as much the sulphur will penetrate the apple and soon spoil it, but properly done you can benefit the apple as well as any other fruit. The pear you would sulphur, if anything, less than the apple; it will take less sulphur to show on it than any fruit I know of. In sulphuring fruit of any kind a person must know something of the strength of the sulphur he is using, for there is a great deal of difference in the strength of it; some sulphur that you buy is as strong again as others, and would not require more than half as much, but after burning it a few times you can readily tell and get an idea of about how much to use on any kind of fruit. A gentleman asked me if the reason the apple and pear take less sulphur is not because they are sliced thinner than other fruit. That may be so to a certain extent, but the flesh is porous and open and the sulphur enters more readily than with the peach or other fruit.

Mr. Gray: After covering the dried fruit with a sheet or sacking, I believe that the moths will find their way into the sacks, or even through some sacks. I think by having a tight room in which you are packing your fruit, and burning a little sulphur in that room, it will not affect the fruit and moths will not enter; you will be sure of keeping them out, while if you depend on throwing sacks over them they are bound to come in around the edges.

Mr. Wilcox: I had a ton of green pears subjected to the sulphuring process last year by way of experiment, and I found that after they had been sulphured and evaporated in an evaporator, that I could not eat them myself. I brought the matter before the State Horticultural Society last year, and Professor Hilgard has the matter under consideration now, as to whether so much sulphur is deleterious, and the matter will be reported upon pretty soon in that society. Experiments have been made in my county, where the most of the prunes are grown at the present time, with the Petite prune by sulphuring, and as I visited the fruit driers to study the matter, I was surprised at the effect of the sulphur. The sulphured Petite prune has the appearance of the Oregon Silver prune. The prunes were dipped in lye and put out immediately into the sulphuring box and then taken out of that to the field—it is an important matter not yet decided what we want of the prune—the prune which we want to develop; we want to produce all the prunes in this State that are used in the United States; we are spending millions of dollars annually to bring foreign products to this country, and are using an immense deal of it. We know we can raise a good prune, but some things we do not know yet. We do not know whether we want a black prune such as they bring from France; we are inclined to think that the Americans prefer the lighter colored prune; still some of our growers have sent their prunes to San Francisco this year and paid half a cent a pound to have them present the color and appearance of the French prunes. I am aware that those prunes are said to sell for higher prices, and it places us in rather an embarrassing position to determine what to do, to secure the best price for our fruit. Our prune

growers have learned one thing, not to pick the prunes from the trees, and they have learned not to pick them from the ground; they have learned that they can drive in between the trees with a sled or a little low truck with a sheet attached to the box, and shake them right into the box; that saves a vast expense. They are then carried to the shed where we assort them, placed on a platform, and then dipped in lye for about a minute, enough to crack the skin very slightly so as to make them dry out quickly; then they have two ways of putting them on the trays; one is to have a bucket, which Mr. Fleming has patented, the bottom of which drops right out and puts the fruit on the tray; the better way is to hang your pail like the old fashioned bucket, so as to distribute them handily; they should be dipped in lye which is boiling hot, and then dipped into cold water, and carried out on trucks into the field. This year I noticed where some driers have posts driven into the ground and temporary frames made where the trays are placed up from the ground; some think that they dry a little better that way, and then these trays are piled up every night, three or four high. The highest priced prunes we have ever grown in Santa Clara County have been treated in this way. They put glycerine on them, which is said to be the cheapest substance, or some coating of liquid sugar, or something, and some of our smallest were sold for the highest price, where they were put in tins, and labels on with the name of the ranch; I think some were sold for 20 cents a pound, and I was told by good authority that a man could sell a hundred carloads of that kind of prunes; I suppose on the same principle that Mr. Cooper sells his oil. It was suggested to me to-day not to dip prunes in lye at all, but after they were dried and shriveled up, to steam them a little if you want to bring out that full plump appearance of a prune, and make it look nice.

Mr. Hatch: There are several things in relation to fruit drying I would like to call attention to: first, in the last two years there has been more advance in fruit drying in California than had ever been made in all the days that are past, but yet we have improvements to make. I think Mr. Smith's remarks cover nearly the ground, and being by a man who has had a great deal of experience should have great weight, but I desire to refer to some things that have come to me in advance of the methods adopted by myself this year. I have shipped a little more than one hundred and ninety tons of dried fruit from my place; most of it was very good, but nearly all might have been better. First, the cutting of fruit could not have been better explained than by what Mr. Smith said; the fruit must be ripe to make good fruit after it is dry; now a good many of us in cutting peaches or apricots do not cut clear around the fruit with the knife. They cut part way and tear it open, as it is a little quicker; some do not go to that extent—they let the two halves cling together. To make a nice dried peach or apricot the knife should circle the whole of the peach and make it in two halves, lay each piece with the cup up, not, as many do, edgeways to get more on the tray. It not only spoils the shape of that piece of fruit, but you put that tray in the sulphur chest and the sulphur seems to start the juice, and you will find that that juice is very plentiful on the tray and in your sulphur chest; it is the juice of the fruit we wish to save, and if you lose it you lose weight and therefore profit. It costs a little more to do as I have suggested than when you put it on edge, but we save that in weight and in appearance of the fruit. As to sulphuring, some think that forty minutes or longer is too much; it cost me several thousand dollars to find out that ten or fifteen minutes was not nearly enough. I had been impressed with the idea that ten minutes at the outside was enough to bleach peaches or apricots, and I submitted them for ten minutes, and

sometimes as much as fifteen, aud then condemned the sulphur method as not being beneficial to me, from the fact that my fruit was not bleached; it would not retain its natural color, but showed oxidation. I said our "climate is not adapted to the drying of fruit." In Suisun Valley now we have no fog there, but there is moisture in the air which is observable upon the fruit in the morning; so I went down to the city to a young man named Morris, who had been drying at Winters, and who had made the best sun-dried fruit I had seen up to that time, and wanted him to come up and show the boys how to do the work; he says you are doing all right enough, only you do not sulphur them long enough. Now, as I have before said, it is immaterial to me what I have to do to fruit to make it sell at a profit—that is, within reason; I don't want to poison anybody, but if they want it painted green, yellow, or white, and will pay me better for putting up my fruit that way, that is the way I want to have it. Now, what shall we do—shall we send them fruit they do not want when we are able to make it as they do want it? There may be a certain degree of bleaching that would be deleterious: that question as to how much will not be harmful I hope will be solved, but until we do know that and until we can appreciate that we have harmed the health of any one, and while they will not pay but a small price for that that is not sulphured, I do not see what we have got to do but to bleach to their taste. As I said before, I bleached my Petite prunes this year till they were, or nearly a golden yellow, and they were sold at 10 cents a pound delivered in Chicago in fifty-pound boxes, which is a pretty good price this year. The last two years I had some Bartlett pears too small for shipping and cut them into quarters, removing a little bit of the blossom end of the fruit and a little bit of the stem end; I cut them into quarters with the seeds and cores, put them on trays and bleached them. Last year I got 14 cents a pound for them in fifty-pound boxes in Chicago, and this year 11 cents. This year the price on all of our dried fruit is lower than usual unless possibly as to raisins.

Mr. Block: Do you mean to say you did not peel the pears nor take out the cores?

Mr. Hatch: Neither one; in fact, as probably the ladies know, a pear is better baked in that way than in any other, because the skin and the core is there and gives a finer flavor in cooking. The dry pear with the skin and core is better than one with the seeds and core taken from it, but whether that is so or not they have paid more the last two years than they would if sliced, and peeled, and cored. I do not know why, unless it may be that they looked more like canned goods when they are cooked and put on a plate when the skin is yellow and the pear white. Referring to prunes; in the Granger's Bank in San Francisco I was shown by Mr. Montpellier some put up by Mr. George Hendy, whose place is, I believe, in Santa Clara County, between Los Gatos and Saratoga. They were simply magnificent goods in size and appearance, and we compared them with a box of the finest imported French prunes, and Mr. Montpellier, himself a Frenchman, who would be prejudiced, if at all, in favor of his country's goods, said that these were the finest goods of the two. They pursued a different plan from what I used, and endeavored to make it appear like the French goods, but he considered it the best fruit of the two; that shows we are making some progress.

Mr. Wilcox: Those prunes were processed in San Francisco.

Mr. Hatch: There is a house in San Francisco, I understand, that buys prunes and processes them, and I believe does so for others. There are different sized trays used. I use three by three, and make the chest to fit them. It don't matter what size they are as long as they fit into the chest,

to be submitted to the fumes of sulphur. The chest is just a box that will take these trays in and close, with a little room for the sulphur to go up the sides and ends. I believe in Santa Clara County they use trays six and eight feet long, and run them in on cars to the sulphur house, then close the doors at both ends; and when they have been in there sufficient time they run them out again. All these things depend upon the quantity of fruit you have to dry. Another thing we haven't said a word about drying, and that is grapes, such as you ordinarily sell for wine. In the Livermore Valley and other localities, the grape growers, rather than sell to the wine makers at the low prices, have dried their grapes. This year the prices varied, starting as low as 2½ cents in California, and run up to 3½. The bunches can be picked and laid on the ground and when dry taken up into boxes, and then rinsed in boiling hot water; that removes the dust and any insect's eggs that may have been deposited, and then laid out and dried.

A Delegate: Wouldn't that take the bloom off?

Mr. Hatch: No, only to a very limited extent. There is becoming quite a market for that fruit in the Eastern States; they use it for cooking mostly, instead of the cheap raisins and Zante currants, to which, as a rule, they are preferred; for Zante currants, as a general thing, are very dirty, and where they want to use some fruit in cooking they get a better article for their money, and these are much cheaper. In Europe they use them in large quantities for making wine; we have not got to shipping yet to Europe that I know of; there they use most of them to make wine of. The finest sample of dried fruit that I have seen this year, is made by Mr. J. L. Mosher —I think he is in Santa Clara County—said to be by a new process in some respects. It looked almost too good to eat. His plan I don't know. I hope it will be submitted to us at some time. Now in regard to the labor of fruit drying. Two years ago we thought there was nobody in the world that would cut fruit or dry it except Chinamen. In the last year or two there has been quite a change in that direction. In the Vaca Valley one day during this last season, a man who was largely engaged in fruit culture there told me "the labor problem is solved, for we can get white help, and the best kind of white help there is in any county—the women, the girls, and the boys." I do not speak now of boys, such as would be picked up in a city by hundreds, or any small quantity—there you can go and pick them out by one or two—for if you get a gang of boys from any city or large town together they have too much fun to do good work, but women, young ladies, and children, by just letting it be known that this kind of help was wanted, and they could get all they wanted. One of them would do the work of two Chinamen, getting twice the price, of course; that is right; do it by contract, so much for one hundred pounds, and it is remarkable how much good work some of those children will do. On my place this year, some young ladies, when they got their $2 worth of work done would quit and go home, but there was one little boy ten years old that worked there through the season; his average was a little rising of forty boxes—he got 20 cents a hundred—his largest work was fifty of those boxes, for which he received 20 cents a hundred, being something over $3 a day, and did it as well as any. We have but one other on the place, twenty-three years old, who did one day sixty of those boxes, or one ton of peaches, cut them, and put them on the table to dry. We have not now to go to the Chinese to do any of that kind of work; it is work that can be done neatly; they need not become dirty; their hands, of course, will become stained with the fruit, but you have a bucket of clean water for them to wash in, and it is wonderful how nice and neat those

ladies appear there when they are at that work. You go to some other places where the Chinamen are and you will think that the hogs had been there, and were there yet. I do not know about the picking of fruit, whether we have got past the Chinamen yet—I have not yet. I don't know whether I will get along without them in gathering my fruit, for I have been accustomed to have them for several years, and they understand how I want my work done. When we want the most help is right in harvest time, and then there is a great portion we only want for a few days. I don't know how we can do that—I hope some one will explain how we can get along without them. So far we have been much better pleased by the work done by whites than the others, so much so that we decided to try and get along without the Chinese next year in the handling and drying of fruit. I think Mr. Smith said we must discard peeling peaches with lye. That is true; not because you can't do it and do it well and make a beautiful fruit without any flavor of the lye whatever, but because so few have conveniences to do it that way, and, endeavoring to do it without the conveniences, spoil the fruit. The dried peaches, year before last, which we peeled, were beautiful and had the finest flavor of any dried peaches we have ever eaten. This year I did not have the same success; the reason was it was a dry year and the creek ran low, for I have always said that if you peel with lye you must have a river of water to rinse your fruit in, and never dip it in the same water. Except under those circumstances you cannot have them of good color and free from the taste of the lye, and without a great quantity of water you had better let the lye alone. As to packing, we, as a rule, invariably take the best fruit, sort it out from the pile, and face our fruit; well, that is all right, providing there is none under that is much inferior. This year, in sending samples, I sent a sample of what I would put on for the facing and a sample of the filling, with instructions to send samples that would be a little inferior to what it would be when put up. Well, the result was satisfactory—no rejections. I only had heard of one rejection of my fruit this year, and that was Sprague, Warner & Co., of Chicago, where there was an arbitration, and the three that it was left to decided unanimously that the fruit was not only as good but better than the sample, and that as the time was not specified, they would consider the time at which they had received them a reasonable time, as was specified in the contract from the agent through whom it was sent. In regard to evaporators, the experience all over the State is the same. While along the coast where there is much fog they must use them to dry the fruit and have it presentable, there are reasons why fruit dried in the sun is better than evaporated fruit, and one of them is that it has no chance to become scorched, and there has hardly been an evaporator made but sometimes scorches fruit.

MR. BOOTH: Have you ever seen fruit dried by the Acme, a steam drier?

MR. HATCH: I have never seen any fruit dried by it. You can get superheated steam hot enough to scorch anything. I had some of the Acme, the kind spoken of by Mr. Smith, but that has been discarded.

MR. BOOTH: I have some, made at Michigan, I have used for two years. We have had a good deal said by the producers and driers and so on; I would like to hear from the young man who has been in the other line of business—purchasing; I have reference to Mr. Varney.

MR. ELLWOOD VARNEY: I have had some experience, both in growing and in drying, but the gentlemen who have preceded me have covered very much of the ground which I would like to take up. I have no theory to agitate at all; I look at this matter from a dollar and cents point of view, and there are two or three points that perhaps have not been touched upon

as fully as they might have been. First, the gathering of the prune: the prunes cannot be picked from the tree, for the reason that you cannot find anybody that will pick it at the proper stage of ripeness; let the fruit that has fallen to the ground be raked away, and all the clods be raked away from the tree, then you have a comparatively smooth surface upon which to shake the prunes from the tree; shake the tree gently, not very hard, and all that falls to the ground without any stem attached are ripe enough to dry; any that come with the stem are not ripe enough, or else the tree has not had water enough. Mr. Wilcox has described how it is done in the Santa Clara Valley; there they are gathered into those wagons with sloping sides at a cost of 40 cents to four bits a ton at the outside; by shaking as I have described it will cost from $1 50 to $2 a ton, but to pick by hand, as some of the growers do, could not be done for less than $3, and probably would cost from there up to $10, and could not be done properly, for much of it would not be ripe enough—that is, the starch in the fruit would not be changed into sugar as it will be when properly ripened, and then some of it is too much dried, and when it is dried too much the skin becomes tough, and in the process of heating much of that starch and sugar will be changed to alcohol and gases, and the skin will burst, and when dried the pulp will adhere to the pit. The prunes when hauled in wagons to the place where they are dipped are generally put into a hopper that leads to the grader. There are generally four grades, and attached to this grader is a fan, all run by steam, that blows out the leaves, small sticks, etc., so that the fruit is perfectly clean and generally graded before it is dipped. As to bleaching, I do not believe it does half as much hurt as whisky. Now apricots should have at least thirty to forty-five minutes, and peaches forty-five to sixty; this is a minimum; apples from ten to twenty minutes, and by the way, apples should be spread very evenly upon the trays—wire trays or slat trays—if you expect to bleach them in ten minutes, and pears will dry pretty near white without it. Such light colored prunes as Mr. Hatch speaks of are not generally wanted; four or five years ago our light prunes were not wanted—those grown on the young trees, but California since then has been given a place, and now the California prune is wanted. Up to four or five years ago as many as possible were wanted, to be sold as French prunes, and unscrupulous dealers would use them in that way; now they will take them preferably a little light, but not bleached; that is what I find as a merchant in disposing of them; I have tried for two or three weeks to sell two or three tons of very light colored bleached prunes, and I have not been able to dispose of them yet; there is now a demand for very dark colored prunes; we have sold this year several carloads to one party, and I can tell the growers if they will come to me to know how to cure them, I can find a place for at least one thousand tons next year. You do not want to have the lye too strong, so as to cut the skin all to pieces; you want to have generally a good smooth surface, and then it will be more glossy than if it is cut very much with lye. The two parties in San José who have sold their prunes for such very high prices have been referred to. One gentleman made a mistake in saying that the small prunes made according to his process sold for as much as large ones; that is not so, and you will find that neither Dr. Hendy nor S. F. Leib sold any that run under eighty to the pound. Mr. Leib got for his prunes this year from 9 to 17 cents, delivered in New York. They are put up in tins, and it has cost him over $10,000 in the last three years to learn how to put up his prunes.

Mr. Wilcox: Last year Mr. Leib had his prunes on exhibition put up in ten-pound cans, and beautifully labeled and marked one hundred to the pound, and I believe that I said that these prunes sold on the principle of Mr. Cooper's oil, and that they could sell one hundred carloads of those prunes at 15 cents a pound.

Mr. Varney: I came up from San Francisco with Mr. Leib a few days ago and obtained a good deal of information from him, and I know that in a general way we are not able to compete with Mr. Leib or Dr. Hendy. Dr. Hendy's prunes are put up in boxes weighing four and one quarter pounds. He intended to have it five pounds, but the boxes were made a little too small. They are all carefully selected and carefully graded. Mr. Leib grades his into five grades; that is, they run from forty to forty-five to the pound, from forty-five to fifty, fifty to fifty-five, and so on down to seventy-five to eighty to the pound. They run strictly, and if you pick up any grade you will find that they weigh that exactly. Those prunes—thirty-five to forty—sold for 19 cents. And by the way, Mr. Leib's grader cost him $500. There is no one else has as perfect a grader as his. It might be gathered from the remarks made here that the best sun-dried fruit that can be made would be better than any evaporated fruit. That is not so, speaking from the dollar and cents point of view. If it could be just the right stage of ripeness it will make a far nicer fruit by being evaporated than it would by putting it in the sun, but there are very few who would take the pains or who could afford to do it. Still, from my experience as a merchant and drier, I say that evaporated fruit can be sold and does sell higher than anything in the sun-dried line.

Mr. George Husmann, of Napa: I would like to say a word on the subject of drying wine grapes. I take a great interest in that matter, because I see that in that way a large outlet for a grape of which we have too many; that is the Zinfandel. I think, if we could dry our grapes and dispose of them at anything like the prices mentioned, we would work up a large quantity which otherwise would have to be made into wine, and bring down the wine prices so much as to make it unremunerative; but this season there have been so many obstacles in the way of the weather with that grape, and perhaps on that account they have not been used so largely for that purpose as it would have been. We have had, as you are all aware, very hot weather, which caused the stem of that grape to dry, and consequently they have been very light and soft. They have said that the grapes that are to be dried ought to contain 25 per cent of sugar, which the Zinfandel did not reach. Another thing is the uneven ripening of that grape; we know that generally there are a good many dried berries on a bunch already when others are comparatively green and unripe, and they would hardly make a good dried fruit in that condition. For those reasons I think there have been but few grapes dried this season, especially as we had very heavy rains in September, which made it very difficult. It has been mentioned that they could be made into wine in Europe, or any other place, as is evidently true, as every one that is familiar with wine making knows that when grapes are dried, we simply dry out the water, while the sugar, the flavor which constitutes the grape, remains; consequently, if they are transported in their dried condition, and the water that has been dried out by the sun or by an evaporator is added again, and they are fermented with it, there is no reason why they should not make just as good wine as they should now, and therefore if we can find an outlet in that way, it is a very important thing for those who have grown the Zinfandel in such large quantities.

MARKETING CALIFORNIA FRESH FRUITS.

Essay by B. N. Rowley, San Francisco.

In California, under the influence of her glorious climate, men and matters move with a rush. Large interests vie with one another for supremacy, while important matters of detail are lost sight of or become obscured for the time, overshadowed, as it were, by the magnitude and grandeur of our vast undertakings. At present we are rushing headlong down that broad bower-covered avenue of "fruit culture," jostling against one another in our vain endeavor to reach the fruit grower's pinnacle of fame—"the greatest number of acres, the largest number of trees, and a record of producing the greatest quantity of fruit." The question of overproduction, which has been raised by some, might be profitably considered by all. Not that there is any danger from overproduction in the strict sense of that term, for we do not consider that fruit boxed and shipped from an orchard which has been allowed to care for itself should be classed or considered under our term "production." It is not of our production; it is simply an act of nature guided by the hand of Providence. There is no immediate danger of an overproduction of fine large fruit of choice varieties. We must admit that fruit growing as a business is moving forward with a rapid stride, and is fast outtraveling our facilities for distributing. One of the most important subjects for immediate consideration is that of greater distribution of our green fruits. Too many peaches, pears, apricots, plums, prunes, raisins, oranges, etc., of fine quality have never been grown, but faulty distribution allows these fruits every season to become a drug in certain markets, and to be disposed of at unprofitable prices to the grower. The question of a package of suitable size in which to retail our fresh fruits for table use should be considered. The present style of package is much too large for general use. Our fresh fruits should be sold by the package by the retail trade, and not by the pound. Packages should range in size, so that people of small means could buy an entire package for a modest sum. During the season just passed growers have received for their apricots from $1\frac{1}{2}$ to 2 cents per pound; the retail trade have sold the same three pounds for 25 cents, or $8\frac{1}{3}$ cents per pound, and if less than 25 cents worth was asked for at a time the tradesman would turn up his nose at the smallness of the order. With many 25 cents is more than they wish to invest in fruit to eat from the hand at any one time, and they do not care to take it home in a paper bag, which as a rule is wet through and bursts before they arrive. If you give the public a small desirable package you will greatly increase the consumption of fresh fruits. In the matter of packing, do it with next season in your mind. Do not face your packages with the only fine fruit they contain, but pack a fair, honest box or package. It does not pay to pack, ship, and pay freight on poor fruit, say nothing regarding the reputation of the packer. Why ship the bulk of our fresh fruit to San Francisco and Chicago, as has been the case this season? The islands of the Pacific, other portions of the East, and England afford an unlimited market with their hungry millions who are only waiting for a chance to buy California fruit. Hundreds of thousands of people have never had the pleasure of looking on California's luscious, golden product. We need better transportation facilities, and a much more elaborate and widespread system of distribution.

The following is an estimate of our green fruit shipments from all points of the State to the East for the season of 1888: Carloads, two thousand one hundred and eighty-four; packages, one million six hundred and sixteen thousand one hundred and sixty; pounds of fresh fruit, forty-three million six hundred and eighty-one thousand one hundred and eighty. The total amount of money paid the railroad companies for the transportation of this fruit, amounts to upwards of $840,840. This is a vast sum of money to pay for freight. It occurs to us that the railway companies can be induced to largely reduce this amount next season and still make money hauling green fruit.

New York City, the metropolis of America, with its suburban cities and towns, furnishes a fruit-eating population of over three millions of people. New York being the leading port of entry, the bulk of imported green fruits and dried fruits find their way into consumption through this vast commercial emporium. There were received at New York during the year 1887, seven hundred and eighty-five thousand seven hundred and forty-five boxes and cases of oranges from the Mediterranean, equivalent to seventy million one hundred and eighty thousand eight hundred and seventy-five pounds of fruit, or three thousand five hundred carloads; of lemons, one million three hundred and eighty-nine thousand three hundred and eighty-six boxes, representing one hundred and eleven million one hundred and fifty thousand eight hundred and eighty pounds, or five thousand five hundred and fifty-seven carloads; of bananas, two million four hundred and sixty-two thousand seven hundred and forty-seven bunches, representing about seventy-three million eight hundred and eighty-two thousand four hundred and ten pounds, or three thousand six hundred and ninety-four carloads; of pineapples, five million seventy-one thousand and ninety-four, equal to ten million one hundred and forty-two thousand one hundred and eighty-eight pounds, or five hundred and six carloads; of Almeria grapes, two hundred and fifteen thousand barrels, equal to thirteen million nine hundred and seventy-five thousand pounds, or six hundred and ninety-nine carloads. From Florida, about three hundred and fifty thousand boxes of oranges, thirty-one million five hundred thousand pounds, or one thousand five hundred and seventy-five carloads. From this it will be seen that the amount of green imported tropical and citrus fruits, not including California shipments, entering New York in a single season, is something enormous. Here we have a grand total of three hundred and ten million eight hundred and thirty-one thousand three hundred and fifty-three pounds of fruit, which would require fifteen thousand five hundred and forty cars to haul, and five million two hundred and ninety-seven thousand three hundred and ninety-six boxes, cases, and barrels in which to pack it. In addition to this, the amount of domestic, or home-grown green fruit consumed is very large. There are no statistics available as to quantity, but some idea may be gained from the fact that of peaches alone seventy carloads arrived at New York in a single day during the peach season. What a market this vast multitude of fruit eaters, who now draw their supplies from all parts of the globe, will furnish for California's fruits in the near future. This season a very small quantity was sent to New York. As near as we can learn, only one hundred and fifty-nine carloads, or two million seven hundred thousand pounds of fruit were shipped this season from California to supply the demands of upwards of three millions of people in and about New York City, say nothing of the State and interior towns. This is not a pound for each person. Is it to be wondered at that New York dealers clamored for more fruit from California? Some going so far as to refuse to purchase or deal in our fruit unless they could be assured of a

daily supply in place of one day a fair supply and then none for three or four days or a week. This style of business they claimed was ruinous to their trade—they want a fair daily supply through the season or none at all. The public must not run away with the idea that any kind of fruit will do to ship. The shipments of California fruits, which have found their way East this year, represent our largest, choicest, selected shipping varieties of apricots, peaches, pears, plums, prunes, cherries, nectarines, grapes, and quinces. Where are the "old fogy" fruit growers, that are eternally preaching overproduction? Why, such a thing is impossible provided you grow fine fruit. Of poor trash, the production is already much too great. You have not commenced to feed the millions with California's luscious fruits—what is twenty-one hundred carloads of fine, ripe fruit for the East with her fifty millions of people? Why, it is not a drop in the bucket.

DISCUSSION ON MARKETING OF FRUIT.

Mr. Block: Mr. President, I did not seek to present this matter at this time, and endeavored to procure others to do so; but inasmuch as we are talking about drying and preparing fruit for market, I want to present something that will bring it home to you: the question is, How much are we getting for our fruit? Can we afford to raise it at the prices that we do? And I will give you some figures, based upon this measure, of the largest shipping that has been done by any party in this State for this year, and that will be probably a basis to estimate how much we fruit growers are getting for our fruit, if we do ship it; to show who is getting the money and how much we are getting for our fruit. You probably have, most of you, seen the report here in the paper about three weeks ago, that the results of the California Fruit Union sales this year in the East would be about $420,000 or thereabouts for fifteen million of pounds. I have written to the "Fruit Grower," inquiring whether the amount they stated included the expense of packages, paper, packing, and loading; they said no. I made an application to other parties to get information as to how much we had been getting, and I find the figures $420,000 are not justified. We will not realize 2¼ cents a pound, paying our own expenses out of it; and our main expenses are boxes, paper, packing, and loading. You will probably be surprised if I tell you on a basis of eight hundred and fifty cars sold, carrying twelve million six hundred and two thousand one hundred and eighty pounds, sold gross for $773,117 06, out of which there was freight paid, amounting to $345,156 28; commissions paid, $77,298 06; cartage, $2,430; leaving as returns to the grower, $348,233 06; deduct therefrom crates, boxes, paper, packing, hauling, and loading expenses; take the average expense, and I am pretty near correct in saying 85 cents for one hundred pounds. So $107,118 53 goes off of that $348,233 06; consequently, out of these $773,117 06, the grower realizes for the twelve and a half million pounds and over of fruit, $241,114 53; this is net. The railroad realizes $345,156 28; the commission man, $77,298 06. To simplify the matter, the above statement shows that where the fruit grower realizes for growing, including cultivation, taxes, packing, and taking all the risk of shipping, $100, the railroad receives for carrying the same about $150. Now, this is a very important matter. The question with me is, can we afford to raise the fruit? Some of you gentlemen are selling fruit to the shipper, and you say, "I don't care, I am going to sell to the shipper." But the shipper that buys your fruit has these expenses; can he afford to

Note.—The above figures are modified from the report of the Secretary of the California Fruit Union.

pay these expenses and keep paying you the prices that he is paying? I have seen a statement made in print lately that California grapes have been selling in the East at $200 a ton. Now, I have a statement of the very highest price that grapes sold for, and that is nothing of the kind. It has also been stated that the railroad charges $30. The truth is that the railroad charges $75 a ton, and I stake my reputation on the assertion and challenge any one to dispute it, that to average all the fruit sent East this year the shipper has not realized $10 a ton for his fruit, net. Now, shall we allow ourselves to be fooled by parties who come in here and tell us we are getting rich?

MR. HATCH: I desire to mention that grapes sold for $200 a ton referred to the retail rates.

MR. BLOCK: I have been a shipper of grapes, and have received some of the highest prices and some of the lowest; and I tell you that I hardly realized a cent out of grapes, and they were as fine as any we have had. People are employed to give us information. We are tickled; we are pleased to hear that we are doing well; that we are growing rich; we laugh to hear it; but when we come home to pay our taxes, and to pay our help, we sometimes have to hunt around to see where we can get the wherewith to do it. I have shown you that the railroad company is getting $246 to your $100, and I could show you more, only I don't want to go so far into detail. For years I am taxed to pay the railroad debt upon $300,000 that my county has donated the railroad, and we have to pay every year the interest and a part of a sinking fund towards it, and in the State we do the same thing. Now, gentleman, I suggest that a committee be appointed by this body to investigate the matter that I have stated here; to go to the California Fruit Union and tell them to give you exact returns as soon as they can make them out, of the fruit shipped; to investigate this statement, and ask the Board of Trade in every city in the State to coöperate with you and compel the railroad to meet us and give us a living rate; we are all interested; in the whole community there is not a member that is not interested with us in our work.

MR. W. H. AIKEN, of Wrights: To bring this matter in its proper form before this body, I move that a committee of five be appointed by the Chair, to act in connection with a like committee to be appointed by the Fruit Union, to wait upon the railroad authorities and obtain better rates for eastern shipping. Such committee to report to the annual meeting of the Fruit Union and also to the spring session of this convention the results of their effort.

MR. BLOCK: I second the motion; however, the State Board of Trade is doing a great work, and I will amend by asking their coöperation and that of every Chamber of Commerce in this State.

MR. AIKEN: I will accept that, for the committee to coöperate with committees appointed from any other body.

GENERAL CHIPMAN: Mr. Block has left rather an alarming impression of the nature of the profitableness of fruit shipping. Now I took a little trouble to try to see the effect of the figures that he has, but did not perhaps have time to discover the ultimate result of his figures, but I want to call the attention of the convention to this fact that I mentioned in my paper last night, that the results of these shipments of the Fruit Union are now known. The table I presented is not challenged, gives all the items of cost, and you can take the net weight of the fruit, some eleven million of pounds, and with that you can find the exact cost per pound of every item that enters into it and find out whether Mr. Block is correct. From that table you get ultimately the result I stated, that is net to the grower from the

time they are turned over to the Union at $2\frac{8}{10}$ cents per pound. It is explained in the "Fruit Grower," from which I took that table, that from that net profit must be deducted the cost of cultivation, picking, and delivering to the Union. I consulted with some of the best informed members of this convention before I formulated last night the profitableness of growing fruit on that basis of $2\frac{8}{10}$ cents, on the assumption of one hundred and fifty pounds to the tree or fifteen thousand per acre, and while Mr. Block was speaking I have made another estimate on another basis, and on the experience of so well informed a man as Mr. Hatch. Taking the $2\frac{8}{10}$ cents per pound as the result to you of all the classes of fruit that went to the Fruit Union and that embraced everything except raisins and oranges, your deciduous fruits, and it is the best data I think obtainable to-day from which to generalize upon the fruit grown in this State. You take that $2\frac{8}{10}$ cents and let any gentleman in this room figure on it, he will find the result to him net over 1 cent a pound over and above all cost to him. Anybody who wants anything better than that must go into some other business. That on the basis of fifteen thousand pounds per acre, $150 net, and that that is the result of last year there is no gainsay.

Mr. Block: Are you aware that this year's returns will be 60 cents a hundred less than last year?

General Chipman: The "California Fruit Grower" states that from the best computation they can make of the results of this year it will be about $2\frac{1}{4}$ cents net to the fruit grower. Now they told me they could not give me the total results, but they gave me the average, and a large number of shipments with the highest results and the like number with the lowest results; some of them went as high as $1,400 to the car realized to the shipper; others resulted in loss, some $100, and some $50 to the car, but in order to get at this question you must deal with the whole, and you will find the statement of it in the "California Fruit Grower" of November tenth.

Mr. Hatch: I would like to say as to the expenditures of the Fruit Union this year, that the commission has been 10 per cent, which is at least twice as much as is necessary, and that is one thing we want to regulate at our next annual meeting. We could sell our goods by the same auctioneer we had this year at $2\frac{1}{2}$ per cent, and we can get an efficient broker, or agent as we call him, there, who will handle our goods to better advantage undoubtedly than we have ever had them handled for our benefit, for from 1 to $1\frac{1}{2}$ per cent, and 1 per cent is more than is needed to carry on the Fruit Union at this end of the line; so that will make a reduction of 50 per cent at least the coming year. In regard to the price derived from the fruit shipped to the Union this year, I don't speak from figures, but from what I have been informed in regard to the grapes this year, that almost without exception they arrived in bad condition. Mr. Weinstock showed me several letters in response from inquiries he had made from the parties who had purchased the grapes at auction in Chicago, as to the reason of the low price at which they were sold, stating that it was on account of the bad condition of the goods. We know that there was a hot spell that hurt our grapes, and that there was a rain that came upon them at one time, and to those causes are to be attributed the bad condition of the fruit.

Mr. Hutchinson: I would like to ask what percentage of fruit raised is fit to be shipped East?

Mr. Hatch: In those localities where they make a specialty of raising peaches for eastern shipment they can raise them all fit to ship, because they will not leave one on the tree until maturity that is not fit to be shipped. In other words, Mr. Smith will tell you that in Vaca Valley, where

they are raising peaches to ship, they raise them the size they want them, and the shape almost that they want for eastern shipment. It is almost a literal fact that they raise them to the size they want them by thinning and picking; but the proportion that is raised that is fit to ship in California is about this year in peaches as one pound in ten—not larger, positively, than that.

The motion of Mr. Aiken for appointment of committee was put and carried.

CALIFORNIA FRUIT SENT OVERLAND.

GENERAL CHIPMAN: I have here the table prepared by the "San Francisco Bulletin," published in that paper November seventeenth, as follows:

The first shipment of this season's pack of California raisins overland went forward in September, consisting of eight hundred and ninety-five thousand four hundred and ten pounds from Sacramento, and one million three hundred and forty-nine thousand one hundred and sixty pounds from Los Angeles. In October there were further shipments of four million and ninety-five thousand two hundred and twenty pounds from Sacramento, two million one hundred and seventy-nine thousand nine hundred and seventy pounds from Los Angeles, two hundred and seventy-one thousand eight hundred and forty pounds from Colton, and twenty-six thousand five hundred and thirty pounds from San Francisco. Thus, in sixty days, eight million eight hundred and eighteen thousand one hundred and thirty pounds new crop California raisins went overland, equal to about four hundred and forty thousand boxes. The shipments this month will also be large, a considerable quantity having already gone forward. We are also shipping large quantities of dried fruit, the shipments last month having been five million eight hundred and one thousand five hundred and thirty pounds from all points in California, against a little over five million pounds in September. There were also several carloads of ripe fruit forwarded last month, consisting chiefly of grapes. Next month shipments of California oranges will be in order. There is a fair overland business in California canned goods, with good shipments last month from this city and several interior points. The total shipments of California fruit in all its forms overland for the first ten months of the year were as follows:

FRUIT SHIPMENTS.

FROM.	Canned Goods—Pounds.	Dried Fruit—Pounds.	Ripe Fruit—Pounds.	Raisins—Pounds.
San Francisco	20,165,720	2,079,870	21,500	485,750
Oakland	727,210	20,250	111,630	----------
Los Angeles	162,150	1,248,910	9,763,530	4,049,660
Colton	291,920	721,860	4,784,920	573,540
Sacramento	2,297,090	4,110,360	31,799,680	5,876,270
San José	7,910,640	5,179,200	5,024,490	----------
Stockton	----------	152,150	408,600	140,450
Marysville	1,697,210	1,277,560	143,000	----------
Totals	33,251,940	14,790,160	52,057,350	11,125,670
In 1887	45,120,900	13,577,100	49,729,800	5,759,200

Sacramento shows up well in the above table as the most important shipping center for ripe fruit in the State. At least 60 per cent of all these shipments went out from that city, together with over 50 per cent of the raisins and 30 per cent of the dried fruit. The proportions shipped out of the State are a good indication of the proportions raised in the different sections. San Francisco, of course, has two thirds of the canned goods trade, without contributing any of the fruit. The central and northern counties are heavy fruit producers.

There will be seen from that, Mr. President, that nearly the entire shipment of deciduous fruits are made from northern California, that is one of the significant facts; and the second significant fact is the large amount,

particularly, of ripe fruit shipments that go forward from Sacramento. That has become the center of shipments of that fruit.

MR. HATCH: I would like to say that the prices obtained for fruit shipped East this year were larger than they have been during the life of the Fruit Union, with the exception of grapes and some varieties of plums; except some shipments of grapes, which were made two years ago from Santa Clara or Santa Cruz County, which brought the man in debt several thousand dollars on the shipment of six or seven cars. I think that was the worst shipment ever made out of the State, but in most all cases where our fruits have sold poorly in the East, it was on account of the bad condition in which they arrived there.

MR. BUTLER: I think the Fruit Union has done a great thing for this State, but their work is only in its infancy. One thing introduced by them is the selling of fruits at auction, which is the method by which the Algeria grapes and all Mediterranean fruits are sold. They first started to sell as we have sold our grapes, but afterward all concentrated, and since then all their fruits have been disposed of by auction, and as Mr. Hatch says, "My experience with the California Fruit Union this year is, that the general prices realized have been better than ever before."

MR. HATCH: And I will answer that one reason for that was the better service of the railroad company in getting them there on time.

MR. BUTLER: That is one of the most important points in this matter, having the fruit go on stated time. The managers of the Fruit Union have agents at different points and cities where fruit is to be sold, who are notified when the shipment is made to them, giving them a full description of the fruit in that train, and these agents, anticipating the arrival of the train, distribute catalogues to every buyer announcing that the train started at a certain time and will arrive at such an hour and minute as the passenger train is announced to arrive, and the buyers come expecting to buy on that information. Now, then, if that train comes on exact time those people are there and that carload is sold in a few minutes, and at a certain price, for cash, as soon as it passes into the hands of these dealers; the fruit is there and they vie with each other selling that fruit at the best price and in the least possible time, and now the profits accrue to the one that raises the fruit. It is now said that no fruit dealer in the East can afford to be without California fruit. The necessity of the grower for producing only the best fruits is apparent, because we pay as much freight on account of poor fruit as on good, and we should require, if it is possible, to have the railroad company take our fruit to the East on schedule time, so that people can positively depend upon having the fruit there for sale at the time advertised, and it will be an easy thing to sell our fruit. We could raise ten times as much as we have now and distribute it all over the East, in my opinion, having these years of experience, and find it easier to dispose of that amount than it has been to sell what we have had in the past. I have had recent letters from a gentleman who has passed ten years of his life in the East Indies, and also in London, and he thinks we have an opening there in which we can dispose of our fruit. It is well known that Crosse & Blackwell are the largest dealers in canned and preserved fruits in the world; their reputation as a first class house is unequaled—you have heard what Mr. Lubin said about the canned fruit that they sold—now it is said by this gentleman that Crosse & Blackwell find their greatest market in the East Indies; now let us find the goods that they dispose of in the East Indies, it can be sent direct from here in a systematic manner, and when we get the reputation that the quality of our fruit is as good as Crosse & Blackwell's we can certainly compete with them

because we put up our goods so much cheaper. There is an immense outlet in that direction.

MR. HATCH: There is an organization in San Francisco called the California Dried Fruit Association; the origin of it was from the fact that many producers of dried fruit were consigning to whoever attracted their attention as one who would sell for them to advantage, and therefore the goods were put in the hands of a great many who were without large experience, and the fact that there being a great many having the fruit as brokers to dispose of, worked to the disadvantage of the producer—those different agents receiving the goods, each striving to do his best with them, and, of course, the purchasers accepted the situation, and where they found many men with the same class of goods to sell, would go from one house to the other getting the price, which would result in shading the prices, and some of us thought it was best to unite our fruits in the hands of some agent that we ourselves would select, and aggregate them there, aud thus prevent our own fruit from competing against itself. The organization was formed late, too late, as some think, and yet there have been a good many cars shipped by that organization. Most of the sales are yet to be heard from, and it really matters little what the success of the drying this season may prove, but it was, without doubt, a method by which we may aggregate our fruits and place them in the central markets East, and dispose of them to the best advantage. The Fruit Union, in its first start, did poor work, and the methods now used by it may be much improved—so with this. Our action in this may be very crude now, but we hope that the producers of fruit will unite themselves together, and with their advice, and suggestions, and their fruit may be made one of the strongest means of disposing of our property, and that we intend to make it.

MR. JOHNSTON: As to what General Chipman has said about fruit, it is correct, and he has not told a half; but as to what he has said about wheat, I think he is laboring under a slight misapprehension, because I think there is plenty of land in California yet that is not adapted to fruit growing, and that *is* to wheat growing, and can be made profitable in wheat growing. I do not intend to discuss the question as to whether lands which are profitable to fruit should be devoted to that or not, for I think that there could be no question about that.

MR. CHIPMAN: I think that in five minutes we can get on the same platform. I have the utmost admiration for the wonderful products of this State, and I was very careful to say that there was nothing which could displace wheat here, but that we should take into consideration certain things connected with it: one, that where land is equally adapted to fruit growing, it is folly to go on raising wheat and make $5 or $10 an acre, where you could make $100 on fruit; besides that, wheat growing excludes population, and fruit growing invites it, for, necessarily, fruit growing increases your population, increases your home demand, and decreases that very large per cent which must go abroad for a market. I believe the time will come when wheat growing will be very profitable in this State, but it will be when we have four or five millions of people here, when we can support them, and then the twenty-five millions of bushels which we now export to Great Britain will be needed for home consumption. The observations of the Commissioners of Agriculture for a period of fifteen years, with the best data that they have been able to obtain from all over the globe, has reduced the consumption of the human family down to four and two thirds bushels per capita, in the United States, of wheat; so with those figures in mind, we can see what population we need here to find a demand for all of our wheat. I do not desire to be understood as attack-

ing wheat; I say a man who can grow wheat with favorable and satisfactory results, had better stay at the business; it is folly to change a business that is satisfactory and profitable, but there is a large area of land grown to wheat in this State that is not profitable, and the average shows that it must be so. The fact is that our wheat only averages about $8 53 per acre throughout this State, and I do not believe that wheat, on an average, can be produced and marketed for less that $7 50 per acre. I know, in these large ranches with the combined harvesters, it may be produced for much less. President Stickney, of St. Paul, gives the cost of growing wheat in the Northwest at $6 an acre, and the evidence in the case I have referred to, of men of large experience, put the cost of raising wheat at $7 50; so that the best results that we can get of wheat culture, on an average, is a very small profit per acre, and all I say about it is that when you have land, such as there is right around this town, worth $200 per acre, you ought not to keep population out, or keep these great plains sparsely settled when it will bring large prices; and if a man don't want to go into the fruit growing business, let him collect his interest, and he will get better results than he would from wheat growing.

Now about the market: The careful students of to-day cannot but feel a certain degree of concern about the surplus now grown in the United States. The surplus of the whole United States is 27 per cent; of the wheat grown on this coast it is 72 per cent. And we must find a market by shipping around the Horn for 72 per cent of our wheat; and if we here could retire some of our wheat land and devote it to something more profitable, we would help the eastern men who are struggling with wheat and cannot produce apricots, and we would be more independent, and put ourselves in relations to the conditions that surround us; and it seems to me the greatest folly for men to persist in raising wheat where the thermometer is 60 degrees below zero when we have this glorious climate. There is no estimate in money that we can make to compare with our climate, and that is the point I am driving at, and not to drive people out of the wheat culture, for I am thoroughly impressed with the great advantage that we have here in this State by reason of our climate, which we have never given sufficient economic value to, and I want our people's attention centered upon it; I want them to be made alive to the question, that there is something besides wheat growing that we must do; we must take advantage of this great climate that we have which is the source of our great wealth. People are coming in here by thousands to enjoy, not the privilege of growing wheat—they could do that in Dakota—they come to enjoy our glorious climate, and to raise the fruit of the earth which cannot be raised in other regions.

Mr. Johnston: With the explanation that General Chipman has made in his paper it will be entirely satisfactory to me. It is not that I object to the statement of the profitableness of raising fruit on lands that were adapted to fruit, but it was as to lands, of which we have hundreds of thousands of acres, that are not well adapted to fruit; and I want to say here, Mr. President, that we are noted in the Eastern States largely on account of the wheat products of California. Within a very few years we were more noted for wheat than we were for fruit, and ten years ago there would be more questions asked by a person who desired to come to the Pacific Coast about wheat than about fruit. Latterly the fruit question has absorbed all the curiosity nearly of those who desire to come to California, and has left the wheat question to one side. The figures that the gentleman gives as far as Dakota is concerned, are not applicable to our farms in California, neither are the figures of Mr. Cone and the other gen-

tleman whom he named. The climate, in the first place, in Dakota, and the manner of their farming, is so different from ours, that the expense is very great there, and on these large ranches of California the waste is more than the profits upon a Dakota farm. These are not economical farmers on these large ranches; for instance, this large ranch we have heard so much about is not farmed economically. Such large bodies of land cannot be farmed economically by one individual, they must be subdivided in order to get the best results. Take a farm of one thousand acres where the owner is the superintendent, he can put his wheat in the sack for $5 an acre; I know that from personal experience, though I have no doubt that it does cost those large ranches $7 an acre. I know it can be done on a reasonable farm for less money, and that we have hundreds and thousands of acres of that kind of land that is not adapted to fruit. That is the only question that I had to raise against this paper read by my friend, General Chipman, because it is a paper that is very valuable going into our reports, and I indorse it heartily.

Mr. George Husmann: A few words in regard to a point made in that paper, and that is the proper acknowledgment that was made to the Department of Agriculture for its strenuous efforts during the last administration to forward the interests of horticulture. We know that during the administration of the present Commissioner of Agriculture, Norman J. Coleman, there have been larger strides made in that direction, than during all the time that his predecessors were in office. He has created that division of pomology, the first time that it was ever acknowledged by the departments, and has spent nearly all of his administration in strenuous efforts to thoroughly reorganize and remodel that department, until it is now in good working order. But what are the means at his command? Last summer he was compelled to suspend his statistical agents scattered through all the States of the Union for one month, because the appropriation for them was expended, and at the same time when President Cleveland comes out he does not know what to do with the public money. If a little of that surplus now in the Treasury of the United States were expended for the benefit of the farming community through the Department of Agriculture, enabling these men to do what ought to be done for the farmers, it would be of incalculable benefit to us.

Mr. Johnston: There is an organization known as the Order of Patrons of Husbandry, and they have been knocking at the door of the Cabinet at Washington for twenty-one years. They have been admitted to the outer court, and on the fourth day of March next we expect a gentleman to enter there with a portfolio as Secretary of Agriculture, where we will be recognized throughout the world as a body of industrious people.

General Chipman: The Department of Agriculture as we know it took its origin as late as 1862, and when old Sir Isaac Newton, as we used to call him there, a great ponderous barnacle, as everybody considered him, went into his little cubby-hole down in the bottom of the Interior Department and began to run the Department of Agriculture, he was the butt of Congress and all Washington, and when he began to issue his agricultural report without binding, it became wrapping paper for most of the grocery packages around town. Now who was to blame? The farmers themselves. They go right along without seeking to gain their political rights. This situation induces me to offer this resolution:

Resolved, That a committee of three be appointed to draft a suitable petition to be sent forward to Washington, requesting that in the organization of the new Department of Agriculture the Department of Pomology shall be duly recognized and provided for.

Carried.

REPORT OF COMMITTEE ON FIG EXAMINATION.

Mr. W. W. Smith, of the committee appointed to report and examine on the fig, presented the following report:

We would say, in making our report on the figs, that we examined the specimens of the three varieties very carefully by putting each under the test of the microscope, by tasting them, and by tearing the skin apart and examining thoroughly the seeds, and we agreed to report as follows: Taking 100 as a standard of excellence, we give the fig grown at Penryn by Mr. Parker 100; the White Adriatic 75, and the imported Smyrna 50. We make the White Adriatic 75 because it was superior in flavor to the imported Smyrna, although the skin was thicker. That is about all the report we make. We think there should be another committee appointed to investigate further, as all we could do was to reach this conclusion from the three specimens of fruit before us.

Mr. Johnston: I move that the report be accepted, and the committee continued in office until they shall be able to make a final report.

Carried.

Here a recess was taken until the following morning at nine o'clock.

THE BANQUET.

During the meeting in the afternoon, every visitor was supplied with tickets for the banquet to be held in the evening.

Plates were laid on five long tables the length of the hall, and seats enough provided for one thousand people. The visitors were taken in carriages to the main entrance and were escorted into the hall by many ladies and gentlemen of the various committees of citizens of that place. At the head of the hall a table was especially provided for those who were to respond to toasts. After the eating programme was finished, President E. T. Reynolds called the members to order, and in a neat speech, in his very witty way, on many of the visitors names, announced the first toast of the evening, "Our Guests," by Major T. H. Batchelder, who spoke in a very hearty vein. The next toast was that by Hon. S. J. Stabler, of Yuba City, 'Fruit Growers' Conventions and Their Utility." The Judge responded, in an earnest, practical manner, and was much applauded. General M. G. Vallejo, of Sonoma, was next called to respond to the toast, "Our Glorious Golden State," which was the signal for a perfect uproar and applause. At the conclusion the General was literally pelted with bouquets, and a laurel wreath hung around his neck. The General proposed three cheers to California, Governor Waterman, and General Bidwell of Chico, which were responded to with a will, and followed by the same compliment to the General. The Chairman then introduced General N. P. Chipman, of Red Bluff, who responded to the toast, "The Press." "Horticulture and its Progress" was set opposite the name of President Ellwood Cooper, but he being unable to be present, Colonel L. F. Moulton, of Colusa, responded to the above toast in a pleasing manner, and was most heartily applauded. To Hon. William Johnston fell the toast "The Ladies," and indeed it was most gallantly done by the Senator. Mr. A. T. Hatch was next called to respond to the toast, "State and County Boards of Trade." His arguments were most interesting and enlightening as to the work of these Boards. Rev. T. H. Woodward, of Chico, then responded, with many witty remarks, in a five-minutes speech on "Chico and its Surroundings." "The Bar," announced the toast-master, and Hon. W. H. Aiken, of Wrights, from the beginning to the close of his remarks, kept those around the table in one continuous roar of merriment and applause. The gentleman's fun in describing many incidents, especially one referring to Colonel Moulton, of Colusa, seemed

endless, and all regretted when he sat down. "Southern California" was responded to by Mr. Frank A. Kimball, of National City. His remarks were terse, logical, and to the point. Hon. A. P. Hall, of Penryn, answered the toast, "Fruit Interests in the Sacramento Valley." The gentleman is a ready and eloquent speaker, and paid a splendid compliment to Chico, which was well received. "The Future of Insect Pests," announced President Reynolds, and J. D. Sproul smilingly bowed his acknowledgment. For a few seconds the audience held Sproul, and then, putting forth his eloquence into his speech, Sproul held the audience for ten minutes, with one of his incomparable subjects, which are filled with blithe and sparkling jokes and sayings. "Northern California" fell to Dr. Edwin Kimball, of Haywards. The doctor was fully at home with the theme, and presented in glowing colors the future of this magnificent section of the State. P. W. Butler, of Penryn, was the next speaker, and responded to the toast, "Our State Board of Horticulture." The closing speech was made by the venerable N. R. Peck, of Penryn, who made many happy hits during his address.

At 11:30 o'clock the orchestra played "Home, Sweet Home," and the banquet was ended.

Most of us were unable to do justice to the many rare viands and luscious fruits of all kinds laid before us, for we had but a few minutes before returned from another banquet tendered us by that generous host, Mr. F. C. Lusk, of that place, at his residence. Indeed, those were rare treats, and events that will ever remain fresh in the minds of those whose good fortune it was to be present. We were most hospitably entertained, and parted, ever regretting that we could not prolong our stay.

FOURTH DAY'S PROCEEDINGS.

CHICO, November 23, 1888.

TRANSPORTATION AND RAILROAD RATES.

The President announced the appointment of the following Committee on Railroad Rates: Hon. W. H. Aiken, of Wrights; Hon. L. W. Buck, of Vacaville; Mr. Eugene Germain, of Los Angeles; Dr. Edwin Kimball, of Haywards; and Mr. P. E. Platt, of Sacramento.

A communication was read from the San José Grange concerning the proper mode of assessing property.

LAWS ON EXTERMINATION OF INSECT PESTS AND TAXATION OF ORCHARDS.

HON. S. J. STABLER, Yuba City: I have a few suggestions to make in regard to the first part of this title. I have, during the season, on several occasions considered the matter of the law on insect pests now on our statute books, and on yesterday, during the noon recess, I made some examinations, and am surprised at what I find. It is the opinion of many people that we have not enough laws on the subject, and that they are not sufficiently stringent; that they cannot be utilized and enforced. Now, from my examinations, I am convinced that we have too much law on the subject. Unfortunately, the first laws embracing the subject were rather crudely prepared, and, I am informed, that in the Legislature they were unduly tampered with; that there were too many persons with one idea who wanted alterations or amendments. I find, on examination, that we have a plain, speedy, and adequate remedy under the County Government Bill. It seems to be perfect, but it will not be perfect if the fruit growers of the State merely ask for the enactment of an ordinance and sit in their easy chairs and give it no attention themselves. Now, some years ago, prior to the change of the Constitution of this State, the Boards of Supervisors of the respective counties of this State were very inferior tribunals; by the change of the law they were given complete and supreme jurisdiction over very many subjects enumerated in the County Government Act, to the extent of thirty or sixty. Among other things the Constitution says: "Any county may make, and enforce within its limits, all such local police, sanitary, and other regulations as are not in conflict with general laws."

Section 25, Article 28, of the statute of 1883, in the County Government Bill—"To make regulations for the destruction of gophers, squirrels, other wild animals, and noxious weeds, and insects injurious to fruit trees or vines or vegetables, or the pear blight." Now, the statutes being so positive and peremptory that jurisdiction goes as to these different subject-matters—this is as sweeping, well-worded a little section as I almost ever saw, to be applicable in this case. The reason I say there are too many laws is this, and it is the only question in my judgment that can be made

as to the effectiveness of this statute; the Constitution also says that these laws must not conflict with any general statute law; now, it may be that the existing laws that we now have will have to be repealed to some extent or so far as they cover this question; the machinery of the present statute seemed to be sufficient, they are inchoate, they are crude; to illustrate, where the power is given to the Supervisors of the county to appoint a local commissioner or a local fruit inspector or some such office, it compels him to inspect orchards and to notify the owners to exterminate within a certain time these insects, or to commence to do it, or to cleanse them in some way, and then it provides for him a small compensation, and makes the compensation and the cost of the extermination, if the party does not do it, a lien on the land, and makes him engage in a quite important lawsuit to get his little fee. At all events, in that respect and in many others it is entirely impracticable unless the fruit growers, or unless some man or body of men will take hold of it and tend to it and work out the fruit interest. Now, it is utterly impossible for any headway to be made against insects and pests by the orchardists of this State unless the fruit growers themselves take the matter in hand and work up and attend to it as one of the most important things in their business—it can be of no value in any event or with any law. Now, if the fruit growers of the State, of the county, or where the counties are large, of portions of counties, or districts, will get together and organize and have regular meetings and every man attend to his interests and every man be willing to put his hands into his pockets and take out some money to carry on this thing, there will be no trouble about it and it can be done.

I have been told that in several counties (Santa Clara for one), a committee of fruit growers would go before the Supervisors and ask for the appointment of an officer, and they would be told that no other interest had ever asked for such extraordinary aid from the county, and that they did not feel disposed to grant it. Now, I am not surprised at that, but I say that under the new Constitution, these ordinances can be passed and have been passed, for it embraces sanitary measures and everything of a police and local nature; and also the imposing of high or low license on the liquor traffic; and in different shapes it has been taken to the Supreme Court, and in every instance where the issue was fairly made, it is held to be perfectly constitutional and valid. It was tried a short time ago, where the Supervisors, by ordinance, levied a special tax on sheep grazing, independent of and in addition to the ordinary ad valorem tax; there was one case where it was imposed to cover a certain sum on local sheep owned by residents of the county and on sheep driven from other counties. That was held to be bad, but in some other county the issue was fairly made, and it was held to be valid.

Of course, as you know, it has been tried many times as to the validity of the ordinance for high license, and in every case it has been upheld, but as I have said, we should not depend upon the law entirely; we should raise in every fruit-growing section a sufficient sum of money, employ the best legal talent, and have a first class ordinance drawn, and when once drawn with a great deal of care it can be in a great measure copied throughout the State, and I have no question but that it will be perfectly effectual. What we want is a concise and clean-cut bill. We can't find it in the general statutes; we cannot go to the Legislature and secure it in a short session of sixty days. We want a bill without any circumlocution, and when it is made we want the moral support of the fruit growers themselves, so that when the ordinance is passed and the appointment is made, and the mode of exterminating insects is outlined, to go before the Board

themselves and represent it and stay with it, and to go with the Commissioner, and it is of the greatest importance to put up their money from their pockets, for we can't get good work done without it is paid for. There will be no great expense, for the contest made over this class of laws in the liquor ordinance was closely contested, and enables us to know that the laws are good. So much for the mode. I am not prepared to say as to whether there will be a conflict between these ordinances and the present existing laws. I believe there will be, and it may become necessary to take some action to know whether they are to be repealed or not.

Mr. Wilcox: I was one of the committee to visit our Board of Supervisors in regard to this matter, and finally after consulting with what we regarded the best authority in the State, Judges Belden and Spencer, our Superior Judges of Santa Clara County, against whose decision the Supreme Court has seldom held, they gave us under that application $500—one hundred dollars a month for a Commissioner, at the same time it was decided by them that there were laws in the State to allow a general tax. So far as that is concerned, the question was settled with us, and we have an appropriation of the Supervisors annually for five or six months. So far as our county is concerned, our impression is that the appropriation should be doubled for carrying on this department. I agree with Judge Stabler that we should have laws beforehand so that when we go to the Legislature they will have time to act upon it. While I am on the floor let me say something in regard to the instructions of the San José Grange. They believe that trees and vines should be taxed as part of the property. They believe so for this reason: the Assessor goes around and taxes trees according to the number, and he might just as well tax your orchard by the number of acres, for if the Assessor does his duty he examines the property and gives his judgment on it as to what it is worth. If this meeting should indorse their resolution on this proposition and have it go before the Legislature, it would please a large number of voters in my section of the country.

Hon. W. H. Aiken: This is a very important question, and I am glad to hear Mr. Stabler so fully upon the subject. I have not of late examined the law, though I have previously done so, and my impression is with Judge Stabler that the law referred to should be repealed. It is an absolute dead letter in this State, and it is not well to have laws on the statute books that are not enforced. The constitutional provision referred to, and the authority of the Board of Supervisors to make laws and ordinances, has been held entirely sufficient, and it rests now with the fruit-growing counties whether they shall exercise their constitutional rights and be properly allowed to enforce in their several counties the destruction of the fruit pests. And it may be necessary to repeal the machinery of this law that has been referred to that has not been in force. All of the counties of this State are not interested in this fruit pest question, and they will not pass ordinances relating thereto, but counties that are largely interested in fruit growing certainly will, if the fruit growers interest themselves in it, and secure from the Board of Supervisors such legislation as they desire, and further than that, see that such legislation is put in practical operation and enforced. The State of California can very well double, if she choose, the appropriation allowed this Board, and should do so; that comes from the State at large; the rest ought to come from the fruit counties involved, and good work could be done by doubling the appropriation in those localities; and the resolution to that effect to have it properly presented to the Legislature, to repeal this law and double the appropriation, will open the way so that the counties and individual fruit growers in this

State could take action in the matter. This communication from the Grange of Santa Clara County I believe should not receive the assent of the fruit growers, for the reason that the whole question has been settled. The Constitution is too clear for any question on the subject of taxation; the duty of the Assessor is pointed out by law; the Constitution provides that the tree shall be assessed separately. Under the old Constitution, and the assessment laws in vogue, improved property was assessed as improved property at its value, but under the new Constitution of this State it becomes incumbent on the Assessor to assess your land as unimproved and add to that the improvements. Now what difference does it make if I have property that is worth $200 improved, and the Assessor comes along and he assesses my land at $100 an acre and assesses my fruit trees and improvements at $100 more? It is the same assessment that he would levy anyway, only in the first instance I see it, and in the second instance I don't. A question was up in Santa Clara County to the Supreme Court which presented nearly this question; the Assessor assessed their fruit trees separately, as he was authorized to do by law; the question arose as to the constitutional right to assess trees, claiming that it was a part of the realty and should be assessed with the realty, as the roots go down into the ground—a conveyance, you are aware, of land conveys everything under the surface and above the surface, and it would convey trees or buildings without mentioning them in the conveyance—but the Supreme Court held that it was entirely constitutional and the duty of the Assessor to assess the land and the trees separately, and it has been done so, and that being the decision of the Supreme Court, it settles the question until we have a new Constitutional Convention and change our Constitution. I think it would be well to appoint a committee, to report this afternoon; some action might be taken by this convention, and I move that a committee of five be appointed, to act in unison with the State Board of Horticulture, and report some resolution for the action of this convention.

Mr. Wilcox: Mr. Leib, who is one of our best lawyers, carried that matter to the Supreme Court, and I understand the decision rested not on the Constitution, but on the statute law of this State, which required the Assessor to assess trees separately.

Mr. Stabler: The only apparent reason to make a change in the way of assessing property in this State, is because it is too high; now, there can be no difference in the assessment. My friend Mr. Wilcox does not intimate that his property is assessed too high. I know as a fact that my orchard property is not assessed half high enough; it is not assessed at one third or one fourth of what I would take for it, and it looks to me to be rather a single-idea matter to contest a thing that there is no reason for, except that you hope to keep a few cents more in pocket by merging the two things together and not assessing them constitutionally.

Mr. Hatch: Some years ago there was an effort made to have a law passed for the suppression of the insect pest. At that time had the effort been successful, we might have had no insect pests compared with what we have. Now the land is covered with them, and we have no opportunities to free ourselves except it may be as Mr. Lubin proposes—as has been done by monarchial government. There are men in this country who, if they had but a dozen trees, would fight any law; they would spend $1,000 where their tax might not be 25 cents, rather than have something done for the general good. It would seem as if there ought to be a little of this monarchy business in a thing of that kind. In the case of a glandered horse, I believe there is a law that will cause it to be killed; and a tree that has a pest that is incurable and contagious, ought to be killed. But

we have never been able to get anything of that kind; in fact, whenever we did get a law that was worth a cent, it has been declared unconstitutional. There was one that boxes should be disinfected at the point to which the goods were shipped before they were returned, and that was beaten by the fruit growers; and I am happy to say that the very fruit growers that beat the law carried these pests home in their boxes, and have as many now as anybody; and one of those men expressed himself in the ante-room of the Senate that they were isolated, and could take care of their own fruit, and everybody else's fruit could be destroyed, and they would get a big price for theirs. I think the time has passed when we can do anything effectual in fighting fruit pests by law. We must make a law unto ourselves; we must each and every one of us put a place in our expense book for the means of fighting these insect pests and preventing their introduction into our own orchards, and endeavor to induce our neighbors who do not make a specialty of fruit growing, but have a few fruit trees, join with us, for they are the most dangerous ones we have—those who do not make a specialty of it. It has gone too far, so far as laws are concerned; they will be ineffectual; but as to the matter of appropriating for this Board, I do not know how large an appropriation might be made that would not result in benefit in proportion to the amount of money put in the treasury for their purposes. It can be made of immeasurable benefit to the State.

Dr. Kimball: We have now in California a State Board of Horticulture, they have been for six years giving serious and continuous attention to the discussion of the fruit pests as well as to the general interests of the orchardists of the State, and it seems to me that any committee that should be appointed by this convention to frame resolutions to go to the Legislature, should act under this Board. Now, I question whether we can wipe out all the laws relating to insect pests, and why—because San Francisco right at the threshold of the State, through its vast importations of flowers and shrubs, and trees from all countries, is the point from which these pests have been distributed all over the State, and it is the point from which we might expect additions to those that now exist. We must have somebody right there at hand who takes cognizance of every importation and watch carefully that new pests are not spread all over the land. I know that good has been accomplished during the past two years from the inspection of goods from China and Japan, and it seems to me there must be a watchful guardian right at the threshold.

Mr. Johnston: I hope this motion will prevail, and that one half of the committee appointed will be constituted of members of the State Board of Horticulture, and that all of our work in this direction shall be done through that body, for the reason that it is an organization recognized by the State, and with which this body is expected to coöperate. In regard to repealing laws, I do not believe we have too much law on the subject. I think that the laws on the statute books to-day are good laws, and well adapted to the wants of the people. What we do lack is education of the fruit growers themselves upon the importance of this matter; what we want is coöperation among the fruit growers and unanimity of action, for whatever laws you may have would be of no consequence unless the people were in unison with those laws. They have laws in South Carolina by which every male citizen over twenty-one years of age would be entitled to a vote, and to have that vote counted; they do not do it. We have laws upon the statute book by which these insect pests can be exterminated; they are not exterminated, and we know they are not; but we believe that if the laws were properly administered, and if the people were educated

up to be in unison with the laws, and worked conscientiously to assist the officials whose duty it is to execute the law, we would be in better condition to-day in regard to this insect pest. Mr. Hatch seems to think that the levees are all washed away. I do not think so; I think we have been repairing it for two years. I do not think there are as many insect pests in the State as there were two years ago, or one year ago, and I do not believe there would be as much one year hence as there is to-day; we are conquering it; we may not be able to exterminate it, but I have faith in the ingenuity of the white man, and he will conquer it to such a degree as will make fruit growing profitable, but in order to do so, we must coöperate together. Something has been said about taxing fruit trees. I am in favor of taxing fruit trees, and then I am in favor of going to the Legislature and asking them to appropriate that tax for a special purpose for the benefit of those trees. I think if we have a little more tax on the fruit trees to go as an appropriation for that purpose, we will have a fund sufficient to kill all the bugs in California; and until we have some such appropriation, and until you tax the man who is too lazy, or too trifling, too negligent to kill a few bugs that are in his yard, we will never exterminate them; but if you make that man pay a tax upon those trees, and let him understand that that tax is appropriated for the special purpose of cleansing those trees, we will in time find that every man who has a fruit tree, and has to pay whether he doctors that tree or not, will be taking care of it, and the number of the bugs will be greatly reduced.

The motion of Mr. Aiken for the appointment of a committee was carried.

THE PARIS EXPOSITION.

Professor Husmann, of Napa: Mr. President, ladies and gentlemen, I do not desire to take up your time, but I will refer you to a few documents pertaining to the matter, to enable you to fully understand the objects of the Department of Agriculture, which I have the honor to represent in this matter of the Paris Exposition. [Reads circulars issued from the Agricultural Department.] You will at once see the vast importance of this exhibit at Paris, where representatives and visitors from all parts of the world will assemble, and I need not point out at great length what a feather it would be in the cap of this State if we could show them dried fruits better than France can produce, dried prunes as good or better than they produce; if we could show other nations that we produce as good a fig as has been shown here; if we could show to France, the great wine-growing country of the world, which has always taken the lead in those matters, that at this early day we can, as I am fully confident we can, produce as good wines as they, and as good raisins as Spain produces. We can easily see the importance of this matter, and while the department has taken this matter in hand, they also solicit special exhibits, either by counties or States, and I am rejoiced to hear that the State Board of Trade is making up such a collection, and also that the State Viticultural Department is making a collection of wines which they will furnish specially, and they have also promised me a full assortment, and have kindly offered me a room in their new building in Platt's Hall, where I can collect and pack all samples forwarded to me. At first I thought I was only empowered to act in regard to viticultural products, but since then Professor Riley has also requested

me to collect all the information in regard to the olive culture, olive and nut culture, and the dried fruit industry, that I can obtain to assist Professor Landeman in his arduous work. Mr. Cooper has already prepared full information on the subject of the olive, and a full exhibit. We know he is the highest authority in this State, and I am also glad to hear that my friend Mr. Kimball of San Diego is preparing an exhibit and much information. I hope, gentlemen, that all of you will give me such assistance as you can, and I need not tell you that it will accrue to the lasting benefit of our State.

Mr. Lelong: Some time ago I received an invitation from the Department of Agriculture in relation to the matter, and started to prepare an exhibit, and now that Professor Husmann has been appointed I shall be very glad to turn the matter over to him.

CITRUS CULTURE.

ORANGE GROWING IN BUTTE COUNTY.

Mr. Jesse Wood, of Chico: I only received notice at the recess of yesterday's session that I was asked to prepare an essay, and of course, that time was very short. The shortest speech reported was that of Dean Swift, who was once requested to make an address and take a collection for the orphans of an asylum. He gathered all the children on the front seat, and when the time came for his address, simply waved his hand and said, "There they are, proceed with the collection." All I have got to say is, "Here they are" (showing oranges), and that is speech enough. I want to say, however, these are seedling oranges from trees that I planted with my own hands on perfectly new ground that had never been broken by the plow—government land that I took up in the hills near Chico—and I was in such a hurry to get some orange trees planted, that I didn't wait to plow the ground. I took it just as nature had left it, and plowed it the best I could and spaded around the trees. Of course, I planted nothing but seedlings, for we had nothing but seedlings in Butte County. There was but one man in the county at that time that had any budded fruit at all, Mr. Wilcox, of Oroville. Since then I have planted budded trees, and also a great many seedlings. I have seven and a half acres growing now and three thousand little trees getting ready to grow, some of them three years and two years old. I expect to increase my orchards until I have twenty acres at least of orange trees, besides some olives and grapes. We have been saying here from time to time that we grow fruit for money, not altogether for glory. I grow it partly for money, partly for glory, and partly for the fun of the thing; if there was not any money in it at all I should want to grow all the trees I possibly could on my place. I was a Methodist preacher some fifteen or twenty years in my life and traveled from place to place, and I never lived in a parsonage in all that time but I planted a tree in the yard, and if there is anything that I want to thank God right now for it is that he planted that sentiment in my heart. We grow oranges here in Butte County very much like these, as high up as twelve hundred feet above sea level—at Cherokee, the old mining town between eleven and twelve hundred feet above sea level, and they bear very luxuriantly, and in different places, all over the county, they have a few

trees. One place about a thousand feet above Oroville they grew trees from the seed and fruited in seven years; but there was a Frenchman there and he made them bear very rapidly. In the valley, here in Chico, there are a number of trees bearing, notwithstanding we had snow on the ground last winter for two solid weeks. I was editor of a daily newspaper here and took particular pains not to say anything about it. There is no harm to tell it now because our orange trees were not all killed, but at that time I wouldn't give a two-cent piece for all the oranges in this county. At Oroville, and in our place in the foothills, there were three winters in succession during which there were only three nights the entire winter when we had any frost at all and that was during the last week in December and the last week in January, at an elevation of three hundred feet above the valley; about six hundred feet above sea level. At Biggs aud Gridley, as you pass along the railroad, they have orange trees bearing finely. At a place across the river on the Colusa side, orange trees have borne finely for several years, and this year, after such a winter as we had last year, it is an astonishing fact that the trees here in Chico and everywhere else are loaded with fruit. Now we don't claim that Chico is particularly an orange region, but the foothills we claim are equal to Riverside, Los Angeles, or any other place, not that I say Butte County, but from Shasta to San Diego, it is all California, and it is all a matter of locality. Get into a sheltered nook anywhere along the Sierras, and you can grow such oranges as these seedlings, and in the most sheltered places you can grow the most tender varieties of the budded plants. I have lemons also this last season, and although we had no snow on my place at all, when they had it for two weeks on the ground here, I did have ice half an inch thick and the ground frozen six inches deep night after night. I say I wouldn't have given anything for the trees at all and thought the last citrus fair had been held in Butte County, but even the lemon trees at my place after such a season as that were not killed; the outer limbs were killed but the stocks were alive, and are now coming on and spreading finely. I had thirty-two lime trees on my place; they were killed to the ground and at least half of them are sprouting out and have sprouts on three feet high. That tells the whole story, gentlemen; any of you that want to go into orange culture need not go to San Diego to do it. I would not advise you to go to the top of Shasta, but simply to any sheltered nook along these foothills in Butte County and in Tehama—all along this coast. It is a remarkable fact that after the frost of last winter, the orange trees are more loaded this year than they were last. Another remarkable fact is that our fruit is ripe six weeks before the fruit of Lower California. Another thing, my next door neighbor was the first man to make raisins in America, and he exhibited at the World's Fair at Paris, in 1877.

Mr. F. A. Kimball: I have to inform the gentleman that my brother at National City made in 1874 over eight hundred pounds of as fine raisins as was ever raised in any country.

Mr. Wood: The gentleman I refer to exhibited raisins in Paris in 1877, and he had made raisins for ten or eleven years before that.

Mr. F. A. Kimball: These oranges exhibited are in an exceedingly unripe state, not nearly gotten their growth.

Mr. Wood: We do not say they are ripe, but we say they are six weeks riper than yours.

Mr. F. A. Kimball: I think you have the advantage of nearer three months in ripeness: we won't have a ripe orange in San Diego until the very last of March. This orange only has to be examined by the side of a fine orange to show its character, and if it is approaching anywhere near

its ripeness it could not be considered by an expert as being up to the standard.

Mr. Johnson: I have been requested to call the attention of the convention to a sample of Thompson's seedless raisins or grape. They are raised two miles west of Yuba City, are enormous producers, and seem to be a very fine article for cooking purposes.

Mr. Slayden, of Oregon: Our fruits in Oregon are not the same as yours; you are growing the peach, the apricot, the nectarine, and the grape; we can't grow those, and our attention is called to the prune, the pear, and apple, and we are bringing some of those productions down to your people, and we are taking in return your productions, and, among others, the first I saw were these raisins of Mr. Onstots. I want to say to you gentlemen, as I have traveled up and down your beautiful country, I never saw such trees in my life as I have seen here. I have crossed the Atlantic Ocean eighteen times, always as a fruit man, but it has been reserved to me while the recipient of your bountiful hospitality, which is as far reaching as the fame of your beautiful fruits, that I have seen the finest growth of trees and the finest fruits of those descriptions I ever saw in my life. When this exhibition is taken to France I should be very glad to contribute my mite; we have there in Oregon some fruits that I do not think the Pacific Coast need be ashamed of; at the Mechanics Fair and our State Fair I had on exhibition from young trees some twenty-four varieties. Those prunes, as dried last fall, sixteen would make one pound, one ounce to a prune; in the best French prunes forty to forty-five make a pound. I say the world cannot match that growth of sixteen prunes to make up one pound, and we will have those in two years in such quantities that it will be a moral impossibility for the *Turkish* prune grown in *Servia*, *Bosnia*, *Herzogovania*, *Monrovia*, and all those countries, to find a foothold here at all. We are going to drive them out just as much as we are going to drive out a good many of those other things, including the Zante currant, which will be raised here; just as well as we are driving out the raisins from Spain. That time has arrived, gentlemen, and you are shipping your raisins clear to those European countries; and the next move you will be cultivating sugar from one end of California to the other, not only supplying the whole United States, but your product of sugar will be shipped to Europe.

Dr. Kimball: I would like to inquire the name of the prune that weighed sixteen to a pound?

Mr. Slayden: That is the Silver Prune. There is a great discussion in our vicinity in that regard; we have our Silver Prune and our Coe's Golden Drop—opinions are various in the matter—I think, however, the difference is very slight between the two. The Silver Prune takes wonderfully well East. We have the Silver Prune, the Golden Prune, and the Italian Prune as the prunes of our State; they each and all of them are an acid prune, some like the European, requiring a little sweetening as they are cooked.

Mr. Smith: What is the difference between your Golden Prune and your Silver Prune?

Mr. Slayden: I can scarcely tell you; they seem to me very much as if they were first cousins—a little smaller, the Golden Prune is, and very bright, like a piece of amber, when it is dried.

Mr. Smith: Did I understand you to say that your Italian Prune was a native of Oregon?

Mr. Slayden: No, not at all; I think it is very similar to your *Fallenberg*, but I don't think you have the right name for either of them, because the *Italian Prune* would convey the idea that it was a native of Italy. I am at variance with most of our fruit growers on the subject; some of them have

the audacity to claim the *Black Republican cherry* as an Oregon production; one gentleman said he had produced it in Iowa; now it happened that I chanced to have a farm close to him, and I could no more get a Black Republican cherry tree to grow there than I could on top of Mount Shasta. I have eaten that Black Republican cherry in Europe off trees older than either you or I. I think that that *Italian Plum* should be called the *Mussel Plum.* I have seen it grow in Italy and in the various provinces of Southern Europe, and is called so from one of two sources: the shape of it is something like a mussel; it may have been derived from that, but I think the far more reasonable supposition is, that way back in the fifteenth century, at the time of the crusaders in Palestine through Turkey, that that plum was brought from there because there was the center of all civilization, both in science and agriculture, where the *Moors* and *Saracens* held possession, and if it was brought from that country and was named the Mussel Plum from being taken from those Musselmans, I think that is the proper name for the *Italian Prune.*

NEW SEEDLING APPLE.

MR. WICKSON: There are some apples produced here—seedling—and I would like to have a committee appointed to examine and name them.

The Chair appointed as such committee John Rock, C. W. Reed, and B. G. Stabler.

LEGISLATIVE COMMITTEE.

The Chair appointed as a committee to act in conjunction with the State Board of Horticulture, relating to the law about insect pests and a new appropriation, Hon. W. H. Aiken, Hon. S. J. Stabler, Hon. William Johnston, Mr. Milton Thomas, and Mr. P. W. Butler.

Here a recess was taken until two o'clock in the afternoon.

AFTERNOON SESSION.

REPORT OF COMMITTEE ON LEGISLATION.

HON. W. H. AIKIN read the report of the committee, which was adopted, as follows:

CHICO, CALIFORNIA, November 23, 1888.

To Fruit Growers Convention of California:

Your committee appointed to consider and report upon legislation and increase of appropriation for the annual expenses of the State Board of Horticulture, respectfully report a memorial to this Legislature for an increased appropriation. The same to be presented to his Excellency the Governor of the State, and to the Senate and Assembly, in Legislature assembled, through the Secretary of this convention.

W. H. AIKEN,
Chairman of Committee.

MEMORIAL TO THE LEGISLATURE.

CHICO, CALIFORNIA, November 23, 1888.

To the honorable the Senate and Assembly of the State of California, in Legislature assembled:

Your memorialists, the fruit growers of the State of California, in their annual convention at Chico, this twenty-third day of November, 1888, most respectfully represent:

That the soil and climate of this State are adapted to the growth and preparation of fruits of good quality, and in quantities sufficient, eventually, to supply the demand for such products in the United States.

The success of fruit culture is of the highest importance to this State and nation.

That the State Board of Horticulture, created under Act approved March 13, 1883, has, since its organization, accomplished great good, and its work has been of incalculable benefit.

That the demands upon the Board have become so great and its opportunities for benefiting the fruit industries of the State have become so varied and multiplied, it is of the highest importance that future appropriations be much increased.

Your memorialists, therefore, respectfully and earnestly request the Legislature of the State of California to appropriate $20,000 for the annual expenses of the State Board of Horticulture.

W. H. AIKEN,
S. J. STABLER,
WM. JOHNSTON,
MILTON THOMAS,
P. W. BUTLER,
Committee.

On motion of Dr. Kimball, it was ordered that the committee be continued, to act in coöperation with the State Board of Horticulture as to legislation for furthering the development of fruit interests connected with the Board and with the State.

Hon. S. J. Stabler offered, by request, the following resolution, which was adopted:

Resolved, That we, the fruit growers of California, in convention assembled, petition the Legislature of the State to increase the appropriation for the State Board of Horticulture, so that said Board be enabled to better protect the horticultural interests than with the meager appropriation allowed said Board. And be it further

Resolved, That His Excellency the Governor be and is hereby requested to recommend the increase of appropriation in his message to the Legislature.

GROWING FRUIT WITHOUT IRRIGATION.

Essay by Geo. Ohleyer, Yuba City.

It seems almost idle to affirm that fruit can be grown in the Sacramento Valley without irrigation. Nowhere in this or any other State has fruit made such wonderful progress in all branches as it has in this valley, all without irrigation. This being a fact, argument would seem to be superfluous, and we might with more propriety turn our attention to the question of what to grow, and how to grow it. Possibly not every acre of land in the Sacramento Valley will grow successfully fruits or vines without artificial water, but being very greatly in the minority their necessities should not control the desire and reputation of the great majority.

It has been abundantly shown by actual experience that too much water is as injurious to fruit as too little. It seems therefore necessary to find the "happy medium," and as such we offer you the matchless Sacramento Valley. We offer it as nature's work and the best inheritance of man. What has been accomplished in horticulture here is the natural history of our State; what has been done elsewhere required bolstering up by artificial means. Our fruit growers understand the causes, of which I may be excused for giving a few.

First, water in quantities almost like the ocean underlies our valley, from eight to twelve feet beneath the surface, and the capillary attraction carries the moisture to the roots where it can do the most good.

Second, the attracting forces are greatly augmented by cultivation, and benefit the trees and fruit in proportion as the work is done more or less

thoroughly. I am speaking of the valley as a whole—the great plains or uplands—and not of the bottom lands; these speak for themselves, and are distinct in soil and formation from the clay and sand-mixed uplands. To retain moisture the latter require cultivation, while the former do not. The great philosopher, student, and editor, Horace Greeley, in an address delivered at Marysville in 1859, on the occasion of the State Fair, pointed out how to bring moisture in the absence of summer rains. The recipe was nothing more than deep and thorough cultivation. The writer, then a young and inexperienced farmer, sat beneath the renowned orator, and was surprised over the assertions of the great stranger, that we could thus coax the moisture from its lower levels to the roots of not only our trees and vines, but to our grain, grass, and vegetables. He (the writer) had worked for a man that ceased cultivating his young potatoes, that the moisture might not escape into the air. Singular as it may seem, the theory of summer fallowing our uplands for wheat was accepted and began to be practiced about that time, and the result was an overwhelming surprise in favor of this method. We cannot discuss *all* the whys and wherefores of the phenomena, but it opened the pores of the soil, which were readily occupied by the hitherto imprisoned moisture, and thus were revealed all the requisites for fruits and vines. These wheat fallows keep alive and thrifty, until the winter rains set in or frost ensues, Indian, broom, and Egyptian corns, every variety of melons, squash, or pumpkins, tomatoes, cucumbers, beets, and the like. Now, as none of these root as deeply as fruit trees and grapevines, their success is accounted for. A glance at these conditions also reveals the cause of the superiority of our productions. Thus the fruit takes all the moisture it wants, and no more. It receives the warmth of the surface and the sun, and thus is produced the size, the flavor, the sweetness, and the wealth of valley fruits. That exceptional seasons arise argues nothing against our theory, because exceptions recur and have recurred since the world was thrown into space. The best means at hand to overcome exceptional seasons is to assist nature with extra cultivation, reducing the surface of the soil to powder if possible, and to thin out the fruit to the capability of the season. Where this has been observed no deterioration of quality and size, and little, if any, of quantity, has occurred within the writer's knowledge. I am not called upon to condemn irrigation in the valleys, mountains, or foothills. It is a local question, and addresses itself to localities and communities, who must work out the problem to their own satisfaction. Where so much has been accomplished as in the Sacramento Valley without the harrassing and expensive use of artificial water, and where such brilliant prospects meet the eye on every hand, nothing more need be said by me on "Fruit Growing in the Sacramento Valley without Irrigation."

DISCUSSION ON IRRIGATION.

Mr. Flournoy, of Tehama: There is an opinion in this State that irrigated fruit cannot compare in quality with that not irrigated. In one respect it is true, and another it is not. Proper and improper irrigation are two very different things. While but an infant in fruit growing, I have had six years experience; and while I can grow fruit without irrigation, I can grow better fruit on the same land with irrigation. To illustrate: I have some Peach trees, Orange Clings, and the ends of some of the rows run into the bottom; the others are on the bend, four feet above this bottom land, where I irrigate; the other I do not. The fruit on the lower land is larger without irrigation than that on the upper land, and my neighbors in com-

ing after peaches prefer that on the bottom land; but Mrs. Flournoy tells me when she wants fruit to can to get it from the irrigated fruit. You may deceive grown people, but you can't a three-year old child. My little boy, three years old, will go to the orchard and refuse to take the finest cling peach on the bottom, and go to the hills; he says it is better fruit. I would say to those who have water on the land to keep it as far from the tree as possible; never wet the surface of the soil if you can wet the roots of the tree without it. I have always endeavored to keep the top of the ground as dry and as well cultivated as I can; this will keep the roots moist below the surface, and will not be affected by the rays of the sun. The object in keeping the water away from the trees in our section, is that in the fall of the year we are compelled to take the water away from the tree that the wood may harden; if not, our trees continue to grow until the frost, and then if we have a hot spell, as we do in our section of the country late in the fall, there is an injury to the tree if the root is near the surface; and I wish to again call the attention of the fruit growers of this convention to the effect of keeping the water away from the tree; that is, upon such land as mine, sharp grade gravel and sandy loam; I have no experience in irrigating clay land.

Mr. Wilcox: I have had considerable experience in irrigation for twenty-five years, chiefly in small fruit, for where I live we can't raise berries without it. I had sixty acres of berries twenty years ago which I irrigated from a single well. That is a heavy soil, where by going five or six feet deep the water will come to the surface, and there I am raising the prune trees on Mirabolan stock. Cherries have died; magnolia have died; almonds have died, for the reason of too much water. I put in twenty acres of blackberries, and ridged it to get above the water, and after a couple of years they got to the water—it wouldn't do. The proof that irrigation is necessary in Santa Clara County is that prune growers who said two or three years ago that my prunes wouldn't do because I irrigated, are now bringing ditches into their prune orchards. Mr. Ingals, who has the oldest prune orchard in the county, is paying for pumping water twice in the season on that orchard. I hold then, in most sections when your trees get large, you need irrigation. I have sometimes thought if a tree grows too large, it gets its growth and stops; I have seen such a tree take new life from irrigation. I have seen apples take their second growth after having been irrigated. You have got to have water, if it is not in the soil, you have got to put it there—too much water won't do—it won't do for the cherry, nor any tree that has got a porous, thick root like the cherry or the blackberry. In my hand I hold the result of an interview with a canner in San José on this very matter. They decided that the irrigated fruit is the best for them as a rule; it won't keep quite so long, perhaps. There is such a thing as irrigating too much; if you irrigate strawberries too much, they will be softer and won't keep so long. By irrigating as I do, I have my trees thirteen, fourteen, or fifteen feet apart, and they fill the whole top. Mr. Block's pear trees are so thick together that the tops form an arch that meet, and he raises fruit that sells for the highest price.

Mr. Hatch: I don't know anything about irrigation only what I have been told. In the locality where I live we find that good cultivation makes good fruit and plenty of it. I was told this week that the irrigated fruit for canners was not so liable to mush in the cans. I know that there is a great difference in cultivation, and irrigation is a great deal better than no cultivation. It seems to me in countries where there is not sufficient rainfall that water must be applied in some manner or else fruit cannot be made, but my experience has been in rich soil without irrigation and with

cultivation. Right in our valley, with a fence between, might be seen the difference between cultivation and non-cultivation, or, as I call it, irrigation and non-irrigation; one was irrigated with the cultivator and the other was not, and we found moisture there during the year sufficient to make Orange Clings that would weigh seventeen ounces where the water was twenty feet from the surface, and Bartlett pears that sold this year as high as $6 a box in New York. In reference to Bartlett pears, several of the shippers have told me that they didn't want Bartlett pears raised near the coast for eastern shipment; they are beautiful and good to can, but they are tender, and will melt away much sooner than those raised without irrigation. I had a little experience one time with some raised on the coast, near Vallejo; mine were raised about twenty miles from there. Those from near Vallejo were brought on the table at the opening of the fair, placed there in green condition, and mine had been picked two weeks, and were yellow when they were taken there. At the end of the fair those from Vallejo had melted, flattened down on the plate, and those that I had placed there were still firm. I believe, as I said before, that there are many places where irrigation is necessary—where they have plenty of gravel and loose soil, plenty of climate, and plenty of water—that will make good oranges and some other fruits, but I do not believe fruits raised by irrigation will carry for eastern shipment nearly as well as those without it, but to raise them to a large size without irrigation I know must be with good cultivation.

Mr. Johnston: I agree with what Mr. Hatch has said concerning irrigation. It is probably true that on some soil you can raise better fruit with irrigation than without; but if you have good soil where you can raise good fruit without irrigation, you can raise a better article of fruit, and fruit that will last longer, keep better, and bring a better price, than fruit that has been irrigated. A great many irrigate more than is necessary; they do not use Mr. Hatch's ditch enough, that is the cultivator, the plow, and the pulverizer; that is the greatest and best irrigator and the one that will produce the best results. The peaches that bring the largest price and that produce the most money to the acre in California that I know anything about, are grown on lands without any irrigation. Mr. Wilcox spoke of canners preferring irrigated fruit in San José. Perhaps it is necessary to irrigate in San José in order to have large, fine fruit; but I know of one instance of canners in Sacramento that have been in the habit of using fruit that was raised on a ranch that was not irrigated, a year or two ago, and when we had a very dry year, one party who had made a contract with the canner for his fruit at a certain price per pound, irrigated his fruit; of course he had larger peaches and larger pears than he would have had without irrigation, but the consequence was that the next year the canners refused to buy his fruit unless he agreed to produce it without irrigation. The fruit became soft, and as the canners termed it, it sloughed off, melted down in the can, did not keep its shape, as fruit that had been raised on the same ground with cultivation. There is a good deal of good land in California that will produce fruit without irrigation, and that is the kind that I prefer.

Mr. Hatch: I would like to tell what I know about cultivation: I made a contract with some men to work several places this year and that contract says "plow the trees twice, once away from the trees and once back, harrow twice, cultivate ten times, weed cut three times, and hoe the trees five times."

Mr. Hall: I do not claim that I know much about the fruit business or irrigation, but to some extent I have given some attention to it, and I think that, generally speaking, our opinions of irrigation are formed according to

the soil in which we happen to be engaged in fruit growing. In some of the valley lands, where the moisture comes near the surface of the earth, it is not necessary that there should be much irrigation; but there are certain places in the State, especially in the foothills, where I do not believe it is possible to make a very great success in the business of fruit raising without irrigation. On any land that is easily drained I think it is necessary to have a good deal of irrigation, and the easier you can have your land drained, and the more water you put on, the better and larger fruit you will have as a rule. In Placer County, where I live, they cultivate as much as they can, and at the same time they all use water; many of them have tried to get along without irrigation, but they have found that it is not profitable; they find that the price paid for water comes back to them many times—by a proper use of water—they of course recognize the fact that it is not necessary to flood the land with water. We raise peaches rather more than we do any other class of fruit, and we fancy that the peaches of that country are the equal of any in the State, and I believe they have that reputation abroad, and in almost every instance where they have the best fruit, they are raised by irrigation. I am told, in the lower counties (by a gentleman who lives there) that they do not attempt to raise very much fruit without water, if it is possible to get it. We think in El Dorado County that water is the only means by which we can produce good results; cultivation may be recognized as being important, and it will assist very materially in the production of good fruit, but no one there any longer attempts to produce fruit without the application of water.

Mr. Wilcox: By irrigation we do not have to do half the cultivation that he does there, but I would say cultivation should follow irrigation if we do it properly.

Mr. F. A. Kimball: Last April, at the horticultural meeting in Santa Barbara, I exhibited some very fine specimens of oranges, which I am informed by our Secretary, Mr. Lelong, were still on exhibition, having been sent from the Santa Barbara meeting to the Board rooms at San Francisco, and have been there on exhibition until within the past two weeks. They were picked about ten days before the convention, that is, early in April. They were grown on adobe land where the water is not less than eighty feet to the surface. The oranges were irrigated, but not copiously, as they were irrigated from a well—the orchard covering some eight or ten acres—so I am fully of the opinion that the subject of irrigation must be applied to the locality and the character of the soil largely. No one rule will apply to all sections of the State; you must study the locality and the condition of the soil. Some of those oranges having stood up so well for so long, it does not argue very well against irrigation. I made an experiment I think it was some five years ago; I picked and packed one box of oranges, I think there were eighty-four oranges in the box, and they lay in that box for eighty or eighty-one days, and I did not lose a single specimen. Those oranges were irrigated and finer oranges you will go a long way to find.

Mr. Johnston: I have a piece of peach orchard that has never been irrigated, from which I sold the crop on the tree without picking, packing, or any expense at all, and it paid me at the rate of $500 an acre for the peaches on the tree, and there were one hundred and sixty trees to the acre; no irrigation.

FLORICULTURE.

THE FUTURE OF FLORICULTURE IN CALIFORNIA.

Essay by EMORY E. SMITH, San Francisco.

The word "horticulture," when used in European countries, is intended to convey a general idea of all things pertaining to gardening pursuits. In the United States, with our business intensity, there has been manifested in the last few years, a strong tendency to separate horticulture into three distinct classes, fruit growers, floriculturists, and vegetable or market gardeners.

California, which at this time is the most rapidly developing portion of the United States, exhibits more decidedly than any other portion of the country, this tendency to sever these mutual interests.

To a certain extent, this is proving disastrous to our general horticultural prosperity, by drawing the attention of the public exclusively to the stronger division, "fruit growing," thus bringing about the dependence of the State upon one branch of industry; notwithstanding statistics prove that countries which are the most truly prosperous have many resources.

Vegetable gardening, one of the most important of healthful food supplies, has suffered the most seriously, and so great has been the neglect of this important industry, that we pay annual tribute to Chinese and Italian peddlers (perhaps millions of dollars), to furnish us with the every day food with which our own gardens should supply us.

Floriculture, ornamentally speaking, has been one of the chief agents in attracting to California the thousands of prosperous settlers who have built our cities and redeemed much of the waste land from the jack rabbit and coyote, and are now making it blossom and bring forth our luscious fruits, which have become so famous in the various marts of the world.

Deprive California of its beautiful climbers, palms, magnolias, and other graceful evergreens, destroy the fragrant roses, and this famed country would be a dreary waste in which but few would care to remain. This contrast is drawn to show the vast importance of home and wayside adornment. Each ornamental tree and flower that is planted is of intrinsic value to every industry. The spirit of adornment should be fostered by careful thought and concentrated action; for the land of balmy odor-laden breezes, radiant with sunshine, bedecked with graceful evergreens, and brilliant with the varied hues of the rarest flowers, soft velvety lawns, and orchards in which delicious fruits are ever ripe, is the ideal for which all are searching, and which is within the possibilities of California.

Floriculture in our State, commercially speaking, is now entering upon a new era, and the probabilities are that in years to come it will rival and be second only in commercial importance to the fruit industry. The State Floral Society, which has recently been organized under the most auspicious circumstances, has a future brilliant with educational possibilities, which will play no unimportant part in the future development of the State, and I bespeak for it the good will and hearty coöperation of all those who would see our country the veritable paradise to which it has been so aptly likened. It is the earnest expressed desire of this association to form floral clubs in the various portions of the State to further the interest of this

industry, and provision has been made for Presidents of all such clubs to be Vice-Presidents of the State Society.

The soil and water supply of California is varied to a degree that admits of the most intricate methods of cultivation, and the climate, though mild and sometimes warm, does not cause the lassitude so destructive to the commercial enterprises of some countries.

So far as I have been able to ascertain there is no similar area of country in the world in which there can be grown successfully so many flowers, bulbs, trees, and plants, of the various zones.

It has been an open secret for some time that California would, in the near future, be a formidable rival to France, Holland, and Germany, in the production of flowers, seeds, and bulbs, which it now costs the United States millions of dollars yearly to import. Just here I will say that many of the high priced seeds in fancy packages which are brought from the Eastern States originally, are grown in California.

Systematic experimenting has proven beyond doubt that our flower seeds mature better, keep longer, and have a higher germinating power than those produced in other countries.

Most of the flowering bulbs grow, multiply, and mature unusually well in many parts of the State, and we have a much larger acreage suitable to their highest cultural perfection than has Holland or Germany. A few days ago, while walking by courtesy through the beautiful grounds of a Chico gentleman, he pointed to a lot of tuberoses and said: "They are very fine; I got them from Boston." Mr. President, ladies and gentlemen, California raises the best of everything, and instead of sending our money to Boston, we should send Boston our products with compliments.

The large variety of rare ornamental and flowering plants that can be grown here, at small expense, and California's proximity to Mexico, Western, Central, and South America, Australia, Japan, China, and the Pacific Islands, entitle our florists and nurserymen to a very large exporting and importing trade.

Eastern dealers are evincing their faith in our future floral greatness by eagerly purchasing all the floral products which are offered in a salable condition, and a limited export trade with the European countries has sprung up in the last two years. What is most needed to develop these valuable branches of trade is men experienced in the business, who are willing to invest money, and wait a reasonable time for the development and returns which are sure to be highly satisfactory.

Among other developing floral enterprises, hybridizing for new varieties will no doubt some day bring fame and fortune to our State, for no other country can boast of such favorable conditions for the prosecution of this art, and the door stands wide open to genius and perseverance.

The shipping of orange blossoms has become a source of increasing revenue, and cut flowers have been successfully transported to the Middle and Eastern States.

The manufacture of perfumes has been retarded by the lack of a knowledge of the business, and tons of blossoms perish that should be a source of wealth. There is a mistaken idea sometimes expressed, that our flowers are not so fragrant as those of other countries. This is, of course, untrue. The growing of medicinal plants also is an infant industry, which bids fair to supply America with the greater portion of her own drugs, thereby greatly reducing the tribute paid to the foreign countries from where nearly all are now brought.

The growing of plants for dyes and textures has proved successful, and is rapidly being developed.

The intrinsic value to California of this floral future lies in the utilization of her broad uncultivated acres and the general prosperous independence of her people; for in Flora's dominion, unlike any other, there is work, health, and happiness for every man, woman, and child.

None of the horticultural industries of California can be fully developed until we have located in our State a great and perhaps national botanical garden, in the grounds and conservatories of which there could be collected the florals, both useful and ornamental, from the various portions of the earth. It should be a national school to which all could go and drink to the fill of accumulated knowledge, and should be free to all.

How shall we hasten this cultural magnificence which is waiting to transform our State into a fairer picture than poet's pen has ever traced? "By scattering seeds of flowers by the wayside everywhere," by scattering seeds of floral love in the hearts of our children, by embowering our homes in fragrant flowers, by voting to line the highways with trees and shrubs, and by freely disseminating such knowledge as we may possess or acquire, that others may be encouraged to love and cultivate the flowers, the crowning glory of California.

In conclusion I will say, that it is hoped that we will find it expedient to have assembled in the spring or a year hence a grand floral congress in San Francisco, that will attract people from all over the country to see our remarkable floral products, and hear our own floriculturists discourse, as well as noted floriculturists from several portions of the United States, and we ask that you earnestly coöperate with us in all that pertains to the developing of this important industry in California.

DISCUSSION.

Mr. W. W. Smith: Reference has been made to the productiveness of everything in this State; now florists know how very difficult it is to get seeds of the double petunia; they are only produced by the most scientific seed growers, and then the double ones are fertilized by the pollen of the single ones by the very difficult process of putting the pollen of the single one on to the double one with a very fine camel's hair brush. You send to James Vick, or to any other florist, for the double petunia, and for half a dollar you will get three or four seeds. My wife sent to Mr. Vick for seeds of the double petunia and she got four seeds for 50 cents; she planted them and they all grew, and from them she got a fine lot of seed without any fertilization. I make this statement in order to confirm what the gentleman referred to in regard to the productiveness of most fruits, plants, and flowers in our State.

Mr. Booth: So far as producing the seed of the double petunia, it is no more difficult to produce that seed than almost any other seed of double plants; it simply requires to be done artificially, by the same process that bees and insects produce by the scattering of the pollen. There are very few plants that we can get double seeds from double plants; for instance, in the begonia family, you can get seed of the semi-double, but you can get no seed whatever from any really double plant; they have all got to be done artificially, just the same way as the bees and flies make it in nature.

Mr. Smith: Why is it that the seed of that flower is so very high, if they are so easily raised?

Mr. Booth: Simply because there are so few people who understand the theory, and can produce it.

Mr. Parker: I have been very much interested in the essay read here. I think it is a grand production, and I think one matter we cannot pay too

much attention to, beautifying our own homes. I want to describe an ordinary home in California. I will select a man with probably $15,000 to $20,000, and this man lives perhaps within a quarter of a mile of one of the best railroads in the United States, and has for a great many years. Nature has done a great thing for him and his neighborhood, and as we pass along the road where this man's mansion is, the first evidence we find of a home is a huge pair of bars; boards some of them, or half boards, and part of them broken; that is the magnificent entrance. We step inside of the pair of bars and walk along, and have to look down to see where we step for fear we may make a mistake, for his front yard is inhabited, and with what? The first live creature I saw there one day, was a great big spotted hog who had rooted up the ground—remember this is a man of wealth. Well, we escape the pitfalls and approach the house; we rap at the door, and hear a terrible fluttering around, and it is some time before anybody comes. They have to take hold of the knob of the door at the base, and what is the matter—one hinge of the door is off. Before this we endeavored to look into the window, but we failed in that because the glass of the lower sash of the window have all been broken out and are supplanted by shingles, and bits of boards, and one thing and another to stop the crevices, and as we look up a little distance there are two glasses left, and we see the remnants of curtains that have hung there for years, and from the looks of them they are actually torn from their hangings. The house stands in a beautiful place, but it is right flat on the ground, hardly the height of that step to get into the house. At the rear of the house we see a chimney composed of rocks, sticks, and stones. I suppose there is a fire inside because there is smoke coming out. We pass into the house, a floor uncarpeted and unwashed, perhaps for years. Now, to think that there is a woman there with a family of six children to be brought up among such surroundings; to think that a woman has been imprisoned there in that place and compelled to bring into this world children, to bring them up under these influences; what can we expect of children raised under such circumstances? This picture may be an extreme one, but you will find it throughout different parts of California. There is one little girl in that family, she has the innate desire to be somebody and do something, but she has to battle against the influence of a shiftless and indifferent father and careless mother. In this front yard she has trimmed sticks and raised up a little platform above the pigs, an old box such as they send fruit to the cannery with, and placed there a little scrambling stump of a flower, and preserves and tends, and I believe that is the only redeeming influence that has ever surrounded that girl's life.

And so I feel the force of that saying to-day—that exhibition should be given to encourage the beautifying of our homes in this beautiful country of ours. This is not an isolated case; you can go around the country and find it, particularly among grain growers, not horticulturists, because they are a step in advance. Is it any wonder that boys and girls, as soon as they can get away from the restraints of such homes, will leave and go to the city or somewhere else, we know not where? I believe that the cultivator of the soil, having the fortune to get this beautiful land, should commence a home; if you can't build a house, the first thing to do is to make a home ready to build a house, and suitable for our wives and children to live in; instead of having bare walls, cover them with perhaps a little canvas; plaster those houses, and protect them from the heat, and put on those walls beautiful pictures, and the room with books, and educate our children in this way, and we shall bring up a generation which shall be an honor to those who come here, and then we can keep our sons and

daughters at home. I am glad that in parts of California, particularly in Chico, they are attempting to adopt this plan, surrounding their houses with what is lovely, and when we do this we can make an Eden, a paradise in California, which we have heard so much about. We have paradises in California—I am glad we have them for those we love. I have a golden-haired little child whom I love to surround with all things that are beautiful, and to see her learn to love the flowers and everything that is lovely, and therefore we shall bring to the world something that is a benefit to the world instead of a damage.

Mr. Klee: Mr. Smith in his very interesting essay has referred to medicinal plants. I believe, as he says, that there is considerable of a future to the cultivation of various medicinal plants. The California climate that we speak so much about has a tendency of developing a very strong aroma of the various plants. He says that he disputed the fact that was stated by people that our flowers did not have the fragrance of those of the Eastern States, or other countries. I believe they do have as much, but owing to the often occurring dry winds just at the blooming time, they lose it very quickly, but I think it is there all the same. Whenever we have a change of the wind, and moisture is brought about, their fragrance then becomes overpowering. But there is another class of plants outside of roses and such, and that is the mint family. We have a great many plants of that order, and they are exceedingly rich and aromatic. From those we derive a great many kinds of material oil. In the south of France, and also in the Southern States, there is considerable made out of preparing this material oil. As regards the medicinal plants, there are many that are adapted to our climate which we now receive from other countries. There is one in particular which is a very useful plant and used very largely in medicine; I refer to the Rhubarb. That is a plant that they use enormous quantities of, and I am satisfied that there are many portions of this State where it would flourish. I have had some little experience with it, and from that I can say it is successful in central localities. I think it would pay to give more attention to that, and I agree perfectly with Mr. Smith that we ought to diversify our horticultural products as much as possible, and there may be a good many people that now have gone into fruit culture that will find it is not quite as profitable in that locality as they expected; that they perhaps have got the wrong kind of soil, etc., and who perhaps will turn their attention to such things, liking, as they undoubtedly do, the culture of plants and outdoor life.

Mr. White: I would speak of some of our California native woods for ornamenting our yards and homes. We have in the redwood regions the genuine yew of Europe, and it attains a larger size here than elsewhere, a most beautiful ornamental tree; and, then, perhaps you know that far back there was a cedar discovered in Port Orford which has been used largely for inside blinds, and there is no wood that rivals it for that purpose and general finishing purposes in the finest of dwellings, and it is one of the most beautiful ornamental trees when properly looked after. Only a few miles from National City you will find a rare pine, I believe found nowhere else in the world, which may be made one of the most ornamental of trees. Now the evergreen we use for hedges, the Monterey cypress, is peculiar to that, and we have a pine peculiar to the same section of country, and if you go a little further north a good many shrubs in the hills—the calycanthus, I have it growing in my yard, a beautiful shrub, flowering. Then we have the native nutmeg tree of California, I have it in my yard, one of the most beautiful ornamental trees that we have; I have acacias from Africa and from India; but, sir, I would not exchange that

native nutmeg tree of California for any of these different varieties of trees; then we have a holly growing in these cañons, and the black walnut, and then the laurel is a beautiful tree, and some of the most beautiful and costly furniture ever manufactured in the State of California has been made from that—it bears a very high polish; then I consider the manzanita, if properly looked after, is a pretty shrub—"little apple" is the meaning of the word, and it is essentially a minute apple. I have also the madrone, and it is an exceedingly beautiful tree, and I was greatly astonished at a lady who has spent a number of years in California asking what tree that was. There is a great ignorance among the people who live here of the beauties of our forests. Even the buckeye, if properly trimmed and propagated, is very ornamental; there is nothing that we have in the landscape more beautiful than the buckeye in bloom, with the two varieties, pink and white. Why should we discard these trees and these shrubs? Do we want to beautify our homes in proportion to our climate and in proportion to the beauty of the scenery with which we are surrounded, and with the paradise of nature painted on almost every mountain side? It is painted almost; look at it as you see them all in purple and clothed in gold. Shall our homes be wanting, and not in harmony with the paintings of nature itself? I want our homes to be like so many stars set in this beautiful land, not alone surrounded with flowers and shrubbery and ornamental trees, but to be genuine nurseries of happiness. Oh, what memories come to mind at the very word—home—mirth, singing of children, youth, sacred to every human heart, how sacred they may be made here in California to every glad opening mind, how precious they may become! Do we keep our homes housed with all that is worthy? As fruit growers, as citizens, as dealers in God's most favored land, let us make our homes, keep them to dwell in, spending the years of our life in, and when the last summons comes take our final rest in the higher and broader and better world above.

RESOLUTION OF THANKS.

Mr. Johnston offered the following resolutions, which, after being read, were adopted unanimously:

Whereas, Inasmuch as our business as attendants upon the Tenth Convention of California Fruit Growers is drawing to a close, and as we shall soon disperse to our distant homes, and the incidents of our assembling will be enrolled among the treasures of memory; therefore, be it

Resolved, That we desire to place upon our records some recognition of our indebtedness to those who have extended to us such generous greeting and hospitality, and have ministered so devotedly to the success of our meeting and to our comfort and enjoyment.

Resolved, That to the Chico Horticultural Society we are deeply indebted for the constant and self-denying efforts of its members in preparations and provisions for this convention; that they have furnished us a most convenient and delightful place of meeting; that they have given us excellent facilities for viewing their thriving town and fertile country; that they, assisted by other public spirited men and the beautiful ladies of Chico, have entertained us most lavishly at the complimentary banquet of Thursday evening, and that these and other generous acts we look upon as embodying the true California spirit of hospitality, and we accept them with a true California spirit of thankfulness and appreciation.

Resolved, That our thanks be also tendered to the Sons and Daughters of the Golden West for their thoughtful attention to us, and for their kindly invitations to participate in their festivities.

Resolved, That generally and finally, we express our appreciation of the fact that all promises of welcome outheld us by our associates and friends of Chico and Butte County have been more than fulfilled, and that our coming together has been filled with pleasant experiences and productive of much good to all participating.

APPOINTMENT OF COMMITTEE.

On motion of Mr. Butler it was ordered that a committee be appointed to examine the samples of oil produced before the convention.

REPORT OF COMMITTEE.

The Secretary read the report of the committee appointed to examine a seedling apple, as follows:

To the President and Members of the Fruit Growers' Convention:

Your committee, having examined the seedling apple from Watsonville submitted to them, beg leave to report as follows: We find the apple of the Bellflower type, rather broader at the base, but not so much elongated; resembling in quality that well known variety, except that the acidity is somewhat less in the specimens examined.

JOHN ROCK.
C. W. REED.
B. G. STABLER.

NEXT PLACE OF MEETING.

The Chairman presented the following telegram:

FRESNO, CALIFORNIA, November 24, 1888.

Fresno County Board of Trade extends cordial invitation for next session of convention.

LOUIS EINSTEIN, President.

The Secretary presented invitations inviting the convention to hold their next session at San Diego, and, after discussion, it was agreed that the convention recommend and request the State Board of Horticulture to fix the next place of meeting at National City, San Diego County.

NOMENCLATURE OF FRUITS.

PROFESSOR HUSMANN: I have noticed that, at every exposition and public display made of our fruits, many have been exhibited under the wrong name, and I have seen varieties under three or four different names. I do not know that I am competent to speak of California fruits, as I have only been in the State eight years, and have made the grape my special study, and I know that in the nomenclature of the grape there are many mistakes made. Some examples were mentioned this morning; for instance, we have the well known Napoleon Bigarreau cherry growing frequently under the name of the Royal Anne. Now, there is no such name as the Royal Anne in any of the fruit books. It is a well known variety, and ought not to pass under a wrong name; and there are dozens of instances of that kind, which I hope can be corrected. We all appreciate the difficulty in this State where fruits vary so much in size, and even in shape and color, and I hope something may be done to remedy this defect.

MR. WILCOX: I suggest that a committee be appointed as a standing committee. I brought from my farm some prunes I am unable to get the name of, and if I could get the name, I would be very glad, and I would like to submit it to a standing committee and have them report when they have another meeting, for, as I have twelve hundred trees of this variety, it becomes a matter of importance.

W. W. SMITH: We all know how difficult it is to get fruits by their true name throughout the State. If there is any man that ought to be familiar with the names of fruit trees, it certainly is the nurserymen; but I see in General Bidwell's catalogue, which is distributed in the room now, fruits named incorrectly according to my understanding. I pick up John Rock's catalogue and I find it the same. Who is correct, I cannot say, because we differ so much about the names of those fruits. In regard to prunes the gentleman from Oregon spoke of to-day, one of them is propagated throughout the Pacific Coast under different names, and sold under different names.

These things should not be; there will be confusion as long as such things remain; something can be done with proper steps. While we are originating a great many new varieties of fruit on the Pacific Coast, which is very laudable and should be encouraged, the old varieties, many of them, are improperly named and improperly called on this coast, and I would make a motion that there be a standing committee of five appointed to take this matter in hand and work it up. It cannot be done in a few days, but it can in time, and should be done.

The motion was carried.

COMMITTEE ON COOKE MEMORIAL.

The matter of preparing a suitable memorial to the late Matthew Cooke was brought before the convention and discussed, and on motion the matter was referred to the following committee: Hon. William Johnston, Sol. Runyon, and Mr. Booth.

COMMITTEE ON OLIVE OIL TESTS.

The Chair appointed the following committee to examine olive oil produced before this convention: General Vallejo, Charles Dondero, and B. M. Lelong.

ORANGES IN NORTHERN CALIFORNIA.

DISCUSSION.

Mr. Butler: I think there might be something more than has been said as to the planting of oranges in Northern California. There has been an opinion throughout this State that Northern California is a failure in orange culture on account of the cold last winter, and very many oranges would have been planted last season but for that fact. Placer County sent twenty-five thousand oranges to Los Angeles late last December, and the entire side of a building sixty feet long was covered with oranges, giving them such a slope that they would not fall off, and the people were astonished at the oranges that could be exhibited there at that season of the year, before oranges were ripe. It was a complete revelation to the people of that section of country. I was one day standing in front of the exhibit, and a gentleman came up and said: "Are you connected with this exhibit?" I said I was in charge of it. Said he: "Did those oranges grow in Placer County?" I said they did. Said he: "Did you see the trees from which those oranges came?" Well, his method of putting the question was rather pointed, and it brought me out a little, and I said: "Every orange that you see here on exhibition, every lemon, persimmon, and olive, was grown in Placer County; I have seen nearly every orchard and I know that they were grown there, and within a range of two or three miles from one spot." "Well," he said, "that beats Los Angeles," and the gentleman introduced himself as Mr. Chapman, of San Diego. I make this explanation because I don't care to be quoted as making comparisons; he is the man that made the comparison. We had specimens of fruit there that I never should have allowed to have gone, for I could have gone into one single orchard and, if I had taken every orange on the trees, the product would have been better than the one exhibited there. Oranges won't grow everywhere in Northern California, but there is a certain thermal belt in the foothills where the growing of oranges is eminently practical. I desire to show that it is practicable, the planting of oranges in this section of the State for profit; and then there is a value other than the mere actual profit, more

than the intrinsic value of growing orange trees for fruit—there is a certain ornamentation that it gives that is valuable. There is no doubt that the principal attraction of Southern California has been its orange groves, and I claim if the same number of orange groves existed in this section of the State, and this country had been advertised and called to the attention of the world, that there is no reason why the country should not have become as thickly populated as Southern California. It is well known that nearly all of the deciduous fruits raised in California is in the northern rather than in the southern part of the State, and from the Sacramento district is a very large percentage of all the deciduous fruits sent out of California. There are certain sections that make specialties of certain things, and I think this State will run in specialties in the future—there are certain places where peaches flourish, and can be shipped to better advantage than others. Now, it will be found the best policy to plant such fruits as do the best in that section, and in those places most remote from railroad transportation it will be best to plant fruits to can or dry. Now, in certain places all along these coast ranges, in what is called the thermal belt, we have found places where oranges will grow with almost as much certainty as deciduous fruits, and there has not been a failure of oranges in this locality described for the past ten years.

Mr. Klee: I desire to ask Mr. Butler how the budded fruit in Placer County compares with the seedling oranges, and if they will stand the cold?

Mr. Butler: It is the universal impression there that the seedling will stand the cold and frost much better than the budded fruit. I think the Mediterranean Sweet has suffered more than most other kinds. With very few exceptions there has been no loss of trees in that section, though in some places the wood was cut back to a considerable extent, but where the trees were planted at the proper elevation, not particularly exposed to frost, the tree has fully recovered, and beyond expectation; and next year we shall not realize that there was any unusual cold last winter.

Dr. Peck: My seedling trees were not injured at all; on my naval trees the leaves were mostly killed, but not otherwise injured. On my Mediterranean Sweet the new wood was killed and in some cases the tree.

Mr. Klee: I ask the question because I think it is a very pertinent one to know what varieties are best adapted to this climate. If, as claimed, they have seedlings which are much hardier and bear well for years and years good crops of good oranges, it would be wise, I think, to plant those, and the sooner they go about that the better it will be.

MISCELLANEOUS.

TOMATO CULTURE.

Essay by Emory E. Smith, San Francisco.

The tomato (*Lycopersicum esculentum*), is a native of South America. It was introduced into England in 1596, where it was grown for ornamental and medicinal purposes, as the "love apple." Parkinson, in 1629, first speaks of its being used as a food in the hotter parts of South America.

Italy was the first of the European countries to use it as a vegetable, but was soon followed by France and England, though as the climate of the latter country is not favorable for its outdoor culture, it is grown chiefly under glass.

As late as about fifty years ago there were only four varieties cultivated in the United States, viz.: two with cherry-like fruit, one red, the other yellow, and two with small pear-shaped fruits of similar colors. Most of the luscious varieties which now grace our tables are introductions of quite recent date, and there still remain examples of the unreasonable prejudice, which for so many years retarded the improvement and general use of the tomato.

At first the fruit was only eaten generally after having been pickled or preserved, but it has gradually risen in public estimation, till at the present time it has such considerable importance, not only for use in the raw state, but for canning, catsups, etc., that many thousands of acres are devoted to its culture.

The tomato is so peculiarly adapted to growth in California that on many of the foothill slopes of Los Angeles, Ventura, and Santa Barbara Counties, it has become naturalized, and acres of them may be seen growing luxuriantly, though the plants receive no culture, and frequently no water, except through the atmosphere, from the germination of the seed till their death. Though these wild plants retain their vigor and size, the fruits have all returned to the original cherry forms, retaining, however, a most luscious flavor.

Tomato culture has not received the attention in California that its importance merits, and in consequence our store shelves are loaded down with eastern canned and bottled goods, while good fresh tomatoes frequently come so high in our retail markets that many are debarred from using them.

The type of tomato at present sought after grows on a stout bushy plant, which ripens early an abundance of medium sized, bright red, purplish, or yellow fruit, with small seeds, thin smooth skin, and symmetrical outline. As no material advancement has been made in varieties for several years, it has been thought that perfection had been reached, but this is doubtful.

The seed should be saved only from the finest specimens, growing on vines of good habit, and which have produced only fruit of regular size and symmetrical outline. Great care should be taken to keep the seed in a perfectly dry place, as they are very susceptible to moisture. After the seeds have gone through the winter season in the wild state, I have calculated that only one in two thousand germinates, while under cultivation at least 85 per cent would grow.

The seeds may be planted almost any time during the winter or early spring, in prepared sheltered beds or frames, according to the locality. Scatter them broadcast, cover lightly, and keep the soil moist, not wet. When the second leaves develop pick off the plants into shallow flats, with room for fifty or one hundred plants in each. These can readily be carried and distributed about the field when ready for planting. The varieties most generally grown in California are the Trophy, Early Conqueror, and Livingstone's varieties: Perfection, Favorite, and Beauty.

The ground should be thoroughly prepared, flat or ridged, with sufficient room allowed for horse cultivation. It should not be too rich, or vines will be produced at the sacrifice of the fruit. I have been the most successful when settling the plants firmly with water in the evening or on cloudy days, and have had the best success when planting was done on the sides of double furrowed ridges.

Irrigation is only advised in extreme cases, as ordinarily, intelligent cultivation will be all-sufficient. If, however, irrigation has been once commenced, it must be kept up to get good results. The warmer and drier the soil, within reason, the quicker the fruit will ripen.

Bright red is the color most preferred for marketing purposes. The greatest care is necessary in picking and packing. In removing the fruit from the vines, it should, for the home market or for canning, be well colored; for distant markets, the diffuse color should just be discernable. In any case they should not be bruised or injured at the stem. For any market they should be carefully assorted in size and color, and packed with the apex outward in small boxes.

For home use it is well to train the vines upon low slanting trellises. Tomatoes can readily be grown from cuttings when kept close with bottom heat. Sometimes Chinese gardeners in the southern counties, on the approach of frost, cut off the vines and cover up the stubs with old sacks until all danger from cold has passed. It is well to nip out the tops of the plants before blooming, to make them stout, and perhaps by retarding their vigor produce fruit sooner.

Here a recess was taken until seven o'clock P. M.

EVENING SESSION.

[President Cooper in the chair.]

COMMITTEE ON NOMENCLATURE.

The Chair appointed the following standing committee on nomenclature of fruit: Professor George Husmann, W. W. Smith, E. J. Wickson, W. G. Klee, and B. M. Lelong.

REPORT OF COMMITTEE ON OLIVE OIL.

MR. LELONG: Mr. President, your committee appointed to consider the olive oil shown here, after due consideration have come to the conclusion that there was not sufficient time to make proper examinations and report to this convention, and we recommend that one person be selected by this convention, another by Mr. Dondero, and that these two persons select a third party, and that the samples be turned over to the committee so named to report thereon, and that the report when made be published.

On motion, the report of the committee on examination of olive oil was adopted, and Mr. B. M. Lelong was selected as the representative of the convention on such committee, and Mr. Dondero being present named P. C. Rossi, of San Francisco, as his representative.

DISCUSSION ON PEAR BLIGHT AND CURL LEAF.

MR. GRAY: During the noon recess some of the gentlemen went over to the Rancho Chico and examined some pear trees, which I thought had the regular pear blight, and some of them thought it was not and others thought it might be that. I would like to hear from them, for if it is the pear blight it will be a very serious thing for the pear interest. The first

I noticed of this was last year. The end of the twig would turn black, and after leafing out the leaves would turn black, and also the bark from six inches to two or three feet. We pruned off and burned the blighted part, and tried to keep up with this, thinking it would stop; and I was in hopes that it would not occur again this year, but it has, and some have been quite seriously affected. I am told the same thing began in New York, about fifteen or sixteen years ago, and the pear growers there trimmed until they cut the trees all away, and the pear interests were ruined in about three years.

Dr. Kimball: Is there very much of that disease in the orchard?

Mr. Gray: Considerable, and in two or three orchards quite remote from each other.

Mr. Klee: The only symptoms similar to what I have seen to-day, I have seen at Mr. Kells place near Yuba City, though they seem somewhat different, and I afterward saw them on my own trees turned black in a few days, and a portion of the limbs dies, but Mr. Kells tells me that the whole tree did not die, but only a portion of it. In this case there were quite large limbs that had died, and the young shoots showing that they might be affected. I am not sufficiently familiar with all these different blights, because there are more than one in the Eastern States; the so called fire blight and sap blights; and still, perhaps, another form; and it is one of the most dangerous and troublesome things that we have to deal with. They have, as Mr. Gray states, made great havoc in the Eastern States, and there has been absolutely no cure brought forward. One of the reasons why the Keifer and LeConte pear have been propagated in the Eastern States is, because they have been pronounced blight proof.

Mr. Kells: In regard to what Mr. Klee has stated: in my orchard the leaves seem to blight first, turn black, and then they would break off after a week or ten days, and then the limbs soon lose their color. The blight seems to start in the leaf first, and it went over some two or three of my trees, almost leaving the fruit hanging, so that it was exposed to the sun; but this year they have borne a crop of pears and apparently are as healthy as they ever were. This season I have not seen any in my neighborhood.

Mr. C. W. Reed, of Sacramento: I went over to examine the trees spoken of by Mr. Gray, and I do not think it is anything more than a sap blight caused by the extreme hot weather, and not the dreaded pear blight they have in the Eastern States. I have often seen the same effect in my own orchard and cut them out and never have seen anything more of them.

Mr. Wickson: I would like to say that my observation agrees with that which Mr. Reed has described. I am quite sure that it is not the so called fire-blight which they fear so much in the East; I can see no indication of that whatever; it seems more likely to be the sour sap-blight, as it is called, than anything else I know of. I am quite sure it is not the worst form of blight.

Mr. Gray: There was a young Bartlett pear orchard where the trees were very thrifty and it would not seem possible that the heat of the sun could burn them, where the most damage has been done—a young tree that is growing fast does not burn by the heat of the sun, and especially on the shady side of that tree. I am in hopes that Mr. Reed and Mr. Wickson are right; I am very much afraid they are not, for I notice that on the shady side of the tree just as much damage was done as on the other side, and just on parts of the tree, one or two limbs affected and the rest all healthy; if the hot sun does it why does it strike one limb and not the balance? There is one point as to pruning, as to which I should like to hear some discussion from nurserymen and those who have had experience

setting out young trees—that is, the pruning of the tree in the nursery preparatory to digging. Some nurserymen trim up from the bottom a foot or two, or something of that kind, and if we cut off our trees up to the height of twelve or fourteen inches before setting out, then the question is, should those new limbs be cut so that those buds will start properly. I think that this is a very important question; sometimes they start and make a good growth right away and other times they don't seem to—if you get a tree two or three feet high the buds will all start to the upper part of the tree, but cutting it down to twelve or fourteen inches sometimes the buds don't start.

PRUNING NURSERY STOCK.

Dr. Kimball: I think that is owing to the nurserymen having treated their trees improperly when they are young in the nursery; they break off too quick the buds as they are starting, in order to produce a trunk. I think the peculiarities of tree life are that as they come out of the ground, they put out buds and leaves and will produce shoots in almost any emergency unless they have been rubbed off.

Mr. Thompson, of Fresno: In my county they adopt the plan of cutting our trees back to two feet in height. Along in June when our trees get about eighteen inches high, I go along and cut the tops off of the entire nursery from one end to the other, and that stops the extra growth; and my early trees dug this year are equivalent to two years old because of the way they have grown as they come out of the nursery.

Mr. Gray: If you were going to plant a tree a foot in the ground, how would you treat it in the nursery?

Mr. Thomas: I would trim off everything above ten inches, and keep the stock in from ten inches down, and when it gets up to about fourteen inches pinch your terminal bud off, and you can have your lateral limbs as you wish to have them. If you let that center growth run up eight or ten feet in height your lower lateral limbs are poor, and you won't have any lower lateral limbs on it until it is about three feet high. The thing is to pinch back and form the lateral limbs at the point you want to have them.

Mr. Kells: Do I understand, Mr. Thomas, that by forming the laterals on the stock you will gain a fruit crop sooner than by pruning the trees?

Mr. Thomas: I think I would. I think I could gain a year on Mr. Smith's method in three years by starting them right in the nursery.

Mr. Smith: Mr. Thomas' method amounts to about the same as a method I described here last night, with this exception, and that is, in taking the trees from the nursery, picking, and shaping them while setting out. Those laterals he speaks of are likely to get broken and bruised, and the results are not quite so good; with that exception, as he says, he gains a year's growth by going in and pinching it or topping the young trees and forcing those laterals out at about the very height a person wants, topping them a foot or eighteen inches as the case might be, but my experience will be to let the trees grow in the nursery a year old without any lateral limbs and let the bud develop as plump and as healthy as possible, and in handling the trees from the nursery and setting them out, do it as carefully as possible, not cutting off buds below where you want to cut off the tree, and in handling the tree handle it above where you want to cut it off and leave the buds below all undisturbed. Then when the tree is set out and it starts to grow in the spring, the buds near the top are all ready to start, and any below that pinch off, and that leaves a bunch of leaves on the top of the tree to protect it when the tree has no limbs to protect itself

with, and in this climate the heat is very liable to burn the body of the tree. A good idea is to set up a shake on the southwest side of the tree and stick it in the ground to shade the body of the tree and avoid sunburn. One thing I would like to call attention sometimes where trees are allowed to grow very thick in the nursery, they will not form any buds for a foot or fifteen or eighteen inches high, except a few right around the bottom near the cicatrix or point of union between the bud and the stock. We find this frequently the case, and then it is utterly impossible the first year to form the head of your tree, but some of those buds that come out near the bottom will start and grow and above that is the dead stock sticking up there, and all a person can do is to let this branch that starts out grow during the season, and next winter cut off the dead tree down to that and make your tree out of this branch that starts up from the bottom; but care must be taken that the sprout does not start below the bud, for then you will have a seedling. You cut away the dead tree and train up that branch that is left and then treat it as you would a year old tree, and all that is lost is a year's growth on the tree.

Mr. Rock: In our business we are governed by what our customers want. We clean them out about six inches above the ground, and sell them that way, and the buyers afterwards train them to suit themselves. If we sell a lot of trees to go to Washington Territory or Oregon, we sell them four feet high, and here or in Vacaville, a foot above the ground; for Watsonville or Santa Cruz, about three feet high.

Mr. Gray: The question was as to trimming the laterals when a tree wants to be cut off about fourteen inches high.

Mr. Rock: We generally leave them on, unless they get too large, when we shorten them in. We generally clean up about six inches above the buds, in the season, until we see whether we have the seedlings or a budded tree that we sell to other people.

Mr. Hatch: Do you ever top your trees in the nursery row?

Mr. Rock: No, we never do, unless it is the second year; when we don't sell them we top them about two feet high.

Dr. Kimball: In different parts of the State they have different methods of treating and pruning their trees. I am acquainted more or less with Santa Clara, Santa Cruz, Contra Costa, and Sonoma Counties, and my own county, Alameda. The custom in Alameda, with very few exceptions, is to train trees so as to get them about three feet high. Some men come with the habits of the East, and cut the trees for four feet high, and shape the trees so the wind will not sway or bend the limb. In our country around the bay we have no extreme heats as the people of the Sacramento Valley, and in consequence of that, and to facilitate the cultivation of the ground, they prune to get something more as they like it, of a tree shape, instead of a shrub shape, starting it from the ground. I know it is a question that some of our orchardists are beginning to consider quite seriously, as to whether it would not be a saving of ladders and labor in picking and pruning, to start the trees nearer the ground, say eighteen inches; many of our most experienced orchardists are now cutting them from eighteen inches to two feet, especially with cherries, as cherries make more of an upright growth; but the apple and pear are almost universally trimmed up to two feet, and many places to three feet and a half, giving a better opportunity in plowing to get nearer the tree, and also rendering it a little more convenient in passing around the trees with wagons or carts, and gathering the fruit or carrying off brush. So far as my opinion goes, I believe in the country around the bay in this humid climate it is better and more economical to train the tree up two or three feet instead of cut-

ting it down so low, as is a matter of necessity here. Dr. White calls attention to the matter of the curled leaf, stating that some of the trees within his observation have had the curled leaf this year, and not last year, and vice versa, and asking for information and explanation as to that matter.

Mr. Gray: Up in this part of the country we have very little curled leaf. I was at Mr. Shinn's orchard at Niles two or three years ago, and he mentioned a number of varieties of peaches that he could not raise with profit on account of the curled leaf that with us rarely if ever curl at all, except once in awhile when we have a very wet winter and the leaves start quickly and make a fast growth, but never enough to injure the crop at all, and the varieties that curl down on the bay do not curl at all here.

Mr. Hatch: How about the success of the apricot in this vicinity?

Mr. Gray: We think it succeeds very well indeed, and it will stand much heavier soil, as you all know, than the peach, and our sandy loam produces very fine apricots; the Moorpark, which is our favorite, does better with us than it does in many other sections of the State; owing to the drier atmosphere perhaps they ripen more evenly and are very large; perhaps Mr. Hatch will remember taking a ride with me to our Moorpark orchard when he and Mr. Buck said there was not the like in the State. It is one of our chief fruits, and a fruit that brings in as much money as anything else we can plant.

Mr. Klee: I am satisfied that the curled leaf is caused or flourishes best when the atmosphere is damp—dampness and sudden changes, and if we could retard the development of the trees many times, it might prevent the curled leaf from doing the trees any harm. I have read that they do that in France by protecting them, but of course that is out of the question. An experienced and successful fruit grower in San José, who used successfully, for the purpose of killing scale insects, their so called sal soda and whale oil wash, maintains that ever since he has been using that wash he has been free from the curled leaf, and his explanation is, that his trees are being somewhat retarded, and for those seasons, at least, has escaped the cold spell that often comes in springtime, and as other orchards in his vicinity have been affected, there seems to be something in it, and it may be worth trying by others.

Dr. Kimball: Around the Bay of San Francisco there are very many varieties of peach we cannot raise in consequence of the tendency to curled leaf. Some sixteen or seventeen years ago I had a peach orchard of a number of varieties, some of which curled very badly, and one variety was inclined to curl all the time; and it chanced that one tree escaped trimming, and it almost entirely escaped the effects of the curled leaf; so the next year I did not trim any of those trees, and let them develop, and let the sap out—we usually cut our peach trees back every year nearly two thirds of its growth, and in so doing take probably two thirds of the leaf surface; and when we leave the whole of the leaf surface to draw the sap of the tree, we find that it will be an expenditure that would check the excessive growth. I found those trees were not absolutely cured, but were very much improved; and let them grow until they leaved out thoroughly, and until the peaches were about as large as hazel nuts, and then I went to work and had those trees trimmed. I did that as long as I kept the trees in our orchard, and never lost a crop of fruit after that on those trees from the curled leaf. I mention that as a possible cause—the excessive pushing of the sap into the extremities of the trees, and, as the consequence, a tendency to chill from our peculiar conditions of atmosphere and cold nights. I think that same thing will apply to trees in Sonoma County.

Mr. Reed: I want to confirm Dr. Kimball's idea. Where trees are badly subject to curled leaf, to refrain from pruning them until after the weather has become thoroughly settled is the best remedy I have seen as a preventive. The curled leaf is, in my judgment, only the bursting of the sap vessels, caused by severe pruning and changes in the weather.

Mr. White: I think excessive pruning has not been practiced on some of the trees; it is constitutional with them. It has been stated that it occurred just after a change in the weather. I have watched quite closely the trees to which I was alluding, last summer, and there was just about the same amount of leaves every morning, or every two or three days, that were curled at the same time before, running from May until about the last of August, and then the curled leaf disappeared entirely from that orchard and there came out the growth strong, and vigorous, and new. I went into the orchard the day before I came here, and the growth was as large as most growths ought to be in the whole year; the fruit had been ripened and taken away, and the limbs that had been forced out before the curled leaf entirely ceased have been forced forward. It leaves me entirely at sea. I am not convinced that the theory as to the change of climate is true, and yet I have no better theory to offer, and still it doesn't satisfy me.

Dr. Kimball: I have had some little experience in planting peach trees, and planting trees and the harvesting of fruit. Now, we find the unfortunate condition that a physician does, diagnosing a case of disease and ascertaining the cause; and I know of no other way in treating trees than to go to work by the same mode of reasoning as you would in making out the case of a sick person. Many years ago I had occasion to visit that old veteran peach grower, John B. Crawford, in the northern counties of New Jersey, the original grower of the Crawford peach, which is the predecessor of the Foster and other varieties. The old gentleman was then seventy-seven years old. That year there were no peaches in New Jersey, which had already become celebrated as a great peach-growing State. He could not account for it, and went on to narrate to me the methods used in planting peach trees. He said: "I used to plant three hundred acres of peaches; they were always healthy and produced in the greatest abundance. We made peach brandy; it was one of the most remunerative occupations we could pursue in the days gone by, but we can't raise peaches any more. I have taken trees from the nursery and planted them and given them all due attention;" and from fifty acres of land he had never sent one basket of peaches to the New York or Philadelphia market; that he had taken virgin soil, where trees had always grown in great perfection, and they would not mature peaches, and before they got to be four or five years old they would all die with the curled leaf or yellows. I was not much of a horticulturist in those days, but I went to New York, and could not but reflect on what the old gentleman told me, and was studying in our physiology, giving particular attention at that time to the vitality of the human race, and the idea occurred to me, as he had told me that they had planted at that time all seedlings—they did not bud their fruit in those days, but had been raising their trees that way between thirty-five and forty years; and the idea occurred to me that the same laws that applied to the human race might be just as true as regards trees, and so the next time that I went over to New Jersey I suggested it to the old gentleman, and learned more thoroughly their methods of pruning their trees, as to the way they planted their seeds, and when those trees died they used to plant new orchards and budded those varieties right back again, and so they kept on for generations, until the tree had lost its vitality, and the pits, instead of

having good thick meats, were nothing but a thin film, and as a consequence when the trees came out of the ground they were inclined to take on all forms of disease; and so I suggested to him that if they would send down to southern Illinois or to North Carolina and get fresh peach pits, that is pits from seedling trees, and then commence again, that I believed they would get good fruit; and that winter several nurserymen and parties that were interested in growing trees—for every man that was in the orchard business raised his own peach trees—sent down and procured pits, and they had good peaches there until recently, and this is the first time I recollect that they were troubled with the yellows. I recollect when I first began to satisfy my curiosity in raising trees, not expecting to sell them, that all the trees I produced in the nursery came up good and strong, and that every tree when it was budded brought forth a good strong tree; but I found before I discontinued the business that a quarter and sometimes half of the trees would be totally unfit for budding, so one time I met Mr. Hixon, a commission merchant in San Francisco, and got him, when traveling in Tulare County, to get some pits, and he sent me up several sacks, and from those pits I raised perfect stocks, and every one of them brought a fine and vigorous tree. I apprehend that it is this in-breeding—budding into the stock that is produced from the pit of the same variety of tree—that produces this inclination to take on all these different forms of disease.

Mr. White: I have seen Crawfords taken from the nurseries about San Francisco to the Sandwich Islands, and there cultivated just as we cultivate them here, and they would make a large growth, and I have eaten the fruit from the trees and found that the nature of the Crawford peach was changed so that you wouldn't know it, and the form was also changed to a pear shape, but I saw none of the curled leaf or any other disease, which surprised me very much. The changes of the climate there are as great as it is in San Francisco during the spring and summer, except when you get up on the mountain side—but I mean in the region of Honolulu in the lower altitudes, where they would naturally cultivate a fruit orchard—the peach was changed so much that I didn't know it, and the pulp and limbs are altogether different; it was a series of knots one upon the other. Now, this leads me to the conclusion that while climatic influences make great changes, I could not assign the curled leaf as the result of a change of climate, as several have done.

Mr. Klee: Most all of us know that the Chinese contend that the curled leaf is due to a distinct species of fungus. Now, these varieties of fungus diseases must have certain conditions to deal with, a certain temperature to start and a certain atmospheric condition to flourish in. It seems to me easy to show why certain portions of this State are not troubled with a curled leaf and others are. The germ is brought on the tree if they are taken from the place where the curled leaf is, but the conditions favorable to the development of that fungus does not exist, consequently it does not develop; that maybe is the reason why it did not develop in the Sandwich Islands.

Mr. Hatch: I would like to give one little bit of evidence that points toward it being caused by excessive sap: The fact that some of the young twigs come out so rapidly that they are flattened, and that there, just at the extremity of the branch, the leaves on those twigs will curl badly even when they don't on the balance of the tree. Those little laterals are numerous, especially on some varieties, where it is the only part of the tree that curls. This rapid growth seems to be an abnormal growth, where not only the leaves curl, but the gum exudes.

Mr. Thomas, of Fresno: I have seen, under very badly affected pepper trees, grass affected the same way, indicating that there was a fungus growth, and some of the drippings on to that grass affected it the same as the leaf above.

A Delegate: I wish to make a suggestion. I have noticed the trees most troubled with the curled leaf were those that were cut back the most, and I attribute the curled leaf to the stoppage of the sap that becomes sour in the tree. Right across the road from where I live is a little nursery that was planted there, mostly of apricots and peaches to sell. They never were budded or grafted either, and they were there for three years, and some of them just as they were planted in the row are thirty feet high, and they bear every year, but of course the fruit is good for nothing; and there never has been a curled leaf on those trees. Perhaps the gentlemen can tell why. The experience I had with the curled leaf tells me that we prune too much. It stops the sap, and the warm weather comes on afterwards and sours the trees, and there is not top enough left to take up the surplus of the sap, and of course it collects at the end of the limb, and curled leaf is the consequence.

Mr. Kimball, of San Diego: I will ask what is the longevity of the peach, seedling or budded? There is now at the old Mission San Luis Rey peach trees which were there in 1832, and I am informed by Mr. L. Arguello that there are trees in Lower California over eighty years old, seedling trees bearing continuous crops every year.

Dr. Kimball: That goes to show, as we know, that the Spanish planted only seedlings.

Mr. Hatch: It is hard to tell in California what age a peach tree would attain and bear good crops, if it was properly taken care of. On the place I first purchased in Suisun Valley there were some peach trees at that time thirteen years old; the first year I was there, with the light pruning such as we commonly did at that time, there was fuzz and skin enough to cover the seeds; I had heard some years before that ashes were good in Europe for peach trees; I cut the tops off very severely, and that fall and winter I sprinkled two or three buckets of ashes about those trees; there was not a great deal of fruit on that year, but it was very fine, and those trees remained there for about twelve years under my care, and they always produced fine peaches. There were two Morris White and two Tillotsons, fine, healthy trees, and they were finally taken up to make the rows straight in the orchard, and not because they had at all deteriorated; the last two years the two Tillotson trees furnished thirty-seven boxes of good peaches.

Mr. Smith: There are now grown in Vaca Valley peach trees that were set out in the winter of 1856–7. They were budded trees of the Early Crawford, Strawberry, Old Mixon Free, and Old Mixon Cling—about fifty trees of those four varieties—and they are now bearing a good crop on them this year, and the fruit was fine and nice. Some of those trees are dead on the southwest side from severe burning, but they were trimmed up about five feet high, so that a man and a horse can walk under them. Every one of those trees are badly sun-burned on what is called the two o'clock side, but they bear good crops, and bid fair to bear crops for many years; that shows conclusively that in California, at least, the peach tree is a long-lived tree.

Mr. Hatch: As to sun-burn, I have seen trees planted without burning nearly as high as it was in the nursery, and if they have any reason they want to keep it that way, and want to keep it from the effects of the sun-burn. I have used for quite a number of years a simple remedy: I make a wash of whale oil soap and water, one pound of whale oil soap to the gal-

lon, and whiting, I use lime, and paint it on the side towards the two o'clock sun. A tree that leans a little towards the sun at that time of the day won't scald; I don't know whether it will if exactly perpendicular, but if it leans a little bit the other way it will; it may be necessary to repeat that, if a strong rain should come on, but it is very easily done. It is not in the way of cultivation, and is much simpler than tying straw or sacks or anything of that kind. In regard to branching trees low or high, I would like to say that I find there is less difficulty to plow close to them if they are branched low than if they are branched even that high, for if you have low lateral limbs growing that hang down they are more apt to be in the way than if they grow up and make their umbrella-form, and you are not as apt to harm your tree in working with horses, for I don't care how straight the tree is, if there is nothing to keep the horse a little bit away, the average man, in working horses, will accomplish the feat of hitting it with the whiffletree and knock off the bark. We have had the greatest damage to trees in this way, to say nothing of occasionally there will be a limb left where the hames will hit it. Top hames ought not to be used in an orchard.

A Delegate: Can you tell why it is that our Bartlett pears have blossomed twice, and some three times, this fall, some with the second crop have been brought in this fall, and what effect, if any, will it have on next year's crop?

Mr. Hatch: That is no uncommon thing; in fact, it is quite usual for Bartlett pears to have some few pears on a healthy, vigorous tree as a second crop. Those blossoms, though, come in bunches from the ends of that year's growth, instead of coming from a perfect bud. About any blossoms coming later than July or August, I should think it would be on account of neglect. I say neglect, from the fact that I saw one cherry orchard almost in literal full bloom in October, and the circumstances which caused those blooms were: the ground had been plowed once, the trees had not been hoed, the earth had dried, and the trees had produced their crop, the leaves had fallen, and they were ready to perform their work for the next spring, and rains came in September, which caused those buds to swell and bloom.

Mr. Gray: I do not quite agree with Mr. Hatch on that; I have seen this year's pear trees bloom good crops of pears, and the ground perfectly hoed and cultivated and harrowed, and also peaches raised quite a heavy crop, and are now holding up the second crop of peaches, although a very different type from the first peach. We picked several boxes from the second crop of Bartlett pears, and as for my own eating I wish they were all second crop; no core, and a very fine flavor. There are some trees that blossomed so full that it seems to me there could not be any blossoms left for the next spring. I do not think it was neglect, or anything of that kind.

ADJOURNMENT.

The President: Our labors for the present are about concluded. I will therefore call upon Dr. N. R. Peck to close the session by benediction.

At the conclusion of Mr. Peck's remarks the convention adjourned sine die.

B. M. LELONG,
Secretary.

APPENDIX.

Reports of the Leading Fruits, Varieties, New Fruits, and General Observations throughout the Fruit-Growing Sections of the State.

UP TO JANUARY 1, 1889.

LEADING FRUITS GROWN THROUGHOUT CALIFORNIA.

REPORTS OF THE LEADING FRUITS, VARIETIES, NEW FRUITS, AND GENERAL OBSERVATIONS THROUGHOUT THE FRUIT-GROWING SECTIONS OF THE STATE.

ALAMEDA COUNTY.

Report of J. L. Beard, Centreville.

The leading fruits grown in this district are: cherries, apricots, plums, prunes, and pears. The leading varieties are:

Pear.—Beurre Clairgeau, Beurre Hardy, Glout Morceau, Winter Nelis, Bartlett, White Doyenne.

Apple.—Newtown Pippin, Alexander, Jonathan, Yellow Bellflower, R. I. Greening, Smith's Cider, Baldwin.

Peach.—Nichol's Cling, Sellers' Cling, Muir, Foster, Smock's Late Free, Crawford's Early, Crawford's Late.

Cherry.—Royal Ann, Black Tartarian, Yellow Spanish, Elton, Governor Wood, Burr's Seedling, May Duke, Cleveland Bigarreau.

Plums and Prunes.—Jefferson, Hungarian Prune, Purple Prune, Washington, Reine Claude de Bavay, Yellow Egg, Coe's Golden Drop, Petite Prune, Bulgarian Prune, Bradshaw, Columbia.

Report of H. K. Carter, East Oakland.

The leading fruits grown here are: cherries, plums, prunes, and apricots. The leading varieties are:

Cherry.—Royal Ann, Centennial, Governor Wood, Burr's Seedling Rockport.

Plums and Prunes.—Washington, Green Gage, Yellow Egg, Reine Claude de Bavay, French Prune.

Apricot.—Royal, Blenheim.

Report of C. S. Haley, Newark.

The leading fruits grown in this district are: pears, apples, peaches, apricots, cherries, plums, and prunes. The leading varieties are:

Apple.—Early Harvest, Gravenstein, Rhode Island Greening, King, Yellow Bellflower, White Winter Pearmain, Yellow Newtown Pippin.

Pear.—Bartlett, Winter Nelis, Beurre Clairgeau.

Peach.—Strawberry, Early Crawford.

Prune.—Fellenberg, German, Petite D'Agen, Hungarian.

Plum.—Washington, Bradshaw, Jefferson, Coe's Golden Drop.

Cherry.—Black Tartarian, Royal Ann.

Small Fruits.—No large extent of small fruits planted; not because they cannot be grown here, but the cost of labor has deterred many from going into this business, and only enough are generally grown for family use.

Report of H. Curtner, Harrisburg.

The leading fruits grown here are: apricots, prunes, peaches, and almonds. Our locality is unquestionably the home of the wine grape.

Report of A. P. Crane, San Lorenzo.

The leading fruits grown here are: cherries, plums, prunes, apricots, pears, apples, and currants. The leading varieties are:

Apple.—Red Astrachan, Alexander, Fall Pippin, Rhode Island Greening, Newtown Pippin, Spitzenberg, Smith's Cider, Norton's Melon, White Winter Pearmain, Yellow Newtown Pippin, Yellow Bellefleur, Swaar, Jonathan, Gloria Mundi.

Cherry.—Vanskyke, Rockport Bigarreau, Graffion, Burr's Seedling, Napoleon Bigarreau, Worder's Early Black, Black Tartarian, M. De Mazel, Knight's Early Black, Black Eagle, Black Republican.

Plum.—Early Golden Drop, Yellow Egg, Washington, Jefferson, Imperial Gage, Coe's Golden Drop (Silver Prune), Columbia, Quackenboss, Royal Hative, Japanese, Victoria, Prince of Wales, Huling's Superb, Purple Gage.

Prune.—German, French, Italian, Spanish, Bulgarian, Hungarian, Silver, Fellenberg.

Peach.—Hale's Early, Alexander, Yellow Crawford, Salway, Red Cling, Orange Cling, Morris White.

Pear.—Dearborn Seedling, Bartlett, Onondaga, Beurre Hardy, Beurre Clairgeau, Doyenne du Comice, Duchesse, Beurre de Anjou, White Doyenne, Beurre Diel, Vicar, Winter Nelis, Howell, Doyenne d'Alencon, P. Barry.

Small Fruits.—Currants are largely grown, most of the product of the State coming from this township. Blackberries and raspberries limited.

Report of James Shinn, Niles.

The leading fruits grown here are: apricots, prunes, cherries, pears, plums, and peaches. The leading varieties are:

Pear.—Bartlett, Winter Nelis, Beurre Clairgeau, Duchesse d'Angouleme, White Doyenne.

Peach.—Foster, Early Crawford, Mary's Choice, Susquehanna, Honest Abe, Seller's Cling, Nichol's Cling, McKevitt Cling, Piquet's Late, Salway, Muir.

Cherry.—Does well on all but very wet or heavy land. The leading varieties are: Royal Ann, Black Tartarian, Governor Wood, Elton, Burr's Seedling, Rockport, Centennial.

Prune.—French, German, Silver (Coe's Golden Drop).

The fruits I would recommend for planting are:

Cherry.—Rockport, Burr's Seedling, Royal Ann (if planted young).

Apple.—Holland Pippin, King, Alexander, Yellow Bellflower, Yellow Newtown Pippin.

Peach.—Seller's Cling, Nichol's Cling, McKevitt Cling, Susquehanna, Piquet's Late, Salway.

Pear.—Bartlett, Duchesse, Beurre Clairgeau.

Plum.—Coe's Golden Drop, Early Cue, Ickworth.

Prune.—Coe's Golden Drop (or Silver), French.

Apricot.—Blenheim, Royal.

Report of Juan Gallegos, Mission San José.

The leading fruits grown here are: olives, almonds, walnuts, figs, and grapes. We grow mostly all of the other fruits, but they ripen later than most other sections.

Report of C. W. Dearborn, Pleasanton.

The most profitable fruits grown in this district are: grapes, pears, olives, and almonds. The fruits that are chiefly grown are: grapes, apricots, almonds, Bartlett pears, and Mission olives. Apples are not much grown; peaches, Early Crawford; French and Hungarian prunes; Smyrna and California Purple figs; Rose of Peru, Muscat, and White Verdel grapes; Princess, or Lady Finger, and Languedoc almonds.

AMADOR COUNTY.

Report of J. Violet, Ione.

The leading fruits grown here are: apples, pears, cherries, prunes, peaches, and figs. The leading varieties are:

Apple.—Red Astrachan, Early Harvest, Alexander, Yellow Bellflower, Twenty-Ounce Pippin, Baldwin, E. Spitzenberg, Wine Sap, Northern Spy, Violet's, Jonathan.

Peach.—Hale's Early, Briggs' Red May, Foster, Early Crawford, Late Crawford, Salway, Susquehanna, White Cling, Orange Cling, Bilyeu's Late.

Pear.—Bartlett, Winter Nelis, Vicar, Seckel, Easter Beurre.

Cherry.—Governor Wood, Black Tartarian, Napoleon Bigarreau, Early Guigne.

Plum.—Bradshaw, Columbia, Washington, Kelsey, Purple Duane, Damson, Green Gage.

Prune.—French, Silver, German, Fellenberg, Grosse Prune d'Agen.

Fig.—White, Mission.

Report of J. Northrup, Lancha Plana.

The fruit business in this locality is fairly prosperous this season, with the exception of grapes; the dry season and intense heat cut the crop short at least one half. I consider this locality as certain for a crop of fruit as any in the State. I have lived in this vicinity twenty-two years and there has been only one failure of a crop in that length of time. We make a specialty of peaches, and claim that we can not be beat in the State. Oranges are also a success in this vicinity. The premium oranges at the District State Fair held at Ione last month, were grown here. The leading fruits grown here are peaches, pears, and apples. Of small fruits, blackberries and strawberries.

NEW PEACH.

We have a new peach which originated here; it is named the "Queen of the West." It is a freestone; it is a beauty; a large white peach with a red blush, extra fine flavor, ripens just after the Late Crawford. The tree is a good grower, leaf does not curl, good for canning or drying.

The leading varieties of peach, which is our leading fruit, are: Alexander, Briggs' Red May, Hale's Early, Early Crawford, Foster, Muir, Late Crawford, Susquehanna, Morris White, Heath Cling, Orange Cling, and Salway in large proportion.

Report of G. L. Tubbs, Ione.

With our experience, which has been of but about three years (our orchard, a portion being six years old), and what I can learn of others in the vicinity, and taking our present market, no cannery nearer than Sacramento, would settle on the peach, apricot, and prune as being the most profitable, inasmuch as they can be dried and prepared for market at the orchards. Will remark that the Royal and Peach apricot both grow well on our red soil or upland, which has always been considered suitable only for grapes in the fruit line. The Petite Prune also thrives well. We have about an equal number of trees of each on the same soil, four years old, and are fully equal to the growth on our black loam this year same age.

NEW FRUITS.

We have here the following which are new:

Edgar's Snow Peach claims to be excellent; matures middle of September. Also, peach called *Ford's Seedling*; also matures about middle of September.

A new *prune* named the *Gruly*, about the shape of the French, but three times the size. And also an apricot called the *Gruly*, large, and matures three weeks earlier than any other here.

Leading Varieties.

The following are the leading varieties grown here:

Apple.—Early: June Red, Red Astrachan, Early Harvest. Autumn: White Astrachan, Yellow Bellflower, Fall Pippin, Rhode Island Greening, Santa Clara King. Winter: Spitzenberg, Baldwin, Yellow Newtown Pippin, Smith's Cider, Wine Sap, White Winter Pearmain, also a variety called the Mann.

Peach.—Freestones: Alexander, Hale's Early, Early Crawford, Late Crawford, Day's Yellow, Jones' Seedling, Susquehanna, Salway, Hollin's Free. Clingstones: Orange Cling, Lemon Cling, Heath Cling, Salt Lake Cling, Chinese Cling.

Pear.—Bartlett, Winter Nelis, Dearborn Seedling, Madeline, Duchesse D'Angouleme. Would recommend Madeline for our local market, and Bartlett as one of the best for all purposes.

Cherry.—Knight's Early Black, Black Tartarian, Elton.

Plum.—Quackenboss, Columbia, Duane's Purple, Green Gage, Coe's Golden Drop, Blue Damson, Bradshaw; also St. Catherine, which is highly recommended as one of the best for drying, properly classed with the prune.

Prune.—Hungarian, Petite (French), Silver, German.

Fig.—Large Purple, Brown Ischia, White Smyrna, Common California. The Smyrna sent out by the Bulletin Company, as genuine, has not proved a success here as yet.

Nectarine.—Great Stanwick, Boston, New White, also Hardwicke, large pale green, last of July.

The fruits which I would recommend for planting in this district are:

Peach.—Of the various choice varieties for canning and drying purposes.

Prune.—Petite and St. Catherine.

Apricot.—Royal and Peach.

Also grapes of the best table varieties, and on our red upland soil.

BUTTE COUNTY.

Report of J. Woods, Pentz.

The leading fruits grown here are: citrus fruits, raisins, grapes, olives, French prunes, apricots, and peaches. Our climate is well adaped for citrus fruits and raisin making.

The leading varieties are:

Peach.—Governor Wood, Alexander, Early Crawford, Late Crawford, Heath Cling, Orange Cling, Lemon Cling, Old Mixon.

Apple.—We have many varieties of apples in the foothill region, but none do very well, as the climate is too warm. At an elevation of from one thousand five hundred to two thousand five hundred feet on the mountain sides just above us, all varieties of apples do finely.

Pear.—The following varieties do very well, and are the leading varieties: Early Madeline, Bartlett, Beurre Hardy, Beurre d'Anjou, Seckel, Winter Nelis.

Plum.—Coe's Golden Drop, Washington, Jefferson, Green Gage, Blue Damson, Yellow Egg, Red Egg, General Hand.

Prune.—French, Silver, Fellenberg, German.

Fig.—White Adriatic, Brown Turkey, White Smyrna, California Blue.

Walnut.—English, Black.

Olive.—Redding Picholine (California), Mission.

Orange.—Seedling, Navel, Med. Sweet, Malta Blood, St. Michael, Jaffa, Tardiff, Homosassa.

Lemon.—Sicily, Seedling, Belliar Premium.

Nectarine.—Boston, Hardwicke, Stanwick.

Report of F. T. Birk, Forbestown.

The leading fruits grown here are: apples, pears, peaches, prunes, apricots, plums, and table grapes. Walnuts do very well. We are not in the citrus belt, and for that reason oranges and lemons are omitted.

CALAVERAS COUNTY.

Report of E. H. Schaeffle, Murphy.

The following are the leading varieties generally grown about here. The apple, however, excels all others, when the codlin moth is kept in subjection:

Apple.—Baldwin, Alexander, Winesap, Red Astrachan, Yellow Bellflower, Rhode Island Greening, Spitzenberg, Red Cheek Pippin, Swaar, White Winter Pearmain, Porter, Hubbardston's Nonsuch.

Peach.—Briggs' Red May, Hale's Early, Early Crawford, Late Crawford, Foster, Salway, Orange Cling, Lemon Cling.

Pear.—Bartlett, Seckel, Flemish Beauty, Keiffer's Hybrid (no good), Beurre Clairgeau, Easter Beurre.

Cherry.—Royal Ann, Black Oregon, Black Tartarian.

Plum.—Peach Plum, Columbia, Silver Prune, Hungarian Prune.

Almond.—Paper Shell.

Apricot.—Royal, Blenheim.

Report of J. W. Cook, Burson.

Our leading fruits are the peach, almond, fig, plum, grape, and berries of all kinds. The leading varieties are:

Apple.—Astrachan, Early Harvest.

Pear.—Bartlett.

Plum.—Green Gage, Wild Goose, Yellow Egg.

Peach.—Early Crawford, Late Crawford, Queen of the West, Hale's Early, and all varieties seem to do well.

NEW PEACH.

There is a new peach here called the "*Queen of the West;*" very large, white meat, and a fine peach in every respect. Ripens with the Late Crawford. Most varieties of fruit do well as far as tried. The country being new, of course many kinds are not thoroughly tested as yet.

Report of F. W. Greene, West Point.

This is a splendid district for apples; they keep splendidly, and can't be beat for fine flavor and keeping qualities. They are mostly sent to Stockton for market. They net here about 1½ cents per pound in bulk or in boxes. If we had a railroad this could be made a splendid paying business, equal to an orange grove.

The fruits I would recommend for planting are:

Apple.—Rhode Island Greening, Newtown Pippin, Spitzenberg. All late kinds that are good keepers, and if of red color sell best.

Small Fruits.—Strawberries.—Sharpless, Captain Jack, and Monarch of the West. *Blackberries.*—Lawton and Crandall's Early. Small fruits are grown here on a small scale. We have only a home market.

CONTRA COSTA COUNTY.

Report of P. M. McCosker, Moraga.

In this locality the land is used almost wholly for grain and stock raising, very few orchards of any kind having been planted. The kinds that are growing have always done well with very little care. Small fruits and berries of all kinds grow splendidly where tried, except grapes, which grow thrifty, but with a bad flavor. Walnuts promise to do very well. There are many in this district grafted on native California stock, and are growing very thrifty. The English walnut has been so worked, and have commenced to bear.

Report of R. Hastic, Clayton.

This is a new fruit district. Apricots and pears do very well, and are the leading fruits grown. We are, however, a little too far from the San Francisco market; at present we have to haul to shipping point, a distance of twelve to fourteen miles. About six miles to the west of us they are planting fruit trees of all kinds by the square mile.

Report of M. Hall, Alamo.

This locality is well adapted to the growth of most all, excepting tropical fruits. However, as this section is new, considerable fruit is grown, but only for home use. There are many favored localities where citrus fruits can be grown.

Report of George Wiley, Danville.

The leading varieties of fruits are about as follows:

Apple.—Early Harvest, Early Strawberry, Gravenstein, Red Astrachan, Fall Pippin, Jonathan, King of Tompkins County, Baldwin, Rhode Island Greening, Esopus Spitzenberg, Yellow Newtown Pippin, Smith's Cider, Nickajack, Vandevere (N. S.), White Winter Pearmain, Yellow Bellflower, Hubbardston's Nonesuch, Northern Spy, Swaar, Lady's Sweeting, Lady Apple, Grimes' Golden Pippin.

Peach.—Briggs' Red May, Alexander, Hale's Early, Strawberry, Crawford's Early, Crawford's Late, Morris White, Royal George, Salway.

Pear.—Bartlett, Bloodgood, Dearborn's Seedling, Doyenne d'Ete, Madeline, Beurre Diel, Beurre Hardy, Beurre Clairgeau, Easter Beurre, Beurre Brettoneau, Duchesse d'Angouleme, Seckel, Winter Seckel, P. Barry, Forelle, Winter Nelis, Souvenir du Congress.

Cherry.—Belle d'Orleans, Napoleon Bigarreau, Black Tartarian, Elton, Gov. Wood, Knight's Early Black, Belle Magnifique, May Duke.

Plum.—Coe's Golden Drop, Damson, Green Gage, Imperial Gage, Reine Claude de Bavay, Royal Hative, Victoria, Washington, Yellow Egg, Kelsey.

Prune.—Prune d'Agen, Fellenberg.

Fig.—California Black, Black Ischia, Adriatic, Smyrna.

Nectarine.—Downton, Hardwicke, New White.

Report of Dr. J. Strentzel, Martinez.

Apple.—On northerly slopes bear fine fruit, not much infested with codlin moth.

Peach.—Obtain a large growth; superior fruit.

Pear.—Bartletts excel in size and drying qualities.

Cherry.—This fruit does well.

Plums, prunes, almonds, and figs cannot be surpassed. *Table grapes* are in demand. The slopes on highest hills produce the finest wine grapes, and as soon as there is a remunerative demand assured, the purple grapes will rapidly displace the other varieties.

Report of General Theodore Wagner, Orinda Park.

This place is in Upper San Pablo Valley, and in a direct line from Berkeley, in an easterly direction, only four and one half miles distant. There is a wagon road from Berkeley to this place, by which the distance is eight miles. The following are the leading varieties grown here:

Pear.—Bartlett, Beurre Clairgeau, Winter Nelis, Duchesse, Fall Butter, Vicar of Wakefield, Flemish Beauty.

Apple.—Alexander, Red Astrachan, Swaar, Northern Spy, Yellow Bellflower, Spitzenberg, Seek No Further, Rhode Island Greening, Virginia Greening, White Winter Pearmain, Yellow Newtown, Murkley Red.

Peach.—Alexander, Early Crawford, Lemon Cling, Orange Cling, Snowflake, Durant, Smock's Late Free, Strawberry.

Plum.—Yellow Egg, Washington, Coe's Golden Drop, Green Gage, Cherry.

Prune.—French, German.

Fig.—White Adriatic.

Cherry.—Royal Ann, Black Tartarian, Governor Wood.

Apricot.—Royal, Blenheim.

The fruits I would recommend for planting here are about as follows: Only late varieties of apples and peaches; Bartlett, Clairgeau, and Winter Nelis pears; Royal Ann, Black Tartarian, and Oxheart cherries; French and German prunes, walnuts, pecans, olives, and almonds.

COLUSA COUNTY.

Report of Albert N. Thompson, Arbuckle.

The excellent soil, grading from the light sandy loam to the heavy adobe, together with the favorable climate of this locality, have rendered grain raising too profitable a following for the advancement of the fruit industry. Enough of the several varieties have been cultivated, however, to prove that fruits in the main will grow and produce bountifully. The dry, heated winds of our valley are not favorable to the growth of the citrus fruits, though where somewhat protected and well cared for, moderate success is assured. Small fruits thrive best where irrigation is practiced, yet thorough cultivation overcomes, in a great measure, the want of water. With the exception of the grape, no especial care has been taken as to varieties; hence, the difficulty of naming them.

Report of Thomas Nichols, Orland.

The land around Orland is chiefly gravelly loam with a mixture of clay, varying greatly in quality and composition. Stony Creek runs one and one fourth miles north of this vicinity. The first attempt to grow fruit on the plains in this vicinity commenced about ten years ago. There were, before then, only three or four small orchards in this vicinity, which had been planted convenient to water on creek bottom lands. It was then generally thought that trees could not be grown, nor fruit produced on these dry plains, without irrigation. Since then quite a number of orchards and small vineyards have been planted, and a good deal of fruit—good, excellent flavored fruit—has been produced, although the seasons have been getting drier and drier ever since the wet season of 1877–78, and little and in many cases no irrigation has been practiced.

The soil and climate seem especially adapted to the apricot; the trees grow thrifty and bear well, especially the Royal; the Moorpark, after it has borne a year or two, seems to need summer pruning to make it bear. Almonds do well, so does the peach. Plums and pears bear enormously, but they are apt to gum and gradually decay, and borers kill most of them off in seven or eight years.

Without irrigation the early kinds of fruit only can be depended upon. Winter flooding appears to be all that is needed, except for strawberries and blackberries, which need more irrigation. Sunburn and borers during our dry seasons greatly damage our trees. We have great facilities for winter and spring flooding, and are now taking steps to avail ourselves of them. Certain success will then be assured.

Report of L. F. Moulton, Colusa.

The leading fruits grown here are: the peach, prune (French), plum, Bartlett pear, almond, cherry, and the Red Astrachan apple. Other varieties of apples do well if planted near the river, as the water seems to kill the codlin moth.

The varieties of fruits I would recommend for planting are:

Peach.—Early Crawford, Foster, Susquehanna, Muir, Wager, Salway, Early Tuscan Cling, Edward's Cling, Orange Cling, McKevitt's Cling.

Prune.—Petite or California Prune, Prune d'Ante, St. Catharine.

Plum.—Yellow Egg, Coe's Golden Drop, Columbia, Peach Plum, Pond's Seedling.

Cherry.—Centennial, Napoleon Bigarreau, Black Tartarian.
Pear.—Bartlett.
Fig.—Purple and White Adriatic.
Nectarine.—New White and Hardwicke.
Walnut.—There are several trees of the Praeparturiens grafted on the California Wild stock and are doing well.

Report of E. E. McDaniel, Butte City.

Very little attention has been given to fruit raising in this neighborhood in the past. Farmers have given all their attention to the cultivation of wheat. The few small orchards that have been planted have had poor cultivation and no irrigation; consequently, in dry seasons the trees suffer and sometimes perish, except on bottom land, where the same is overflown in the winter. On such lands, where the flood is shallow and soon passes away, the growth of the trees and the size and beauty of the fruit is marvelous.

There is a small peach orchard, planted in the spring of 1885; the trees are now twenty feet high, and, as they have never been pruned, they are covered with long branches from the ground up, and have already borne two crops of fruit, so heavy as to necessitate the propping up of the limbs to prevent their breaking. I think the peach and apricot particularly suited to this kind of bottom land, and cannot fail to be very profitable. Apples, pears, and plums also do exceedingly well and bear heavy crops. This is in bottom land that floods shallow in the winter; but I think the outside land, with proper cultivation and irrigation, would do perhaps quite as well.

INYO COUNTY.

Report of Wm. Walker, Plancha.

Apple.—Are planted extensively; nearly all the leading varieties; trees just coming into bearing.
Peach.—Does well; I think of the finest flavor.
Plum.—Inclined to overbear; all the leading kinds planted.
Pear.—Principally Bartlett.
Cherry.—But few planted; appear to be a failure.
The fruits I would recommend planting in this district are: apple, peach, nectarine, pear, almond, prune, and all kinds of small fruits. We cannot grow citrus fruits.

Report of A. C. Harney, Lone Pine.

Peaches, apples, nectarines, plums, and grapes seem to do remarkably well. I think it is the home of the apple and of the wine grape. The Yellow Bellflower apples do best with us; peaches do well, but only early varieties. The Bartlett pear is about the only one planted. Only a few cherry trees have been tried. Small fruits have been planted very little, only on a small scale. Table grapes do very well.

EL DORADO COUNTY.

Report of R. M. McKay, Coloma.

The most profitable fruit grown in this locality is the peach, followed by the plum, apple, and pear. The following are what I would recommend for planting in this locality:

Peach.—Commodore Cling, Strawberry Cling, Oregon Cling, Albright Cling, Orange Cling, Late Salway.

Plum and Prune.—Duane's Purple, Grosse Prune d'Agen, French Prune, Silver Prune, Kelsey, Washington, Green Gage.

Apple.—Spitzenberg, Steele's Red Winter, Yellow Newtown Pippin, Summer Queen.

Pear.—Bartlett, Winter Nelis, Easter Beurre, Beurre Hardy.

Nectarine.—Boston, Large White, Stanwick.

Apricot.—Royal, Blenheim.

Fig.—White Smyrna, White Adriatic.

Table Grapes.—Flame Tokay, Rose of Peru, Muscat, Black Malvoise, Prince Albert.

NEW FRUITS.

The Commodore Cling, and Nicholl's Cling peaches are considered new here.

Report of B. M. Cope, Indian Springs.

Apples, peaches, pears, prunes, plums, and all kinds of cherries grow well as high as Indian Diggings, which is at an elevation of three thousand three hundred feet, and are of the finest flavor, and free from moths and worms. This vicinity is twenty-five miles from a railroad, and people plant only for their own use. A few are starting in to make it a business. If any one was here at this time, September eighth, it would astonish him to see apple, pear, and plum trees loaded with the largest and juiciest of fruits, and to see grapevines loaded with large bunches.

Report of E. Mortensen, Pilot Hill.

The leading varieties of fruits grown in this district are about as follows:

Apple.—Steele's Red, Spitzenberg, Swaar, Roxbury Russet, Yellow Bellflower, Rhode Island Greening, Alexander, Baldwin.

Peach.—Early Crawford, Late Crawford, Early Tillotson, Orange Cling, Strawberry Cling, Lemon Cling, Heath Cling, Briggs' Red May.

Pear.—Bartlett, Winter Nelis, Duchesse d'Angouleme.

Cherry.—Oxheart, Black Tartarian.

Plum.—Peach Plum, Washington, Green Gage, Coe's Golden Drop, Duane's Purple, Damson, Egg Plum.

Prune.—Gros Prune, French, German, Hungarian.

Fig.—Black and White.

The varieties I would recommend for planting are about as follows:

Apple.—Steele's Red, Spitzenberg, Rhode Island Greening, Yellow Bellflower.

Peach.—Early Crawford, Late Crawford, Orange Cling, Strawberry.

Pear.—Bartlett, Winter Nelis.

Plum.—Egg, Green Gage, Duane's Purple, Peach Plum.

Prune.—Gros, French, Hungarian.

Table Grape.—Flame Tokay, Rose of Peru, Muscat of Alexandria.

Nectarine.—Yellow.

Cherry.—Black Tartarian.

FRESNO COUNTY.

Report of James Grant, Fresno Flat.

The foothills and mountains of Fresno Flat have an altitude of from one thousand nine hundred to four thousand feet, but grow as fine apples as can be found in the United States. A variety which prospers above all others, is the Yellow Newtown Pippin, which does not shrink, keeps in perfect condition until the first of July, and always commands a good price.

Mr. James M. Harris (altitude two thousand nine hundred feet), is the largest grower in the mountains. He has eight hundred bearing trees sixteen years old, and one thousand seven hundred young trees. He reports the Yellow Newtown Pippin first, then the American Golden Pippin, Winesap, and Baldwin, in their order.

James Grant (altitude two thousand eight hundred feet) has four thousand five hundred trees, of which three thousand are Yellow Newtown Pippin just beginning to bear. He is trying the Winesap, White Winter Pearmain, Baldwin, Esopus Spitzenberg, Bellflower, and various summer varieties. The White Winter Pearmain ranks next to the Yellow Newtown Pippin. He is also planting a vineyard of fifty acres of White Muscats for raisins. His experience has proved that apples, pears, peaches, almonds, and berries all grow well without irrigation. By constant cultivation his trees during the dry season have made as rapid growth as could be desired.

John T. Corin has the best tended orchard in Fresno Flat. He has in all about three hundred trees, chiefly apples and pears. His orchard is always well cultivated and kept clean. From a few pear trees planted a few years ago he gathered thirty boxes of as delicious fruit as man ever ate.

Wm. H. Center, of Fresno (elevation one thousand nine hundred feet), has from four hundred to five hundred trees, chiefly apples. His crop this year will be one thousand boxes; Harris' crop, four thousand boxes; Corin's crop, four hundred boxes; Grant's crop, one hundred boxes.

The capacity of these hills to produce good fruit is extending every day. There are no insect pests here yet. The great enemy to be encountered is spring pest, which, so far, has injured the crop one year in five.

There is a seedling peach in Grant's orchard which promises well. It is as yellow as Crawford's Early, without any stain at the pit.

Every variety of fruit that could be expected to prosper at this latitude, is being tried. This orchard district is on the direct road to the Yosemite.

Report of A. P. Almagrin, Fresno.

Almost every variety of fruit can be grown in this district, but the fruits grown the most successfully are the Muscat raisin grape and the peach. The best varieties of the latter to plant are, in my opinion, the Early and Late Crawfords, Foster, and Salway of the Freestones, and Orange and Lemon Clingstones. I think Muscat grapes and peaches are the most profitable fruits grown in this district, which is, however, peculiarly adapted to the Muscat grape.

Report of W. A. Sanders, Fresno.

Apples and pears that have been introduced from the extreme south of the Atlantic States are uniformly successful, growing well, producing abundantly, and retaining unimpaired all of their good qualities. Vari-

eties brought from Northern or Eastern States are deteriorated in quality by our long, hot summers; several of the best eastern apples being entirely worthless here.

The following are the leading varieties grown:

Apple.—White Winter Pearmain, Yellow Newtown Pippin, Black Warrior, Ben Davis, Shockley, Romanite, Chattahooche, Equinatlee.

Peach.—Briggs' Red May, Early Crawford, Alexander, Susquehanna, Foster, Sanders', St. John, George IV, General Lee, Chinese Cling, Thurbur, Lemon Cling, Brandywine, like Crawford's Late, only twenty days later, Traber Cling, fine flavor, many of them one pound each, ripe in October, Bilyeu's Late, Gibson's Late, large, fine, heavy bearer.

Pear.—Dearborn, Bartlett, Winter Nelis, Duchesse d'Angouleme, Beurre Hardy, Easter Beurre, Le Conte.

Cherry.—Governor Wood, Elton, Black Tartarian.

Fig.—Brown Turkish, California Black.

Prune.—Hungarian, German, French.

Plum.—All the "Gages," General Hand, Sanders' Hybrid, Duane's Purple, Wild Goose, Shropshire Damson, Brill, DeCaradeuc.

Apricot.—Royal, Blenheim.

NEW PEACHES.

Fink's Cling, and Traber Cling.

HUMBOLDT COUNTY.

Report of Jackson Sawyer, Table Bluff.

No varieties of fruit will do any good unless protected in the summer from the north winds. I use for a windbreak native spruce and Monterey cypress, both of which give good satisfaction. The soil is upland and has a southern slope, and is about three miles from the ocean. Fruit grown for home consumption and the surplus sold. The following varieties are growing here:

Apple.—Early Harvest, Red Astrachan, Sweet Pearmain, Gloria Mundi, Tolema Hawkin, Rhode Island Greening, Vandevere, Golden Russet, Fall Pippin, three varieties of Russian. I have a seedling that is a fairly good apple.

Peach.—Early Crawford, Late Crawford, Salway, Foster.

Pear.—Butter, Clapp's Favorite, Bartlett.

Plum.—Green Gage, Bradshaw, Weaver, Yellow Egg.

Prune.—Silver, French.

Apricot.—Royal.

Small Fruits.—Nearly all varieties of small fruits do fairly well. Raspberries grow eight feet high, bearing well; mostly for home use; no inducement to grow more, as there is no market.

Report of Dr. O. S. Phelps, Blocksburg.

Careful observation shows that several of the varieties of winter apples, known as such in the Eastern States, and proving to be desirable near the coast, five to ten miles, are only fall apples in this locality (Southern Humboldt). The following would come under this head: Rhode Island Greening, Baldwin, Northern Spy, Yellow Bellflower. While the above develop the highest flavor, fine size, and abundant yield, they seem to all intents

and purposes only fall apples. Many others are grown, but the above are the leading varieties.

Some experiments in handling at time of gathering, which will be made the subject of a later communication, may modify the above.

Owing to the fact that we have no facilities in shipping fruit, we cannot say much as to profit, only that for our home market, which is quite limited at present, all the varieties named are profitable. But with a railroad, putting us into communication with San Francisco, our opinion is that winter apples would lead in profit, for the following reasons: Very high quality; late keeping; could be put on the market in March and April; freedom from insects; heavy bearing; vigor of trees; no irrigation.

The following are the leading varieties grown here:

Apple.—Winter varieties: White Winter Pearmain, Yellow Newtown Pippin, Vandevere, Ben Davis, Jonathan, Swaar, Jeniton. Fall varieties: Northern Spy, Yellow Bellflower, Rhode Island Greening, Baldwin. Summer varieties: Red Astrachan, Sweet Bough, Early Harvest, Late Harvest, Gravenstein, Chenango Strawberry.

Peach.—Crawford's Early, Crawford's Late, Lemon Cling, Early May, Hale's Early, Salway, Red Cling (on trial and growing well), Arkansas Traveler, Hyne's Surprise, Foster, Muir.

Pear.—Bartlett, Seckel, Winter Nelis, Vicar of Wakefield, Dearborn's Seedling.

Cherry.—Black Tartarian, Governor Wood, Elton, Royal Ann, May Duke.

Plum.—Washington, Yellow Egg, Yellow Gage, Imperial Gage, Bradshaw, Damson.

Prune.—French, Silver, German, Hungarian.

Fig.—Mission.

Apricot.—Royal, Blenheim.

Report of Geo. E. Shinn, Eureka.

The fruits which grow to best perfection here are: the apple, pear, plum, prune, and the cherry. These are grown with profit, and will in all probability be the chief fruits grown. As far as I am enabled to learn, it seems mostly experimental with any other large fruits. The peach is not at home near the coast, only about two varieties maturing. Farther back in the mountains some very nice peaches are grown, but nothing like system has ever been introduced into fruit culture.

VARIETIES IN CULTIVATION.

Apple.—Early Harvest, Red June, Red Astrachan, Gravenstein, Sweet Bough, Baldwin, Yellow Bellflower, Jonathan, E. Spitzenberg, King of Tompkins County, Lawver, Red Edwards, Rhode Island Greening, Roxbury Russet, Swaar, Vandevere, Yellow Newtown Pippin.

Peach.—Alexander, Briggs' Red May, Governor Garland, Crawford's, Hale's Early, Mountain Rose.

Pear.—Bartlett, Buerre Giffard, Beurre Clairgeau, Buerre d'Anjou, Flemish Beauty, Keiffer Hybrid, Vicar of Wakefield, Winter Nelis.

Cherry.—May Duke, Governor Wood, Rockport Bigarreau, Black Republican, Black Tartarian, English Morello.

Plum.—Coe's Golden Drop, Columbia, Green Gage, Kelsey's Japan, Washington, Large Yellow Egg.

Prune.—Hungarian, German, Silver, Petite.

FRUITS RECOMMENDED FOR PLANTING.

Apple.—White Winter Pearmain, Early Harvest, Red Astrachan, Yellow Bellflower, Gravenstein, Holland Pippin, Baldwin, King of Tompkins County, Rhode Island Greening, Swaar, Vandevere, Yellow Newtown Pippin.

Peach.—I would recommend, for the fog district, Hale's Early, Governor Garland, and Alexander; for the mountains, any strong bearer that the hot weather would injure the least.

Pear.—Bartlett, Winter Nelis, Flemish Beauty, and the Beurre family. Nearly all kinds of cherries grow to perfection, and bear enormous crops.

REMARKS.

Plums grow here as if this was their native home, and I am satisfied any kind will bear abundantly. Trees have to be propped on all sides to preserve the limbs. Prunes do the same as plums; as to quality I am not prepared to say. The Petite prune and the Silver prune seem to take the lead. Small fruits are grown very extensively, but only for the home market. All kinds do very well.

KERN COUNTY.

Report of C. Brower, Bakersfield.

Little attention has been paid thus far to fruit raising in our county. With one or two trifling exceptions, the trees and vines now growing here were planted experimentally or for family use only, and although marked success has attended almost every effort, and our fruits, for size, beauty, and excellence, stand unexcelled and scarcely equaled, our comparative distance from market and the policy of discouragement from the Southern Pacific Railroad Company, has prevented the spread of this industry, and directed the attention of our people more generally toward alfalfa and stock raising, for which our climate and soil with an abundance of water at command for irrigation, render our section peculiarly adapted. With the advent of competing lines of railroad now pointing this way, however, this condition must change, and our county take its place where it properly belongs, among the fruit-growing and raisin-making sections of the State. Owing to circumstances as above stated, fruit growing has not been pursued in our county for profit to any extent as yet. The most promising fruits, however, may be stated to be: George's Late and Early peaches, and Bartlett pears, and also Winter Nelis pears for shipping and canning, and appropriate varieties of peaches, apricots, nectarines, plums, prunes (especially d'Agen), figs, and raisin grapes (especially Seedless Sultanas).

The leading varieties grown here are:

Apple.—Yellow Newtown Pippin, Smith's Cider, White Winter Pearmain, Astrachan, Yellow Bellflower, Gloria Mundi, Sour Bough.

Peach.—George's Late Cling, Late Crawford, Morris White, Honest Abe, Alexander, Orange Cling, Old Mixon Free.

Pear.—Bartlett, Winter Nelis, Seckel, Easter Beurre, Duchesse d'Angouleme, Flemish Beauty.

Cherry.—Governor Wood, Elton, Black Tartarian. Cherries are not prolific bearers in our warm climate.

Plum.—Coe's Golden Drop, Washington, Bradshaw, Yellow Egg, Peach, Shopshire Damson.

Prune.—Petite Prune d'Agen, German.

Fig.—California Black, White Adriatic, Turkish Brown.
Nectarine.—New White, Boston, Red Roman.
Apricot.—Peach, Royal, Moorpark. Another similar in size and general form to the "Peach," name not present to mind.

LAKE COUNTY.

Report of Nathan Graham, Upper Lake.

The leading fruits grown here are apples, pears, prunes, and peaches. Figs are grown only to a limited and experimental state. Other fruits, excepting citrus fruits, do remarkably well, but have only been tried to a limited extent.

LASSEN COUNTY.

Report of J. M. Steinburger, Long Valley.

Apples, peaches, plums, and pears are the leading fruits grown here. Peaches are the most profitable. Cherries and apricots do well, but are very little grown. Small fruits are not grown to any great extent, owing to lack of water.

LOS ANGELES COUNTY.

Report of George Rice, Alhambra.

The planting of fruit trees the last season was much greater than for several years. The speculative tendency turned to the more substantial, and the result was as stated above. The indications, not only for the coming season, but for some years to come, are in favor of planting many new orchards, and the establishing of canneries and fruit driers.

Of course, orange growing is our principal industry here in Alhambra, on account of the suitable character of the soil, climate, and the abundance of water.

It has only been twelve years since the first orchards were planted, and our territory is hemmed in by large ranches devoted to grapevines and grain, therefore limited. Over one hundred carloads of citrus fruits were shipped from here the past season.

FRUITS RECOMMENDED.

I would recommend the planting of oranges and lemons, as the most profitable, although we are threatened with that awful pest, the cottony cushion scale, but by due diligence, and by no orchardist attempting to plant more than he can take care of, I do not see but what any person can plant oranges and make it pay, even with the scale bug to fight.

FRUITS CHIEFLY GROWN.

The fruits chiefly grown here are oranges and lemons, although quite a good many Bartlett pears are grown; also wine grapes.

VARIETIES RECOMMENDED.

Orange.—Washington Navel, Seedling, Malta Blood, Valencia Late, St. Michael, Satsuma, Tangerine.
Lemon.—Eureka.

FRUIT TREES, LEADING VARIETIES IN THE DISTRICT.

Apple.—White Winter Pearmain, Yellow Newtown Pippin, Red Astrachan.

Peach.—Late Crawford, Early Crawford, Salway, Susquehanna, Lemon Cling, Heath Cling.

Pear.—Bartlett, Winter Nelis.

Plum.—Washington, German, Coe's Golden Drop.

Prune.—French, Silver.

Fig.—White Adriatic, Brown, Smyrna (Bulletin).

Apricot.—Royal.

Small Fruits.—Kittatinny blackberry, Cuthbert raspberry, Monarch of the West strawberry (early), Sharpless strawberry (medium). During the season past, there were taken to Los Angeles from Alhambra, twelve tons of blackberries, fourteen tons of raspberries, five tons of strawberries.

Table Grapes.—White Muscat, Rose of Peru, Flame Tokay, Seedless Sultana, White Sweetwater, Black Hamburg, Black Ferrara.

Report of J. E. McComas, Pomona.

The leading fruits of this district are oranges, lemons, limes, apricots, prunes, figs, plums, pears, and the olive. All these fruits do well in this section.

Small fruits are quite extensively grown, and more territory is being set out every year; in fact, that industry is rapidly on the increase.

Report of B. O. Clark, Pasadena.

The orange and lemon, apricots, peaches, and prunes have all paid well where properly cared for, and the Adriatic fig is destined to be valuable. All fruits do well on the highlands at base of Sierra Madre Mountains, but there has not been any well directed effort made in fruit growing the past two years, many orchards having passed into the hands of speculators who have allowed them to go to weeds; but we still have some good young orchards, which are just coming into bearing and promise to be profitable to their owners. There will be more attention given to fruit growing in future.

FRUITS CHIEFLY GROWN.

Orange, lemon, apricot, peach, apple, prune, grapes, and olives. The oldest Redding Picholine olive trees in the State grow here and have proved themselves unfit for the California grower, being small fruit and shy bearers.

FRUITS RECOMMENDED FOR PLANTING.

Orange, lemon, olive, fig, apricot, peach, prune, winter apples, small fruits, including the guava; soft shell walnuts on some land especially suited, and the citron in limited quantities.

NEW FRUITS.

A new seedling cling peach fruited here this season, which I believe will be very valuable. It is yellow, very high color and flavor, very smooth, round, fine shape, ripens just after Orange Cling, and in every way superior to that variety.

FRUIT TREES, LEADING VARIETIES.

Apple.—Red Astrachan, Early Harvest, Rhode Island Greening, Gravenstein, Yellow Bellflower, Yellow Newtown Pippin, White Winter Pearmain, Ben Davis, Nickajack, Skinner's Seedling.
Peach.—Early Crawford, Late Crawford (the latter not reliable), Foster, Salway, Heath Cling, Orange Cling, Lemon Cling, Smock, Bergen's Yellow.
Pear.—Bartlett, Winter Nelis.
Plum.—Green Gage, Blue Damson, Washington.
Prune.—Hungarian, French.
Fig.—White Adriatic, Brown Smyrna.
Apricot.—Royal.

Report of Dr. O. P. Chubb, Orange.

The precarious condition of our orange orchards, owing to the ravages of the red scale, and of our Muscat vineyards, owing to the foreign vine disease, renders this present report less reliable than it would have been two or three years ago, but we propose to replace the vineyards, and to some extent the orange orchards, with the best varieties of canning and drying fruits, supplemented with small fruits for home markets. If the gas process proves effective against the scale pest, we shall stick to orange growing for greatest profit.

LEADING FRUITS.

Oranges, apricots, muscat grapes, peaches, pears, and French prunes.

FRUITS RECOMMENDED FOR PLANTING.

Washington Navel, Mediterranean Sweet oranges, Royal apricots, Lemon Cling peach, White Winter Pearmain and Greening apple, Winter Nelis and Bartlett pear, French prune, Mission olive, English and Soft Shell walnut, strawberry, guava, and loquats.

FRUIT TREES.

The leading varieties in this district are:
Apple.—White Winter Pearmain, Yellow Bellflower, Ben Davis, Rambo, Rhode Island Greening, Gravenstein.
Peach.—Early Crawford, Late Crawford, Early Strawberry, Early York, George IV, Orange Cling, Lemon Cling.
Pear.—Bartlett, Winter Nelis, Beurre Clairgeau, Flemish Beauty, Beurre Hardy.
Plum.—Kelsey, Damson.
Prune.—French, Hungarian, Bulgarian.
Fig.—Mission, White Smyrna, White Ischia.
Apricot.—Royal.

Report of William Chippendale, Duarte.

The leading fruits in this district are oranges and lemons, apricots, peaches, prunes (French), nectarines, limes, Muscat grapes, blackberries, and strawberries. The fruits I would recommend for planting are:
Orange.—Washington Navel, Mediterranean Sweet, Satsuma.
Peach.—Orange Cling, Lemon Cling, Early Crawford, Late Crawford.

Lime.—Mexican, Imperial (?).
Fig.—Brown Smyrna, White Adriatic.
Apricot.—Royal.
Plum.—Kelsey Japan.
Olive.—Mission.
Small Fruits.—Kittatinny blackberry, Cuthberth raspberry.
Table Grapes.—Black Hamburg, Sweetwater, Muscat, Purple Emperor, Rose of Peru, Black Morocco, Chasellas, Malvoise.

Report of J. D. Chaffee, M.D., Garden Grove.

The most profitable fruits grown here are apricots, there being a large acreage devoted to that fruit, which does exceedingly well; also, peach, apple, pear, and small fruits. With our soil so well adapted, not only to fruit culture, but the raising of grain and vegetables, our artesian wells, our coast facilities, being only about ten miles distant from the sea, and our fine climate, we consider this one of the finest localities of Southern California.

FRUITS RECOMMENDED FOR PLANTING.

The Royal apricot is the best bearer; of prunes, the French and Hungarian; walnuts, the soft shell is the best.
Apple.—White Winter Pearmain, Yellow Newtown Pippin, Gravenstein, Yellow Bellflower, Red Astrachan.
Peach.—The Crawfords are the best.
Pear.—Winter Nelis, Bartlett.
Small Fruits.—All kinds of blackberries, raspberries, and strawberries do well, and not much preference as to variety.

Report of L. L. Bequette, Los Nietos.

The leading fruits grown in this district are walnuts, pears, oranges, and apples.
The leading varieties are:
Walnut.—Hard Shell, English, Soft Shell.
Apple.—White Winter Pearmain, Yellow Bellflower, Yellow Newtown Pippin.
Peach.—Early Crawford, Late Crawford, Salway, Golden Cling, Tuscan Cling.
Pear.—Winter Nelis, Bartlett.
Prune.—As yet we do not know how prunes will do; there are a few orchards of Petite and Silver prunes, not old enough to bear yet.

Report of A. F. Kercheval, Los Angeles.

Fruits recommended for planting are:
Orange.—Seedling, Washington Navel, Mediterranean Sweet, Paper-Rind St. Michael.
Lemon.—Eureka.
Peach.—Alexander, Orange Cling, Salway, Early Crawford.
Apple.—White Winter Pearmain, Yellow Bellflower, Red Astrachan, Red June.
Pear.—Bartlett.
Grape.—Muscat, Flame Tokay, Black Hamburg, Golden Chasselas.
Strawberries, raspberries, and blackberries are grown quite extensively, although not in sufficient quantities to supply the demand; Compton,

Vernon, Alhambra, and other outlying districts contributing quite largely to make up the deficiency. The Strawberry guava is an excellent substitute for the strawberry in the winter and early spring, also excellent for jelly, and ought to be more extensively grown, as it is hardy and is a great bearer.

Report of Abbott Kinney, Lamanda Park.

This district is an orange and vine country, with a few apricot orchards and a few orchards of mixed fruits, principally on irrigated lands. The foothill portion is practically frostless, and produces the small fruits early, and late as well as early crops of strawberries, with proper care. The small fruits and vegetables could be made a profitable crop, but are only grown now for home use. Orange trees grow on unirrigated lands, but are small and bear no profitable crops.

FRUITS CHIEFLY GROWN.

Oranges, lemons, apricots, and wine grapes.

FRUITS RECOMMENDED FOR PLANTING.

Oranges, lemons, apricots, peaches, nectarines; and in small fruits, strawberries, blackberries, and raspberries. Oranges to be successful must be well watered. This tree is very exacting in this respect.

VARIETIES AND OBSERVATIONS.

Walnut.—English walnuts require free irrigation, otherwise nuts will have a tendency to shrivel.

Olive.—One orchard of large Italian olives; this orchard is partially cut into lots. Mission olives are on most of the places in small numbers. When well cared for they bear well, with a tendency to off years.

Orange.—Seedlings, Washington Navels, Malta Blood, Konah, Mediterranean Sweet, St. Michael (Paper Rind), are the principal varieties, but a large number of other varieties are to be found in small numbers in the district.

Lemon.—Eureka, Lisbon, Seedlings budded; these are poor shape, but sweet rind.

Apple.—A number of varieties are grown, but only on one place to any extent. They are not considered profitable; while the fruit is fair, the dry air makes the crop uncertain and generally small.

Peach.—A number of varieties are grown; fruit very fine and returns good. Orchards of peaches, however, small and confined to unirrigated land.

Pear.—A number of varieties grown; not very successfully, and not for market, except on one or two small places.

Nectarine.—Varieties not known. Several trees on my place, in a sandy wash, do remarkably well.

Apricot.—Royal, Blenheim; the Royal is cultivated along our foothills, and gives profitable returns.

Report of S. G. Baker, Norwalk.

Our leading fruits are oranges, walnuts, apples, apricots, and pears. The fruits recommended for planting are apples, pears, figs, peaches, prunes, oranges, lemons, and apricots, also grapes. The apricot is the chief fruit grown here.

VARIETIES AND OBSERVATIONS.

Apple.—White Winter Pearmain, Maiden's Blush, Smith's Cider. The above are the principal varieties. Quite a number of other varieties are grown, but no definite quantity.

Peach.—The early and Late Crawfords, Salway, Lemon Cling, Seedlings, and a variety not named, are grown in this district.

Pear.—The Bartlett and Beurre Hardy are the principal varieties grown; also a few other kinds.

Prune.—The Prune d'Agen is the principal kind planted; further time required to test thoroughly.

Fig.—The White Smyrna and common fig are grown somewhat promiscuously.

Orange.—About two hundred acres of oranges are grown in this district. Seedlings, Washington Navels, and Malta Blood are the varieties chiefly grown.

Nectarine.—The Boston and a nameless variety are grown here. Grown only for family use.

Lemon.—Cut no figure in quantity, being scattered in the orange groves and fence corners.

Report of D. Edson Smith, Santa Ana.

The fruits chiefly grown in this district are the orange, lemon, apple, pear, peach, apricot, and grape.

FRUITS RECOMMENDED.

Orange.—Seedling, Washington Navel.
Apple.—White Winter Pearmain, Yellow Bellflower.
Pear.—Bartlett, Winter Nelis, Flemish Beauty.
Peach.—Holland Cling, Lemon Cling, Crawfords, George IV, Alexander.
Plum.—Kelsey Japan.
Prune.—French.
Fig.—White Adriatic, Brown Smyrna.
Walnut.—Soft Shell.
Grape.—Muscat.
Lemon.—Eureka.
Apricot.—Large Roman, Royal.
Small Fruits.—The local market is pretty well supplied with all excepting guavas.

Report of W. H. Holabird, Claremonte.

We are in the northern slope of the great middle basin or valley, midway between the Los Angeles River Valley and the Santa Ana Valley. Our elevation above the sea level is one thousand three hundred feet; fogs are rare; artesian water abundant and piped to about ten thousand acres; temperature ranges from 45 degrees in winter to 85 degrees in summer.

FRUITS CHIEFLY GROWN.

Orange, lemon, apricot, prune, Kelsey plum, peach, olive, strawberries, blackberries, and raspberries.

RECOMMENDED FOR PLANTING.

The Washington Navel orange, Mission olive, Monarch of the West strawberry, Lawton blackberry, Lemon Cling peach, and Royal apricot.

MARIPOSA COUNTY.

Report of George Knight, Mariposa.

This district and county is very backward in any kind of fruit culture, owing to its distance from any market. All fruits and berries do exceptionally well when intelligently pruned and cultivated. The Yosemite Valley contains about one thousand five hundred apple trees, all planted by its first pioneer, James Lamon. All other varieties of trees in Yosemite do not exceed twenty trees. Apples are large and beautiful, but not extra fine in flavor, owing to its soil being granite debris, with absence of clay and other minerals. In Yosemite small fruits did extra well during the lifetime of Mr. Lamon, but they have died out lately by neglect. No profit in fruits of any kind; market gone with failure of the mines and the monopoly of the Yosemite Valley. Hotels are run on very little fruit or berry luxuries.

All fruits on this schedule do extra well, except six twenty-year old walnut trees that never bore a nut.

No citrus fruits, but I am sure that they would prosper in sheltered places. All below here on the river is in a thermal belt until reaching the Merced Plains.

FRUITS CHIEFLY GROWN.

All kinds, mostly seedlings, and hardly enough for home consumption, with the exception of Marshal Harris and Judge Grant, in the southern township, whose apples command the top figures at San Francisco market. Their places are three thousand feet above tide water, and on the edge of yellow pine belt. Apples do well at six thousand feet, in sheltered places.

NEW FRUITS.

I discovered a No. 1 apple, keeping as late as September; it grows at an altitude of four thousand feet; medium in size, with some carmine or red at stem end, resembling the Pearmain in shape. Am testing its keeping and fruiting qualities at my altitude, one thousand eight hundred feet. Think it will be a treasure for California during March, April, and May, when grown at its proper altitude. Four seedling varieties of nectarines, all extra good, and one of them, in my estimation, the pride of America—description: extra large, extra dark red; large seed, its only drawback; very yellow or golden flesh; ripens August first; a seedling from a peach.

MENDOCINO COUNTY.

Report of N. Wagonseller, Ukiah.

This district, until lately, has been entirely devoted to hop growing. Prunes and pears are the leading fruits. There is considerable land now being devoted to fruit growing. The most profitable fruits to grow are plums, Bartlett and Beurre Hardy pears.

RECOMMENDED FOR PLANTING.

Plum.—Yellow Egg, Peach, Washington.
Apple.—Red Astrachan, Gravenstein, Washington Strawberry, Wagner.
Pear.—Bartlett, Easter Buerre.

LEADING VARIETIES.

Apple.—Red June, Early Harvest, Red Astrachan, Gravenstein, Yellow Bellflower, Smith's Cider, White Winter Pearmain, Yellow Newtown Pippin, Wagner, Spitzenberg.
Peach.—Alexander, Hale's Early, Crawford, Honest Abe, Salway.
Pear.—Bartlett, Flemish Beauty, Winter Nelis, Beurre d'Anjou, Beurre Hardy, Easter Buerre, L. B. de Jersey.
Cherry.—Black Tartarian, Royal Ann, Belle Magnifique.
Plum.—Peach, Purple Egg, White Egg, Jefferson, Washington.
Prune.—French, Hungarian, Silver.
Fig.—Do not do well up here. Too cold and frosty.
Small Fruits.—Only grown to a limited extent, only for home use

Report of Mart Baechtel, Willits.

I regret that I am not able to give you a more satisfactory report. It arises chiefly from the fact that but few of the settlers know the varieties of fruit they have in their orchards. Some orchards are over thirty years old. The names of the varieties have been lost; many of the original planters have sold out and left the country. Some grapes are grown on the north side of the valley (southern exposure). Certain varieties of the grape can be grown successfully in this section, especially if planted in the hills. Surrounding the valley, the grape industry will become a very successful pursuit I think after awhile. Vegetables grow well here.

FRUITS RECOMMENDED FOR PLANTING.

Apple.—Summer: Red Astrachan, Early Harvest. Fall: Rambo, Gravenstein, Yellow Bellflower. Winter: Spitzenberg, Wagner, Baldwin, Yellow Newtown Pippin, Rhode Island Greening.
Small Fruits.—Are grown by a few of the settlers in the valley—our soil and climate are well adapted to their growth. I have grown strawberries for twenty years, without irrigation, and they do well. Blackberries require moist land; also currants.

Report of L. Hoag, Booneville.

We are thirty miles distant from the nearest railroad, and fruit raising for market is limited. All of the hardier deciduous fruits do well and produce immense crops, if properly cultivated and pruned. Peaches and pears make an immense growth and are of the finest flavor. It is but recently that fruit has received any attention, and many varieties are now being tested.

RECOMMENDED FOR PLANTING.

Early Crawford peach, Bartlett pear, French prune, Egg plum, Swaar, Yellow Newtown Pippin, Spitzenberg, and Baldwin apples. Our people are testing several other varieties that promise well, and are getting interested in the fruit industry.

The leading varieties grown here are:

Apple.—Swaar, Spitzenberg, Yellow Newtown Pippin, Gravenstein, Fall Pippin, Red Astrachan, Yellow Bellflower, Rhode Island Greening, Gloria Mundi, Baldwin.

Peach.—Early Crawford, Late Crawford, Salway, Orange Cling, Hale's Early, Susquehanna.

Pear.—Bartlett is the king of pears and grows to perfection here: Souvenir du Congress, Beurre Hardy, Beurre Diel, Winter Nelis, Clapp's Favorite.

Cherry.—Very few trees, don't know names, very uncertain crops.

Plum.—Purple Egg, Yellow Egg, White Egg, Green Gage, Coe's Golden Drop, Kelsey Japan.

Prune.—French, Hungarian.

Fig.—None, except in thermal belt—only one crop.

Report of C. A. Bush, Potter Valley.

This valley has never grown fruit for market. Every farm has a small orchard for home use. Many kinds of fruit have never been tested yet. With the railroad soon complete to Ukiah, distance twenty miles, we soon expect to have a market for all the fruit we can produce. This section is well adapted to the later varieties of peaches, prunes, plums, pears, and apples. All varieties of apples are grown profitably. Bartlett pears about one month later than in Sonoma. Apples of all kinds do fine here. I have seedlings growing along the fences that bear good apples without pruning or cultivation. Peaches and nectarines do splendidly here, also prunes and plums of all kinds. All cherries do well except Black Tartarians.

FRUITS RECOMMENDED FOR PLANTING.

Apple.—Spitzenberg, Limber Twig, Yellow Newtown Pippin.

Pear.—Bartlett, Winter Nelis, Easter Buerre.

Late varieties of peaches and nectarines and late varieties of plums.

MERCED COUNTY.

Report of Geo. E. Ladd, Atwater.

The most profitable fruits grown here are peaches, apricots, grapes, almonds, and blackberries.

FRUITS RECOMMENDED FOR PLANTING.

Peach.—Foster, Early Crawford, Wheatland, Muir, Susquehanna, Lemon Cling, Salway.

Almond.—IXL, Nonpareil.

Grape.—Trosseau, Folle Blanche, Mataro, Carignan, Verdel, West Prolific, Colombia, Tokay, Muscat of Alexandria.

LEADING VARIETIES GROWN IN THIS DISTRICT.

Peach.—Alexander, Early Crawford, Late Crawford, White Imperial, Wheatland, Lemon Cling, Salway, Susquehanna, Chinese Cling, Briggs' Red May, Foster, George's Late Cling, McIntire Late Free, Muir.

Pear.—Bartlett, Beurre Clairgeau, Winter Nelis, Souvenir du Congress, Keiffer's Hybrid.

Plum.—Yellow Egg, Green Gage.

Prune.—Hungarian, Petite d'Agen, Bulgarian.

Fig.—White Adriatic, California Black, White Ischia.

Table Grape.—Black Farrara, Flame Tokay, Muscat, Madaline, Verdel, Black Prince.

Small Fruits.—As yet yearly on the increase; planted, however, only to supply our home market.

Report of J. J. Stevenson, Livingston.

Anything grows and does well here, except the cherry; the tree grows well, but no fruit. Fruit raising is not practiced for market only on a small scale on the river bottoms. Mostly all of the fruits are raised on a small scale for home use. With water anything does well. Water is king, without it nothing does well.

Report of W. T. Livingstone, Central Point.

There are not many orchards or vineyards in this valley. I have over twenty varieties of grapes and some fruit trees of different kinds, such as apples, peaches, pears, plums, apricots, nectarines, quince, cherry, orange, lemon, almonds, walnuts, and all except apples and cherries do well.

MONTEREY COUNTY.

Report of W. T. Gilkey, Watsonville.

The leading fruits grown in this district are:

Apple.—Yellow Bellflower, Spitzenberg, Gravenstein, Fall Pippin, Yellow Newtown Pippin.

Peach.—Early Crawford, Salway, Foster, Early York.

Cherry.—All of the leading varieties.

Prune.—French, Fellenberg, Silver.

VARIETIES IN GENERAL CULTIVATION.

Apple.—Bellflower, Newtown Pippin, Smith's Cider, White Winter Pearmain, Fall Pippin, Gravenstein, Spitzenberg, Skinner's Seedling, Nonesuch, Northern Spy, Red Astrachan, Duchess of Oldenburg.

Peach.—Hale's Early, Early York, Early Crawford, Late Crawford, Foster, Salway, Lemon Cling, Heath Cling, California Cling.

Pear.—Bartlett, Flemish Beauty, Beurre Hardy, Winter Nelis, Seckel, Easter Beurre, Beurre Clairgeau, Duchess d'Angouleme, White Doyenne.

Cherry.—Black Tartarian, May Duke, Royal Ann, Governor Wood, Blackheart, Burr's Seedling, Rockport Bigarreau.

Plum.—Peach, Yellow Egg, Coe's Golden Drop, Jefferson, Washington, Imperial Gage, Duane's Purple, Quackenboss, Coe's Late Red.

Prune.—French, Silver, Fellenberg, German, Hungarian.

Almond.—Paper Shell, Nonpariel, IXL, Languedoc.

Quince.—Apple, Orange, Portugal.

Report of G. S. Gould, Innesdale.

This district is most too hot for apples, and too cold for figs; peaches do fine and are bright color and of very fine flavor. Nectarines are also exceedingly fine.

I would recommend the planting of the best varieties of pears, peaches, apples, nectarines, plums, prunes, and grapes.

Report of R. N. Windsor, Gonzales.

My district is difficult to describe; the products are phenomenal. The part adapted to fruit lies on the south of the Salinas River; composed of alluvial and mesa lands divided by a high bluff. The mesa is thermal, and adapted to tropical fruits; while the bottom produces the apple and pear to perfection. Being subject to severe frosts the growing of fruit here is mostly experimental; while on the adjacent mesa the most delicate flowers are uninjured. It is not yet determined which is the most profitable fruit, but from my own experience, having an orchard on rich bottom lands, I find the late apples the most profitable. I produced last season from forty trees, six years old, four hundred boxes, and disposed of them at 75 cents per box on the ground. The trees occupied one rod each, making one fourth of an acre. They were Yellow Bellflower, Smith's Cider, Yellow Newtown Pippin, and White Winter Pearmain, all of the finest quality. As I have stated, at present it cannot be determined what is the best to plant for the future. Without facilities for disposing of quantities of perishable fruits it would not be advisable to plant such. I do not think that such fruits as apples and pears, as grown on the bottom lands, can be overdone, as they stand transportation, and I shall continue to plant these fruits.

FRUITS RECOMMENDED.

Of apples, the Yellow Bellflower, Smith's Cider, and Jonathan are especially prolific on the alluvial land; also the Moorpark apricot, though not a certain bearer. The cherry, though making a fine growth on the bottom lands, produces poor fruit, while on the mesa is attained the greatest perfection. The prune in either location is excellent; but all fruits are about one month later maturing than in other localities.

The leading varieties in this district are:

Apple.—Yellow Bellflower, Smith's Cider, White Winter Pearmain, Yellow Newtown Pippin, Fall Pippin, Alexander, Red Astrachan, Gravenstein, Jonathan, King of Tompkins County.

Peach.—Briggs' Red May, Hale's Early, Alexander, Early Crawford.

Pear.—Bartlett, Winter Nelis, Beurre Hardy.

Table Grape.—Black Hamburg, Rose of Peru, Muscat, Muscat of Alexandria, White Chasselas, Pink Malaga, Red Tokay.

Cherry.—Bell Magnifique, May Duke, Black Tartarian.

Plum.—Yellow Egg, Quackenboss, Red Egg.

Prune.—Hungarian, French, German, Silver.

Fig.—White Smyrna, Black California.

Report of H. Westlake, Jolon.

The orchards in this district are young and no great variety has been tried. Those varieties of fruits that have been tried proved a success. There is no place in the State that the climate and soil are *better* adapted to all kinds of fruits. Apples, plums, peaches, apricots, and all kinds of berries do splendid, and their flavor cannot be beat.

Report of Edward Berwick, Carmel Valley.

At Pacific Grove there is no orchard land. A few fruit trees are set out on residence lots, but are not over luxuriant.

The remains of the old Carmel Mission (San Carlos) orchard, consisting of a row or two of pear trees of inferior variety, to which have been added a number of apple and pear trees of modern varieties, is the nearest to Pacific Grove. David Jacks has an orchard of apple and pear trees on the Sancito Ranch. My own orchard of various fruits, and my neighbor, Richard Snivelys, are the principal ones near Monterey. The leading varieties are:

Apple.—Yellow Bellflower, Smith's Cider, Red Astrachan, Yellow Newtown Pippin.

Peach.—Hale's Early, Late Crawford, Early Crawford.

Pear.—Bartlett, Winter Nelis, L. B. de Jersey, Easter Buerre.

Cherry.—Black Tartarian, Napoleon Bigarreau.

Plum.—Green Gage, Jefferson, Damson.

Prune.—Prune d'Agen, Hungarian.

Apricot.—Unsurpassed, and could be grown profitably if a cannery were established. Sun drying is not profitable—too moist climate.

Small Fruits.—Gooseberries, currants, and raspberries do very well, and considerable is done in that line.

FRUITS RECOMMENDED.

Local market good for apples, peaches, apricots, grapes, etc., but quite well supplied. Owing to the latitude and limited propagation of fruits in the county, there has been but little done in that line. The fruits that are mostly planted are apples, plums, and pears, but the leading fruit is the apple. The varieties recommended are the Spitzenberg and Yellow Bellflower.

NEVADA COUNTY.

Report of L. D. Rathburn, Patterson.

The fruits chiefly grown in this district are apples, apricots, peaches, pears, plums, prunes, nectarines, cherries, blackberries, raspberries, and strawberries. We grow all kinds of hardy fruits.

We are so far from the railroad that we have never given our attention to small fruits; same are only grown for home use. The olive is now being tried considerably, and several new orchards (in a small way) have been started.

NAPA COUNTY.

Report of H. L. Gibbs, Calistoga.

The apricot does not do well with us in the valley, but with an elevation of several hundred feet does first rate. Oranges are also doing well under the same conditions. The fruits most profitably grown in this district are: Royal apricots, peaches, and prunes.

The fruits chiefly recommended for planting in this district are: Petite d'Agen prune, Early and Late Crawford, Hale's Early, Susquehanna, Alexander, and Salway peaches, Royal apricot, Silver prune, and olives on the hills.

The chief varieties grown in this district are as follows:

Apple.—Yellow Newtown Pippin, Jonathan, Hoover, Yellow Bellflower, Gravenstein.

Peach.—Alexander, Hale's Early, Early Crawford, Late Crawford, Salway, Susquehanna.

Pear.—Bartlett, Winter Nelis.

Walnut.—English, Præparturiens.

Cherry.—Early May Duke, Late May Duke.

Plum.—Bradshaw.

Prune.—Petite d'Agen, Silver, Hungarian.

Fig.—Common black.

Small Fruits.—A very few grow enough raspberries and blackberries for their own use.

Report of Leonard Coates, Napa City.

Napa County produces the finest plums ever shipped, according to the Manager of the California Fruit Union. All varieties of prunes grow very large and fine. The leading varieties of peaches succeed well, and during the present dry season their size is unimpaired, the ground being still moist. Early Purple Guigne and California Advance cherries; prunes (as above named); Kelsey Japan, and Pond's Seedling plums; Muir, Salway, Seller's Cling, Susquehanna peaches; Alexander apple. These would be my first choice, but canning cherries pay well—Centennial, Napolean, and Rockport; also Bartlett pears and winter apples, including the Early Red Astrachan; then Royal and Blenheim apricots.

I would recommend the list just given, or any part of it, according to soil and location; also Commercial almond and Hatch's Seedling, Persian walnut. The leading varieties grown in this district are as follows:

Apple.—Red Astrachan, Gravenstein, Alexander, Yellow Newtown Pippin, Yellow Bellflower, Hoover, E. Spitzenburg, Winesap, Smith's Cider, Cook's Seedling, W. W. Pearmain, Baldwin, Fall Pippin, Rhode Island Greening, King of Tompkins County.

Peach.—Alexander, Hale's Early, Early Crawford, Muir, Susquehanna, Salway, Orange Cling, Lemon Cling, Seller's Cling, General Grant Cling, Foster, McKevitt Cling.

Pear.—Bartlett, Beurre Clairgeau, Beurre d'Anjou, Beurre Hardy, Winter Nelis.

Cherry.—Purple Guigne, Cal. Advance, Black Tartarian, Pontiac, Black Republican, Napoleon Bigarreau, Rockport, May Duke, Centennial, M. de Mezel.

Plum.—Kelsey Japan, Yellow Egg, Coe's Golden Drop, Bradshaw, Columbia, Green Gage, Pond's Seedling, Washington, Jefferson.

Prune.—Petite d'Agen, Silver, and Fellenberg.

Fig.—California Black, Smyrna, White Adriatic.

Nectarine.—New White, Hardwicke.

Almond.—Languedoc, IXL, Nonpareil, Commercial.

New Fruits.—Clyman plum, very early, ripened with Cherry plum, and almost as fine as Peach plum; Centennial cherry, California Advance cherry—these originated here.

MODOC COUNTY.

Report of John P. Allen, Ceenly.

So far, in this locality, only few trees are grown, and they are such as will stand considerable cold weather. I have about five hundred trees of summer and winter fruits. However cold our climate, these trees do very

well. The White Winter Pearmain, Yellow Bellflower, and Jonathan apples are among those that have done the best; also the Bartlett and Winter Nelis pears. Plums and cherries have been tried, and have done well, also a few small fruits.

Report of W. D. Morris, Lookout.

My section of country is rapidly coming to the front in the growing of fine apples, plums, and pears; also all the smaller varieties are excellent in quality and flavor. The names of the different varieties leave me "at sea," because I never gave that matter a thought. Considering the climate apples, pears, and plums thrive best.

All the hardier varieties of small fruits do well here, such as are raised in similar latitudes in the Eastern States.

Report of H. L. Merryfield, Eagleville.

This district is just beginning to become a fruit country. Many small new orchards have been planted the past season, mostly of apples, pears, gooseberries, currants, and strawberries, but the fruits chiefly planted are and *must be* hardy fruits, for only such could stand our climate.

MONO COUNTY.

Report of J. H. Connell, Coleville.

Instead of only reporting this district, I send you a report of all the county.

The chief varieties grown here are:

Apple.—Early Harvest, Red Astrachan, Red June, Alexander, White Winter Pearmain, Fall Pippin, Yellow Bellflower, Spitzenberg.

Peach.—Governor Garland, Briggs' Red May, Hale's Early, Early Crawford, Late Crawford, Susquehanna, Stump the World, Foster, Morris White, Salway, Lemon Cling, Twenty-Ounce Cling.

Pear.—Bartlett, Winter Nelis, Madeleine.

Cherry.—Royal Ann.

Plum.—Bradshaw, Green Gage, Washington, Columbia, Damson, Peach, Cherry.

Prune.—Petite d'Agen, Hungarian.

Fig.—Black, White Pacific, White Adriatic, Brown Turkey.

Almond.—Languedoc, Seedlings.

Quince.—Portugal, Orange.

Currant.—Cherry.

Strawberry.—Captain Jack, Sharpless, Monarch of the West, Park Beauty, James Vick.

PLACER COUNTY.

Report of P. W. Butler, Penryn.

FRUITS CHIEFLY GROWN.

Peaches, pears, apples, plums, prunes, cherries, grapes, strawberries, raspberries, and blackberries.

FRUITS RECOMMENDED FOR PLANTING.

Peaches, oranges (in favored localities), Newcastle apricot, cherries, apples, Hungarian prune, Duane's purple plum, table grape, strawberries, and raspberries, in the order named.

VARIETIES RECOMMENDED FOR PLANTING.

Peach.—Varieties as above mentioned.
Orange.—As above mentioned.
Apricot.—Newcastle.
Cherry.—Early varieties, for shipping only.
Apple.—Early varieties, for shipping only.
Prune.—Hungarian, French.
Pear.—Bartlett.
Plum.—Duane's Purple.
Grape.—Tokay, and other shipping grapes.
Strawberry.—Sharpless.
Raspberry.—Hansell, Red Antwerp.

Fruits rank in importance in the order above recorded in this locality, and are not excelled in quality, and sell for the highest prices in the eastern markets; and because of this high excellence, it is recommended to plant only the varieties in which we supremely excel.

At higher altitudes, winter apples, pears, cherries, plums, and grapes of the more hardy varieties do the best.

NEW FRUITS.

The Newcastle apricot originated with Silva & Son, but has been fruiting several years. It is as early as the Pringle; better than the Early Royal, and is a prolific bearer every year. It is invaluable as an early bearer.

VARIETIES IN GENERAL CULTIVATION.

Apple.—Red Astrachan, Gravenstein, Alexander.

Peach.—Alexander, Hale's Early, Foster, Susquehanna, Late Crawford, Brandywine, Salway, Albright Cling, George's Late Cling, Levey's Cling, and a yellowish cling grown by B. Browning, and ripening with Early Crawford.

Pear.—Bartlett, Winter Nelis.

Cherry.—Royal Ann, Black Tartarian, Centennial, Knight's Early Black.

Plum.—Duane's Purple.

Prune.—Hungarian, Petite.

Fig.—Smyrna (grown by H. E. Parker, of Penryn).

Table Grape.—Flame Tokay, Muscat, Morocco, Emperor, Black Hamburg, Rose of Peru, Cornichon.

Raspberry.—Hansell, Red Antwerp.

Blackberry.—Early Wilson, Early Crandall, Lawton, Kittatinny.

Orange.—Washington Navel, Maltese Blood, Mediterranean Sweet, Jaffa, Tangerine.

Olive.—Mission, Redding (?) Picholine.

Walnut.—English and Preparturians.

Small Fruits.—All small fruits do well here; strawberries and raspberries are thought to be more profitable. This certainly has been my experience, as strawberries planted between the trees of a young orchard will here

pay the expenses of growing the trees until they come into bearing. Small fruits are extensively grown for shipping east, and not for canning or drying, and more are grown for this purpose in Placer County than all the rest of the State.

Report of W. M. Baker, Colfax.

There is in the vicinity of Colfax perhaps between six and seven hundred acres devoted to fruit culture, about three fourths of this amount being planted to grapes and the balance to trees.

There are but few trees of desirable varieties that have come into bearing, being mostly two and three-year old trees; those that have have done remarkably well, far exceeding the expectations of the producer. Both trees and vines make a wonderful growth, and appear to be free from fruit pests. The most profitable fruits grown are apples, pears, plums, prunes, peaches, and grapes.

RECOMMENDED FOR PLANTING.

I would recommend only such fruits as are suitable for shipping. Being on the Southern Pacific Railroad, the fruits grown at this altitude (two thousand four hundred feet), maturing after the valley fruits have been disposed of, make shipping fruits more profitable than raising grapes for wine, or tree productions for canning or drying.

LEADING VARIETIES IN GENERAL CULTIVATION.

Cherry.—Black Tartarian, Royal Ann.
Plum.—Peach, Columbia, Kelsey Japan, Tragedy.
Fig.—Brown Ischia, White Adriatic.
Apple.—Yellow Newtown Pippin, Alexander, Spitzenberg, Baldwin.
Peach.—Hale's Early, Early Crawford, Late Crawford, Wheatland, Salway, Edward's Cling, Orange Cling, McGowan's Cling.
Pear.—Bartlett, Winter Nelis.
Walnut.—Black, English.
Olive.—Mission, Redding (?) Picholine.
Table Grape.—Flame Tokay, Muscat, Rose of Peru, Cornichon, Purple Damascus, Emperor.

Report of C. M. Silva, Newcastle.

Peaches and cherries are probably the most profitable fruits, pears about the same. All kinds of fruits have proven profitable this year.

NEW FRUITS.

Newcastle Early apricot, Rice's soft shell almond, originated here. Many new varieties of peaches, but none superior to those already in cultivation. A splendid seedling peach, ripening first of November, was exhibited at the Fruit Growers Convention last year.

FRUITS RECOMMENDED FOR PLANTING.

Summer apples, freestone and late cling peaches, pears, early and late plums, cherries, quinces, and figs.

VARIETIES RECOMMENDED.

Apple.—Red Astrachan, White Astrachan, Gravenstein, Alexander.
Peach.—Hale's Early, Foster, Early Crawford, Hyne's Surprise, St. John, Susquehanna, Late Crawford, Picquet's Late, Salway, Crawford Cling, Muir, June's Cling, Lovell, George's Cling, Tuscan Cling, Lady Palmerston, Levy's Cling.
Pear.—Bartlett, Winter Nelis, Beurre Clairgeau, Beurre Hardy.
Plum.—Duane's Purple, Walling, Coe's Golden Drop, Kelsey Japan, Ickworth's Imperatrice.
Cherry.—Black Tartarian, Werder's Early Black, Royal Ann, Lewelling.
Quince.—Orange.
Fig.—California Black, White Adriatic.

VARIETIES IN GENERAL CULTIVATION.

Apple.—Red Astrachan, White Astrachan, Gravenstein, Alexander, Yellow Bellflower.
Peach.—Alexander, Hale's Early, Foster, Early Crawford, Late Crawford, Susquehanna, Picquet's Late, Salway, Orange Cling, George's Late.
Pear.—Bartlett, Beurre Clairgeau, Winter Nelis.
Cherry.—Werder's Early Black, E. P. Guigne, Black Tartarian, Royal Ann, Lewelling.
Plum.—Washington, Duane's Purple, Bradshaw, Pond's Seedling, Coe's Golden Drop, Silva's K. Claudie.
Prune.—German, Hungarian, Petite, Fellenberg.
Fig.—Black California, White Adriatic.
Almond.—Languedoc.
Quince.—Orange, Portugal.
Table Grape.—Black Hamburg, Flame Tokay, Muscat, Purple Damascus, Rose of Peru, Mission.
Raspberry.—Red Antwerp, Hansell, H. R. Antwerp.
Blackberry.—Wilson's Early, Texas (Crandall), Lawton, Kittatinny.
Orange.—Washington Navel, Mediteranean Sweet, Seedlings.
Olive.—Mission, Redding (?) Picholine.
Walnut.—English, Seedlings.

Report of L. C. Gage, Lincoln.

Wherever it is practicable to use irrigation to the best advantage, all kinds of fruit so far tried have reaped a profit for the owner. Without water the returns from small fruits would not amount to anything. Grapes, peaches, apples, prunes, plums, pears, cherries, and apricots do fairly well without irrigation, if not crowded and are cultivated thoroughly.
The most profitable fruits grown in this district are as follows:
Grape.—Rose of Peru, Muscat, Black Morocco, Flame Tokay.
Plum.—Columbia, Bradshaw.
Prune.—Hungarian, French.
Apple.—Astrachan, Bellflower.
Peach.—Hale's Early, Alexander, Late Crawford, Early Crawford, Foster, Susquehanna, Salway, Twenty-Ounce Cling.
Pear.—Bartlett.
Cherry.—Royal Ann.

PLUMAS COUNTY.

Report of Mrs. R. B. Keep, Smith's Hill.

Smith's Hill is two thousand five hundred and fifty-seven feet above the sea. The thermometer seldom falls below zero, and usually there is very little snow. All fruits raised in a temperate climate grow to perfection here. Most of the fruits in our orchards are seedlings. We have a new apple of the Bellflower type, and a winter pear, raised from the seed. The apple is large and yellow, thin skin, and spicy flavor. The pear is also very fine. Will send graftings to any one who wishes them. Apricots are very fine; bloom in March, and often in February. Nectarines, plums, peaches, and figs grow as well in our locality as in the Sacramento Valley, and are larger and have a much finer flavor. Our cherries are as good as any in the State. Last winter was the coldest known here, and fig trees twenty years old froze to the ground. There are sprouts now five feet, with figs on, but they will not mature this season. The best of vegetables and fruits can be raised all along the east branch of the North Fork, from Rich Bar to Oroville. All we need now is quick and easy communication with the outside world. We still have the "forty-nine" trails, and consequently no way of getting fruit to market.

Mr. Beady has a fine orchard and small vineyard at Long Bar, and makes excellent wine. Were there a market for grapes, his vineyard could be enlarged to a profitable business. He also has fine figs, almonds, and chestnuts, blackberries, and raspberries. The raspberries grow on the bars quite extensively. Strawberries also do well; ripen in May.

Report of R. Martin, Quincy.

I am located between American and Indian Valleys. The altitude at this place is two thousand nine hundred feet, that of the two valleys about three hundred feet higher, which makes it much colder than here, and not as well adapted to the culture of the peach and cherry. The apple and the pear do best, of which the following varieties do well, and perhaps the best:

Apple.—Rhode Island Greening, Yellow Newtown Pippin, Spitzenberg, Winesap, Ben Davis, Twenty-Ounce Pippin, Early Harvest, Red Astrachan, Yellow Bellflower, Fall Pippin, Smith's Cider, Siberian Crab.

Pear.—Bartlett, Flemish Beauty, Winter Nelis.

SANTA BARBARA COUNTY.

Report of O. N. Cadwell, Carpenteria.

The most profitable fruits grown in this district are apples and apricots, and also grapes. English walnuts are very profitable on lands suitable for their growth. It is useless to plant the walnut on poor, shallow soil, and over hard clay subsoils.

We need a generous list of fruits for market, enough at least for the local market. Late keeping apples always sell at fair prices. I think the apple one of the most profitable fruits to plant, as we can ship them better than any other fruit.

LEADING VARIETIES GROWN.

Apple.—Yellow Bellflower, White Winter Pearmain, Red Astrachan, Fall Pippin, Ben Davis.
Peach.—Foster, Richmond, Early and Late Crawfords, Early Tillotson.
Pear.—Bartlett, Winter Nelis.
Plum.—Prince of Wales.
Prune.—d'Agen.
Fig.—Several varieties planted, but I think most of the common black.

Report of George W. Coffin, Santa Barbara.

It is now some six years since I was especially interested in growing the fruits named in this report, but judging by what I see in our market, there have been but few new varieties worthy of notice. In English walnuts there is an improved variety; it is of medium size, inclined to be long, instead of round, and has a smooth shell of more strength and firmness than the softshell. The trees come into bearing earlier than any yet reported—one in the nursery now, at Hollister ranch, having produced twelve perfect nuts at three years of age from the seed. English walnuts have become favorites with many. They require less labor, and as the tree advances in age, bear more regularly. With the improved species now in trees of five and six years old, they find ready sale at highest prices. In apples, Sexton Seedling is an improvement on any of the old species of its season, August to October. It is a large, yellow, smooth skin apple, rather flat than round; flesh, fine grained and juicy; sub-acid; skin thin; fine for table or for cooking.

Among pears, the Vicar of Wakefield becomes good in second class instead of third class, as in the East. Currants and cherries can be grown here as profitably and of as good quality as any produced in the State, if right conditions are adopted. Oranges, lemons, and olives have been more extensively planted among fruits than any others; apricots and prunes following closely next.

The most profitable fruits grown in this district are: oranges, lemons, English walnuts, prunes, apricots, olives, strawberries, grapes, pears, and Japanese persimmons.

LEADING VARIETIES.

Apple.—Early varieties: Summer Strawberry, Sexton's Seedling, Red Astrachan, Sweet Bough. Fall varieties: Rambo, Red Astrachan, Maiden's Blush, Yellow Bellflower. Winter varieties: White Winter Pearmain, Yellow Newtown Pippin, Golden Russet.
Peach.—Early York, Royal George, Summer Strawberry, Early and Late Crawfords.
Pear.—Seckel, Bartlett, Winter Nelis.
Cherry.—Black Tartarian, Royal Ann.
Plum.—Green Gage, Red Gage, Coe's Golden Drop.
Plum.—Egg, Purple, Cherry.
Prune.—French, German, Hungarian.
Fig.—California Black, White.
Small Fruits.—Are grown here very extensively, and are very profitable.

Report of J. Sexton, Goleta.

I inclose you the following list of fruits that do well in this section, as far as I have had chance to observe and test:

PROFITABLE FRUITS GROWN IN THIS DISTRICT.

Walnuts, apricots, peaches, prunes, pears, and olives. The leading varieties grown in this district are:

Apple.—Early Harvest, Red June, Red Astrachan, Rambo, Fall Pippin, Rhode Island Greening, Yellow Bellflower, White Bellflower, White Winter Pearmain, Yellow Newtown Pippin, Ben Davis, King of Tompkins County, Rome Beauty, Golden Russet, Red Canada, Nickajack, Red Siberian Crab, Yellow Siberian Crab, Transcendent.

Peach.—Hale's Early, Early Tillotson, Early Crawford, Foster, Royal George, Morris White, Salway, Lemon Cling, Smock's Late Free.

Pear.—Madeline, Clapp's Favorite, Beurre Hardy, Seckel, Beurre Clairgeau, Bartlett, Winter Nelis, Easter Beurre, Beurre Bosc.

Strawberry.—Monarch of the West, Sharpless, Wilson's Albany, Longworth's Prolific.

Cherry.—Worthless.

Plum.—Cherry, Damson, Kelsey Japan, Red Egg, Green Gage.

Prune.—Petite d'Agen.

Fig.—White Ischia, Black California, Smyrna, White Adriatic, San Pedro.

Report of R. Machin, Lompoc.

The most profitable fruits grown here are about as follows:

Apple.—The Gravenstein, Yellow Bellflower, and Skinner's Seedling are exceptionally fine in flavor and texture, far excelling the quality of the same varieties grown either north or south of this latitude.

Pear.—The Bartlett is full of promise, as also the Beurre Clairgeau.

Prune.—Much concern is felt for the French prune industry, just now claiming some attention on account of its liability to crack. Thus far the Bulgarian proves to be the better, and every indication points to its entire supplanting for economic use of the French prune.

LEADING VARIETIES.

Apple.—White Winter Pearmain, Early Harvest, Red Astrachan, Gravenstein, Rhode Island Greening, Fall Pippin, Holland Pippin, Smith's Cider, Stark, Winesap, Jonathan, Vandevere, Yellow Newtown Pippin, Skinner's Seedling, Empress of Russia, Yellow Bellflower, King of Tompkins County, Roxbury Russet, Golden Russet, Swaar, Ben Davis.

Prune.—French (small), and Large French.

Fig.—Brown Smyrna.

NEW FRUITS.

Sexton's Seedling apple is a superior August apple, that is good until the first of October.

Report of J. O. Williams, Goleta.

The most profitable fruits grown in this district are: apples, peaches, plums, and walnuts. The fruits chiefly grown in this district are: apples, peaches, figs, pears, olives, oranges, lemons, apricots, blackberries, strawberries, raspberries, nectarines, walnuts, grapes, plums.

FRUITS RECOMMENDED.

I would not recommend oranges, lemons, nor limes for planting in this district, for the white cottony cushion scale bug has ruined nearly all the orchards in this district; after fighting them for years, we yield to them.

NEW FRUITS.

Hollister's White Seedling peach.

The leading varieties grown in this district are:

Apple.—Early Harvest, Red June, Early Strawberry, Red Astrachan, Fall Pippin, Rambo, White Bellflower, Yellow Newtown Pippin, White Winter Pearmain, Russet.

Peach.—Royal George, Crawford, George's Cling, Strawberry.

Pear.—Sugar, Bartlett, Winter Nelis, Madeline.

Cherry.—Black Tartarian is the only cherry that does well.

SANTA CLARA COUNTY.

Report of W. H. Aiken, Wrights.

Grapes and fruits mature slowly and ripen late in the season, the latest in the State I believe. They grow large and firm, and are of good flavor; keeping good prices in local and eastern markets. They are grown in the Santa Cruz Mountains, sixty-five miles from San Francisco, at an elevation of about fifteen hundred feet. The soil is rich and deep for mountain regions. The climate is cool, invigorating, and healthy; rainfall, from thirty to sixty inches a year.

PROFITABLE FRUITS.

The most profitable fruits grown in this district are: plums, prunes, pears, and apples.

FRUITS RECOMMENDED.

I would recommend the planting of the French prune, Bartlett pear, Jonathan apple, Coe's Golden Drop or Silver prune, and Napoleon Bigarreau cherry. The leading varieties grown in this district are about as follows:

Apple.—Yellow Newtown Pippin, Jonathan, Yellow Bellflower, Red Astrachan, Smith's Cider, Baldwin, Hoover.

Peach.—Early Crawford.

Pear.—Bartlett.

Table Grape.—Muscat of Alexandria, Black Muscat, Rose of Peru, Flame Tokay, Black Hamburg, Black Ferrara, Cornichon.

Report of Wm. Pfeffer, Gubserville.

The Olive.—My experience about olive culture is very small; but think I have seen one thing: that the proper location for an olive grove is of the first importance. Too rich and moist a soil is for the olive about as bad as for the grapevine, while on the other hand, I don't care to have an olive grove on very poor land. As to the varieties to plant, the olive grower has no need to go through such an everlasting experimenting as the vineyardist. The Mission olive is in that respect like the Mission grape. Parties well

supplied both with enthusiasm and money should not get crazy in becoming the owner of the largest olive orchard in the world, same as has been with the vineyards; and, although it may not require as large an amount of intelligence to successfully carry on an olive orchard as it takes for a vineyard, planters will still find stumbling blocks in their way difficult to move aside. For successful olive culture the all important point will be a site where the proper degree of moisture and warmth below as well as above the surface is present for the requirements of the health and fruitfulness of the trees. So long as pure olive oil is scarce, indeed, it is a very tempting business to go largely into, but when fine distinctions in qualities are made, those that go to work intelligently will be the successful ones.

Report of C. G. Gordon, Saratoga.

The most profitable fruits grown in this section are as follows:

French prune, Petite d'Agen, or Robe de Sargent, to which our soil and climate seem to be particularly adapted.

Royal, Blenheim, Hemskirke, and Moorpark apricots, in the order named.

Yellow Egg plum principally cultivated, but all kinds do well.

Early Crawford, Late Crawford, and Salway peaches; Black Tartarian and Royal Ann cherries; Bartlett pears; and all varieties of apples do well, but the codlin moth is so far master of the situation.

RECOMMENDED FOR PLANTING.

Prune.—French.
Apricot.—Royal.
Cherry.—Royal Ann.
Peach.—Salway, Muir.
Pear.—Bartlett.

All kinds of plums bear heavy, but demand is light and prices low.

No finer flavored apples can be found anywhere; the codlin moth is the only barrier.

VARIETIES IN GENERAL CULTIVATION.

Cherry.—Black Tartarian, Napoleon Bigarreau.
Plum.—Yellow Egg, Green Gage, Ickworth's Imperatrice.
Prune.—Petite d'Agen, German, Hungarian.
Figs.—Scattering Black in family orchards only.
Apple.—Bellflower, Jonathan, Yellow Newtown Pippin.
Peach.—Early Crawford, Late Crawford, Early May, Foster, Smock, Salway, Lemon Cling.
Pear.—Bartlett, Winter Nelis, Easter Beurre.
Walnut.—English Soft Shell; they have not been a success, because they have been planted too close.
Olive.—Mission, Redding (?) Picholine.

Report of I. A. Wilcox, Santa Clara.

Nearly every variety of fruit grown in this State is successfully raised in this county. There are twenty thousand acres planted to fruit trees, and fifteen thousand acres in vines. The value of the fruit crop is estimated, in the history of the county just published, at $3,500,000.

There are six canneries in the county, credited with having put up this year two hundred and sixty-five thousand cases, an aggregate of fifteen million nine hundred thousand pounds of assorted fruits. The number of

persons employed in three of these canneries in San José was one thousand two hundred, principally women and children. The number of cans was six million three hundred thousand; the amount of green fruit used twenty million pounds.

J. H. Flickenger, who has an orchard of two hundred and fifty acres, makes a specialty of putting fruit up in glass. He alone has put up twenty thousand cases in the orchard, the present year, of canned goods.

These immense quantities of canned fruits are distributed over the entire United States, as well as in England, France, Germany, Australia, and New Zealand. Beside these canned fruits, very large quantities of cherries and other fresh fruits have been sent, chiefly by express, to Los Angeles, New Mexico, Denver and other points in Colorado, where these fruits are required, and where they have not been successfully grown.

While this county furnishes a large proportion of the green fruits for use in San Francisco, the eastern markets furnish the outlet for the largest share of these fruits. The shipments from San José by the broad gauge railroad alone, according to the figures by Mr. S. W. De Lacy, editor of the "San José Times," are as follows, during four months of this season:

In August	1,528,960 pounds.
In September	1,871,300 pounds.
In October	1,447,500 pounds.
In November	219,800 pounds.
Aggregating	5,067,560 pounds.

Of dried fruits, there were shipped:

In August	162,080 pounds.
In September	2,248,400 pounds.
In October	2,497,380 pounds.
In November	1,374,800 pounds.
Aggregating	6,282,660 pounds.

The dried fruits sent to San Francisco for reshipment would probably amount to from two hundred to three hundred tons. It is estimated from reliable sources, that there yet remains to be shipped the additional sum of three hundred tons of dried fruits, mostly prunes.

It is worthy of note that our apricot crop of last year amounted to fifteen thousand tons. This fruit grows to the highest state of perfection in this valley. In addition, it may be stated that the wine product of the season amounts to one million seven hundred thousand gallons. The almond crop is put down at one hundred tons. While the orange crop of 1886–87 amounted to about four thousand boxes, there may be said to be a failure of this season's crop, owing to the injury of trees the previous year by the remarkably cold weather of that season. Further, it may be stated that, while most of our dried fruits have found a ready market in the Eastern States and Territories, large quantities find their way to Australia and other ports.

A market has lately sprung up in Liverpool for our prepared prunes, and all that we can produce of this fruit may be wanted in this market alone, as there is special use there for fruit of this description. Considering the magnitude that the fruit product has already reached, with the prospects when our young orchards will come into bearing, and in view of the fact that a very large area of land will yet be planted, we wonder what the future will be.

The "Scientific American," of the present month, records the statement that the product of the famous Genesee Valley, in New York, amounted

to $2,000,000 during the past season. This background of fruit country has largely contributed to the building up of the City of Rochester, a city of probably one hundred thousand inhabitants. It may be of interest to say further that the fruit crop of that valley is chiefly apples, and that this fruit is mostly marketed in England and France. The influx of foreign coin for these fruit products has built up a large inland city in the Genesee Valley, and is a most encouraging assurance of our future destiny.

Report of W. A. Bishop, Alma.

Alma Valley extends from Los Gatos on the north nearly to Wrights Station on the south. It is nearly six miles long, and from two to five wide. The South Pacific Coast Railway runs through its length, and affords excellent shipping facilities. The soil is generally a gray loam tinged with red, and in places gravelly. Grapes and fruits of late varieties do remarkably well. Both soil and atmosphere are much drier than in the Santa Clara Valley. Wine grapes do not do as well as table varieties, when bulk is considered, but the wine has a richness of flavor superior to that produced in the valleys, where much larger quantities are obtained to the acre. No irrigation is required either for grapes or trees.

Table grapes, especially Flame Tokay, Black Ferrara, Muscat, and other varieties suitable for shipping long distances, do well; other varieties not so well adapted for shipping bring good prices, however. French prunes, peaches, Bartlett pears, and late varieties of apples, plums, and in favored localities almonds and cherries, for profit, are most valuable in the order named.

Small fruits are not extensively grown, and but few places in this district raise more than are required for household consumption. They do quite well provided they are given some little irrigation, or in spots where the soil is more of a sandy loam, than the greater portion of Alma and the surrounding hills.

VARIETIES RECOMMENDED FOR PLANTING.

French and Hungarian prunes, Bartlett and Seckel pears, Yellow Egg and Damson plums, Salway peach, Yellow Newtown Pippin apple.

Table Grapes.—Flame Tokay, Muscat of Alexandria, Black Ferrara, Red Emperor, White Verdel, Purple Cornichon, Black Hamburg, Rose of Peru, Seedless Sultana, Golden Chasselas. The first five are grown in large quantities; other varieties and some wine grapes are also grown.

Report of F. H. Blake, Gilroy.

The leading fruits grown in this district are: apples, peaches, pears, apricots, and prunes. The leading varieties are about as follows:

Apple.—Skinner's Seedling, Jonathan, Yellow Bellflower, Spitzenberg, Yellow Newtown Pippin, White Winter Bellflower, Winesap, White Winter Pearmain.

Peach.—Alexander, Briggs' Red May, Crawford, Salway, Lemon Cling, Seller's Cling.

Pear.—Bartlett, Winter Nelis.

Table Grape.—Muscat of Alexandria, Malvoise, Black Hamburg, Chasselas, Flame Tokay, Emperor.

Small Fruits.—Are quite profitable, but must be irrigated or planted on moist ground.

Report of Wm. Hannibal, Agnews.

The lowlands of Santa Clara Valley, around Alviso and Agnews, are given almost wholly to the raising of small berries, vegetables, apples, and pears. Stone fruits and grapes do not do well here, with the exception of Silver, French, and Gross prune.

VARIETIES CULTIVATED.

Apple.—Smith's Cider, Jonathan, Red Astrachan, Hoover, Yellow Newtown Pippin.

Peach.—Lemon Cling, Wager.

Pear.—Winter Nelis, Beurre Diel, Beurre Clairgeau, Vicar, Columbia, Bartlett, Beurre Hardy, Seckel.

Prune.—Silver, French, Gross.

Fig.—Black.

Small Fruits.—Berries are grown here more perhaps than in any other part of the State, and they pay very well. We do not count it any crop at all if we do not make over $300 per acre off strawberries and raspberries, and about the same off blackberries, although I have made $700 per acre off blackberries and $500 off strawberries.

Report of Geo. Niggley, San Felipe.

The most profitable fruits in the district are winter apples and pears—those that are good for shipping; cherries are also a good paying crop.

LEADING VARIETIES.

Cherry.—Black Tartarian, Cleveland Bigarreau, Napoleon Bigarreau, Governor Wood, Black Eagle.

Plum.—Coe's Golden Drop, Egg, Blue Damson, and all varieties to a small extent.

Prune.—French, German.

Fig.—Common Black, White Smyrna.

Apple.—Yellow Newtown Pippin, Yellow Bellflower, White Winter Pearmain, Smith's Cider, Gravenstein.

Peach.—Early Crawford, Late Crawford, Seller's Cling, Orange Cling, Lemon Cling.

Pear.—Bartlett, Winter Nelis, Beurre Clairgeau, Beurre Hardy, Seckel, Flemish Beauty.

SANTA CRUZ COUNTY.

Report of Dr. J. M. Stewart, Santa Cruz.

I shall call Santa Cruz more a wine-grape-growing county than anything else. I have no doubt that when the orchard wine grapevines of which she is now so proud, are grafted over to the best kinds, she will excel in producing the finest of wines. Yet Santa Cruz bears a large amount of table grapes, and possesses, as regards these, the almost unique advantage of ripening them in October, November, and even December, and can thus offer them to the markets when nearly all other places are out of grapes. Like apples, pears did excellently in Santa Cruz before the appearance of the codlin moth; to-day still Watsonville fears not the codlin moth, and has thus an immense advantage in her cold fogs, which kill off the

codlin moths to almost the last one. Olives promise well in Santa Cruz; walnuts are a sure thing; Royal apricots pay well, and peaches fairly.

PROFITABLE FRUITS GROWN.

Peaches, apricots, prunes, walnuts, apples, and pears would be but for the codlin moth. Table grapes pay better than any fruit—that is, the good, late varieties.

RECOMMENDED FOR PLANTING.

Peaches, apricots, prunes, walnuts, late and table grapes, olives, apples, and pears, as soon as an approachable sufficient remedy can be found against the codlin moth.

LEADING VARIETIES.

Apple.—Yellow Bellflower, Yellow Newtown Pippin, Rhode Island Greening, Baldwin, Jonathan, Gravenstein, King of Tompkins County, Lawver.
Peach.—Hale's Early, Briggs' Red May, Early Crawford, Salway, Orange Cling.
Pear.—Bartlett, Beurre Clairgeau, Winter Nelis.
Cherry.—Napoleon Bigarreau, Governor Wood.
Plum.—Washington, Coe's Golden Drop, Egg.
Prune.—Petite d'Agen.
Figs.—Several varieties.

Report of H. W. Buckman, Glenwood.

The most profitable fruits grown here are table grapes, French prunes, peaches, and apples. The leading varieties are:
Apple.—Yellow Newtown Pippin, Yellow Bellflower.
Peach.—Early Crawford, Late Crawford, Salway, Lemon Cling.
Pear.—Bartlett, Winter Nelis.
Plum.—Egg.
Prune.—French, Hungarian.

FRUITS GROWN.

Late apples, peaches, particularly late varieties, Bartlett pears, Yellow Egg plums, French prunes, Verdel grapes, Muscat of Alexandria, where the soil is light, with southwest exposure; Black Ferrara; our season is most too short for the Tokay and others of that family. All wine grapes do well on altitudes above one thousand two hundred feet, with southern exposure.

RECOMMENDED FOR PLANTING.

Apple.—Smith's Cider, Baldwin, Yellow Newtown Pippin.
Peach.—Late Crawford, Early Crawford, Salway, Alexander.
Pear.—Bartlett.
Plum.—Yellow Egg, French Prune.
New Fruits.—A seedling apple which is large and fine; red stripe. A seedling peach; bids fair to be valuable.

Report of J. Waters, Watsonville.

Pajaro Valley being bounded on the southwest by Monterey Bay, has much foggy weather, hence in the valley peaches and apricots are not much grown, but these fruits near the hills are grown to perfection. The valley is well adapted to plums, prunes, cherries, apples, and pears. Apples are grown to perfection, nearly all varieties doing exceedingly well. Having so far escaped the ravages of the codlin moth, much attention is being given to the cultivation of apples. Some attention is being given to the cultivation of wine grapes in a small way. Claret wine of fine quality is made from grapes grown within one mile of Watsonville.

FRUITS RECOMMENDED FOR PLANTING.

Apples, prunes, cherries, apricots, and early varieties of peaches, Bartlett pears, and also Beurre Hardy and Beurre Clairgeau pears.

LEADING VARIETIES.

Apple.—Gravenstein, Yellow Bellflower, Smith's Cider, Lawver, White Winter Pearmain, Yellow Newtown Pippin, Winesap.
Prune.—French, Silver.
Cherry.—Gov. Wood, Blackheart, Knight's Early Black, Napoleon Bigarreau.
Apricot.—Royal, Blenheim, Large Early Montgamet.
Peach.—Alexander, Hale's Early, Early Crawford, Muir, Salway, Amsden's June.
Pear.—Bartlett, Beurre Hardy, Beurre Clairgeau, Winter Nelis, Glout Morceau, Vicar of Wakefield.

NEW FRUITS.

An apple, found growing in the yard of the hotel at Aptos, which I have named Welch Seedling; a large, fine apple, beautiful color, of fine vinous flavor, keeps till fall. Another apple which resembles Red June, evidently a seedling of this variety; ripens a month or more later; originated in this valley.

LEADING VARIETIES OF DISTRICT.

Apple.—Red Astrachan, Gravenstein, Fall Pippin, Yellow Bellflower, Smith's Cider, Rhode Island Greening, Yellow Newtown Pippin.
Peach.—Alexander, Hale's Early, Early Crawford, Salway, Foster, Late Crawford, Smock's Late.
Pear.—Madeline, Bartlett, Glout Morceau, Vicar, Winter Nelis, Beurre Hardy.
Cherry.—Governor Wood, Blackheart, May Duke, Black Tartarian, Napoleon Bigarreau, Rockport Bigarreau.
Plum.—Jefferson, Yellow Egg, Duane's Purple, Pond's Seedling, Bradshaw, Reine Claude de Bevay.
Prune.—Petite d'Agen, Silver, German.

SAN MATEO COUNTY.

Report of J. T. Doyle, Menlo Park.

VARIETIES RECOMMENDED FOR PLANTING.

Cherry or Plum.—The sorts you like, as all do well.

Grape.—Black Hamburg, Chasselas, small White Muscat (avoid large), White Sweetwater, Babrossa; though not much of the last, as our soil is too rich for it. None but early grapes ripen here.

English Walnuts.—Are good if you get a good location. Atherton's crop of them, as he informed me, never failed; mine do almost always. His crop of almonds failed three years out of five; mine, never. It is a question of local frosts in spring.

Peach.—Hale's Early, Strawberry.

Pear.—There are so many sorts, I cannot recommend; all do well as far as I can discover.

VARIETIES AND OBSERVATIONS.

Cherry.—All cherries do well and bear abundantly, and large fruit; but the birds are so abundant that you must cover your trees, as a guard over them, if you want fruit.

Plums.—Do very well; yield plentiful crops and good fruits. I cannot say more in favor of one sort than another.

Prune.—I am not able to speak as to prunes; will plant some this winter, and when better informed will report again.

Apple.—I have fifty or sixty trees of various varieties; can't say any do well, except a big sort given to me as "Magnum Bonum," or a similar name. Pippins are poor; Pearmains the same; Bellflowers do not bear at all, run all to wood.

Peach.—Hale's Early is the best according to my experience, and is really good; the Crawfords are dry; Strawberry very fair. Late peaches do not ripen here.

Pear.—All pears do very well; for me, the Bartlett seems the best.

Small Fruits.—I do not think small fruits are raised to any great extent. I tried strawberries, blackberries, and currants, and I failed. I do not feel tempted to repeat the experiment, as I feel sure that no one can get good results out of small fruits in this soil and locality.

Report of W. J. McNulty, Woodside.

Nearly all kinds of fruit do well here without irrigation. The foothills are especially adapted to grapes, prunes, pears, and apples. The codlin moth is about all we have to contend with; it prevails to an almost alarming extent this year.

FRUITS CHIEFLY GROWN.

Apples, pears, peaches, French prunes, grapes, blackberries, and strawberries.

LEADING VARIETIES.

Apple.—Early Harvest, Red Astrachan, Strawberry, Jonathan, Baldwin, Spitzenberg, Smith's Cider, Yellow Bellflower, Winesap, Yellow Newtown Pippin, White Winter Pearmain, King of Tompkins County.

Peach.—Early Strawberry, Early Crawford, Late Crawford, Salway.
Pear.—Bartlett, Beurre Hardy, Beurre Clairgeau, Seckel, Winter Nelis.
Cherry.—Black Tartarian, Royal Ann.
Plum.—Coe's Golden Drop, Jefferson, Bradshaw, Green Gage.
Prune.—German, French, Silver.

Report of J. Schmoll, Belmont.

I have had an orchard here for the last fifteen years of about three hundred trees, viz.: apples, peaches, apricots, plums, pears, prunes, and a few cherry trees, all doing well, especially plums and prunes. The apples did well for awhile, until they became infected with worms, etc., and are now of little use. Have not tried small fruits such as currants, raspberries, etc., but have heard from others who have, that they do well. I would not recommend the replanting of apples unless the codlin moth is kept at bay.

SIERRA COUNTY.

Report of S. B. Davidson, Downieville.

We are about three thousand feet above sea level and upon river banks and cañons, with mountains on either side, three thousand five hundred feet above us, whose tops are covered with scrub oaks, berries, acorns, scrub chestnuts, etc. Early spring and late frosts (usually partners in our mountains), destroy all fruits one year in four, hence orchards have not proved very profitable with us, except the *potato orchards*; these invariably pay profits and produce the finest potatoes in the world, but too far from the railroad.

LEADING FRUITS GROWN.

Apples, pears, cherries.

VARIETIES GROWN.

Apple.—Spitzenberg, Rhode Island Greening, Yellow Newtown Pippin, Yellow Bellflower, White Winter Pearmain, Rawle's Janet, Baldwin, Spice.
Peach.—Formerly all varieties were abundant and unsurpassed in flavor and size, but during the past ten years trees have died, and replanting has been unsuccessful. Very few varieties grow here now.
Pear.—Bartlett, Seckel, Winter Nelis, in fact any and every variety grows abundantly.
Cherry.—Black, Red, White, Yellow; all abundant and of finest flavor.
Plum.—All kinds of garden plums grow abundantly, but not prized. The only plum prized is our common wild mountain plum. This covers the mountain sides and river flats, and finds ready market at good prices, while cultivated Gage, Blue, and Egg plums scarce pay gathering.
Prune.—But few grow; they grow well and like plums are abundant producers, season permitting.
Fig.—None—too cold; cannot be grown.
Almonds.—Grow well and produce abundant crops when spring frost permits.
Quince.—Grow well; average good producer.
Currant.—Not successful; will grow here, but cost all they are worth.
Strawberry.—Garden-cultivated grow and produce well; all varieties grown; find ready market; do not mature until late in summer.

The Wild plum is the only fruit of consequence; of this there are many varieties, but I am not sufficiently posted to describe them further than that the trees sometimes grow large, but generally of scrubby growth, and the fruit delicious for preserves.

Report of Frank Moran, Goodyear Bar.

This district is capable of producing good fruits, but the amount produced exceeds the demand, as we are situated about sixty miles from a desirable market. The fruits that do the best with us are apples, cherries, pears, peaches, and prunes. Blackberries, strawberries, and raspberries are grown to a large extent.

SAN JOAQUIN COUNTY.

Report of W. B. West, Stockton.

Our farmers had, until about 1885, given their attention to grain growing, which has been quite profitable; but few orchards have been planted, except for home use, and little attention given to fruit or grape growing.

Since 1885, a few orchards have been planted, but as some of them are only young, they have not made much showing in the market. There is a great deal of land suitable for orchards and vineyards.

PROFITABLE FRUITS GROWN.

Table and Wine Grapes.—The only vineyards of any extent at present in bearing are in the western portion of the county, where the land is strong, and the spring and early summer climate is influenced by the cool winds from the northwest. The Muscat of Alexandria does not set well, but on the more sandy and hotter lands of the eastern portion they thrive and produce good grapes for raisins.

Walnut.—The French varieties are the only ones that are of any value. Præparturiens, Chaberte, and Mayette are good and productive.

Table Grapes.—Madeline, Black Hamburg, Sweetwater, Black Ferrara, Emperor.

VARIETIES AND OBSERVATIONS.

Apple.—Not grown successfully.

Peach.—The early varieties are not profitable, as they are not as early as those from Vacaville and other localities. Summer and fall varieties are profitable; Crawfords, Salway, Susquehanna, Muir, and Orange Cling have been planted largely in the older orchards.

Pear.—Bartlett.

Cherry.—Governor Wood, Elton, Black Tartarian, Napoleon Bigarreau; all bear well.

Plum.—These have not proved profitable, and none are being planted. Almost any kind, if attended to, will bear crops.

Prune.—The Robe de Sargent, or the improved French prune, has proved a very excellent bearer and a thrifty grower. I imported this variety, and found it distinct from the French prune of San José, both in growth of tree and fruit. The Petite prune of San José bears well, is sweet, and profitable, but I think inferior to the above.

Fig.—The Black California is the only one that has done well.
Nectarine.—Of no value as far as I know. Have had every variety common in this State, and find them all unprofitable.

Report of N. H. Locke, Lockeford.

The most profitable fruits grown in this district are peaches, pears, prunes, and figs. The leading varieties of the district are:
Apple.—Red Astrachan, Early Harvest, Rhode Island Greening, Spitzenberg.
Peach.—Alexander, Briggs' Red May, Hale's Early, Foster, Early Crawford, Salway, Late Crawford, Blood Cling, Chinese Cling, Heath.
Pear.—Bartlett, Beurre Hardy, Winter Nelis.
Cherry.—Black Tartarian.
Plum.—Yellow Egg.
Prune.—Fellenberg, Hungarian, French, Silver.
Fig.—Smyrna, California, White Adriatic.

Report of A. Thornton, New Hope.

Spring and winter apples are the best varieties here. Peaches do well. Fruit raising in this section is comparatively new, but we have a large body of as fine fruit land as there is in the State, and equally as good as any of the choice fruit land on the Sacramento River. Our specimens of fruit come up to the standard. The table grapes cannot be surpassed. Small fruits do exceedingly well, and are profitable.

Report of S. Cady, Ripon.

The fruits chiefly grown in this district are: grapes, plums, peaches, apricots, figs, nectarines, apples, prunes, strawberries, raspberries, and blackberries. The leading varieties grown here are as follows:
Apple.—Red Astrachan, Early Harvest, Red June.
Peach.—Late Crawford, Early Crawford, White Cling, Yellow Cling, Lemon Cling.
Pear.—Bartlett, Early June.
Plum.—Green Gage.
Fig.—White, Black.

Report of A. A. Cudner, Lockeford.

The fruits chiefly grown in this district are: apples, pears, peaches, almonds, prunes, apricots, and figs.

VARIETIES RECOMMENDED FOR PLANTING.

Peach.—Early Crawford, Susquehanna, Alexander, Hale's Early, Chinese Cling, Blood Cling.
Plum.—Green Gage, Yellow Egg.
Prune.—Fellenberg, Hungarian, French, Gross.
Nectarine.—Hardwicke, New White.
Apple.—Early June, White Winter Pearmain.
Fig.—Black California, Smyrna.
Strawberry.—Monarch of the West.
Cherry.—Black Tartarian.
The leading varieties grown in this district are:

Apple.—Red Astrachan, White Winter Pearmain, Rhode Island Greening, Spitzenberg, Baldwin, Yellow Newtown Pippin, Early Harvest, Red June.

Peach.—Alexander, Briggs' Red May, Hale's Early, Foster, Early Crawford, Susquehanna, Salway, Late Crawford, Muir, Blood Cling, Chinese Cling, Heath Cling, Orange Cling.

Table Grape.—Black Ferrara, Black Hamburg, Black Prince, Flame Tokay, Muscat of Alexandria, Seedless Sultana, Isabella.

Plum.—Yellow Egg, Green Gage.

Prune.—Fellenberg, Hungarian, French, Gross.

Fig.—Black California, Smyrna.

Report of Thomas Clements, Clements.

Peaches, pears, plums, prunes, and apricots are a grand success on the lowlands, and immense profits are made in good seasons. On the upland almonds and apricots do very well.

The leading varieties grown in this district are about as follows:

Apple.—Yellow Bellflower.

Peach.—Early Crawford, Late Crawford, Hale's Early, Foster, Day's White Free, Day's Yellow Free, Jones' Seedling, Susquehanna, Wheatland, Ward's Late Free, Salway, Smock's Cling, Orange Cling, Lemon Cling, Heath's Cling, George's Cling, Chinese Cling, Wager Freestone.

Cherry.—Knight's Early Black, Black Tartarian, Governor Wood, Royal Ann.

Plum.—Cherry, Peach, Columbia, Duane's Purple, Coe's Golden Drop, Gross Prune d'Agen.

Prune.—French, Silver.

Nectarine.—Boston, Hardwicke, Stanwick, New White.

Report of W. H. Robinson, Stockton.

Our leading fruits are: table and wine grapes, apricots, almonds, blackberries, and in certain localities pears and prunes.

LEADING VARIETIES.

Apple.—Not grown to any extent except on the Mokelumne River. The local market supplied by mountain fruit.

Peach.—Late Crawford, Early Crawford, Salway, Susquehanna, Orange Cling. The early varieties do not ripen soon enough to be profitable; middle and late do better.

Pear.—Bartlett, Winter Nelis.

Cherry.—Black Tartarian, Governor Wood.

Plum.—The old varieties not profitable; no market; do not bear as well as formerly.

Prune.—French; very few German grown here, mostly dug up and replaced with French; Robe de Sargent does well, and is a better grower; La Petite (from San José) is a favorite, and the Silver is on trial.

Fig.—Black California.

NEW FRUITS.

Endich fig, small, excellent drier. Texas blackberry, said to excel all others; grown on low lands.

SHASTA COUNTY.

Report of George Beece, Texas Springs.

The most profitable fruits grown here are: peaches, apples, pears, and plums. Some figs are grown, but on trial only. Table grapes do well, as also apricots, but they are only planted to a very limited extent; the same may be said of small fruits.

Report of J. S. P. Bass, Stillwater.

Stillwater Post Office, or Bass Station, is situated twelve miles northeast of Redding, on Stillwater Creek, which rises in the Limestone Mountains and runs south, emptying into the Sacramento River some twelve miles south of Redding, the district of which comprises a radius of perhaps twelve miles, within which there are but three orchards beyond an experimental stage. I have the oldest orchard in the district; it is small and only for family use. F. W. Fish has an orchard one and a half miles below, containing a general variety of fruits (including oranges), which grow to great perfection, and for their fine quality were awarded the gold medal at the State Fair, at Sacramento, two years ago. P. Seaman and Jas. Williams have orchards in full bearing, principally of pitted fruits, which grow to great perfection. There are many young orchards being planted.

SISKIYOU COUNTY.

Report of W. G. Grider, Sciad.

We grow the following fruits here; they do well, but the demand is much less than the supply: apples, pears, peaches, plums, cherries, and prunes. Small fruits are also grown and do well, but are planted only to a limited extent.

Report of A. H. Denny, Callahan.

We raise as fine apples in Siskiyou County as grow, and when the frost does not catch them we have so many that they are hardly worth picking, but now we are in hopes of shipping them at a profit, since the railroad has come.

PROFITABLE FRUITS.

Small fruits are the most profitable thus far, and since the advent of the railroad many have begun to set out fruit trees of all kinds, as a market will be opened for all we grow. We are in a cold belt, and what trees may be planted must be of the hardy kind.

FRUITS RECOMMENDED.

Good keeping late apples, Oxheart cherries, early peaches, and small plums, suitable for preserving.

SMALL FRUITS.

Small fruits and berries are grown quite extensively for home use, but not to ship. I would recommend every farmer and miner who has water to put out strawberries, raspberries, blackberries, gooseberries, and all

small fruits, for if they are given a little care they will yield a better reward than the wheat field or grain.

SAN BERNARDINO COUNTY.

Report of J. E. Cutter, Riverside.

LEADING FRUITS.

The orange is first, reaching here its highest limit of profit. The raisin (Muscat) grape is second, reaching also its highest limit of production. Apricots are third (in large orchards), they prove very profitable. Peaches pay well. Pears produce very well, but market is not good. Oranges and raisins are specialties, dwarfing all other crops.

NEW FRUITS.

Two seedling blood oranges have originated in Riverside; also a pear-shaped lime, larger than a lemon, but of very bitter rind.

FRUITS RECOMMENDED FOR PLANTING.

Oranges and raisin grapes, with apples, peaches, pears, figs, quinces, blackberries, and strawberries for home consumption.

LEADING VARIETIES.

Orange.—Washington Navel, Mediterranean Sweet, Maltese Blood, St. Michael, Wilson, Konah, Seedling. The Seedling probably constitute one half of all the Riverside production.

Lime.—Seedling (the culture is practically discontinued).

Table Grape.—Black Hamburg, Black Malvoise, Black Morocco, Tokay, Verdel, Muscat. Table grapes are only raised for home use.

Apple.—Yellow Bellflower, White Winter Pearmain. Apples are but little raised in Riverside.

Peach.—Crawford, George IV, Lemon Cling, Orange Cling.

Fig.—Brown Genoa, White Smyrna (?), Blue.

Report of G. H. Crafts, Redlands.

My place is about two thousand feet above sea level, just at the foot of the San Bernardino Mountains. We have hot, dry summers, and cannot grow anything without irrigation. Soil is a gravelly loam, which takes water rapidly, and if properly cultivated holds moisture very well. Frost is almost unknown. Citrus trees, from the seed, need no protection from cold.

FRUITS CHIEFLY GROWN.

Orange, lemon, Muscat grape, apricot, peach, prune, nectarine. They are profitable in the order named.

FRUITS RECOMMENDED.

Washington Navel orange, Eureka lemon, Muscat of Alexandria grape, a few apricots, peaches, pears, prunes, blackberries, and raspberries. Almonds do not do well. Quinces are very vigorous growers, and bear well.

Lemon.—Seedling, Eureka, Lisbon, grow vigorously, and bear abundantly. I have one tree twenty years old, from which I picked and sold twenty-four boxes, weighing seventy pounds to the box. This is a seedling.

Walnut.—English; do not bear well.

Orange.—Washington Navel; they bear very well and have no enemy.

Table Grape.—Muscat, Flame Tokay, Emperor.

Apple.—Rambo, Early Harvest, Red Astrachan, Ben Davis, Yellow Newtown Pippin, Maiden's Blush, Kent, White Winter Pearmain, Rhode Island Greening, Red Bellflower, Bailey's Sweet, Red Streak. I find that the apple will do well, if it is kept wet all the time, otherwise not.

Peach.—Lemon Cling, Orange Cling, Davis Cling, Smock's Late Free, Salway, Susquehanna, Crawford's. All varieties do well. The Smock and Salway are the best for drying; the Orange Cling for canning.

Pear.—Bartlett, Keiffer's Hybrid. The pear grows very rapidly and the fruit to fine quality, but deficient in quantity.

Plum.—The Kelsey is the only plum that seems to bear well.

Prune.—The French Petite bears heavily. The Gross and Silver do not bear.

Fig.—I have the Smyrna, so called, but it does not bear well. The common Black California fig bears and grows vigorously. Have trees thirty years old that are two feet in diameter.

Report of W. E. Collins, Ontario.

Our district is preëminently adapted to citrus fruits. Deciduous fruits are not regarded as desirable for permanent planting, as citrus fruits are much more profitable and no more trouble, as the following table will show. We had on June first, two hundred and thirty acres assorted deciduous fruit trees around homes; eight hundred and thirty-four acres of oranges; fifty-one and a half acres of lemons; seventy-one and a quarter acres of prunes; one hundred and fifty-one acres of apricots (Royal and Moorpark); forty-two and three quarters acres of peaches; three hundred and twenty-nine acres of grapes (chiefly Muscats); ten acres of olives; eight acres of figs; two and a half acres of blackberries; two acres of pears. The result of five years cultivation and labor.

LEADING FRUITS.

Orange, lemon, and the prune.

RECOMMENDED FOR PLANTING.

Orange.—Washington Navel, Maltese Blood.
Lemon.—Eureka, Lisbon, Improved Sicily.
Prune.—French.

LEADING VARIETIES.

Orange.—Washington Navel, Maltese Blood, Mission Seedling.
Lemon.—Eureka, Lisbon.
Table Grape.—Muscat, Malaga, Mission, Flame Tokay.
Prune.—Hungarian, French.
Fig.—White Adriatic.
Peach.—Early Crawford, Late Crawford, Lemon Cling, Heath Cling.
Pear.—Bartlett, Clapp's Favorite, Flemish Beauty.

Report of Scipio Craig, Redlands.

Where all the conditions of soil and climate are favorable, no fruit grown can compare with the orange for continuous profit. Then comes the apricot, then raisin grapes, peach. This section is rapidly being turned into a gigantic orange orchard, other fruits being taken up to make room for that king of fruits. Where the conditions are not thoroughly satisfactory, the apricot and raisin grape contest for the supremacy. Apples and cherries are grown in the mountains; elevation from two thousand to four thousand feet, and are fine.

FRUITS CHIEFLY GROWN.

Oranges, apricots, raisin grapes (Muscat), and peaches.

RECOMMENDED FOR PLANTING.

Orange.—Washington Navel, Maltese Blood, Mediterranean Sweet, Seedling.
Apricot.—Royal, Peach.
Grape.—Muscat.
Peach.—Foster (for drying), Lemon Cling (for canning), Late Crawford (for drying), Smock's Late Free (for drying), and Salway (for drying).

SAN BENITO COUNTY.

Report of J. W. Green, Hollister.

FRUITS CHIEFLY GROWN.

Apricots, prunes, pears, grapes, apples, cherries, walnuts, almonds, quince, strawberries, and blackberries.

RECOMMENDED FOR PLANTING.

Prunes, pears, apricots, grapes, cherries, walnuts, almonds, strawberries, and blackberries.

LEADING VARIETIES GROWN.

Apple.—Green's Newtown Pippin, Gloria Mundi, Yellow Newtown Pippin, Rambo, Rhode Island Greening, Hubbardston's Nonesuch, Baldwin, Swaar, Russet, Winesap, Limber Twig, Twenty-Ounce Pippin, Fall Pippin, Northern Spy, Smith's Cider, Yellow Bellflower, E. Spitzenberg, Roxbury Russet, Grindstone, Virginia Greening.
Peach.—Wager, Smock, Heath Cling, Orange Cling, Grove's White Cling, Old Mixon Free, Late Crawford, Snow, Salway, Lemon Cling, Grove's Red Cling, Briggs' Red May, Alexander.
Pear.—Bartlett, Winter Nelis, Seckel, Flemish Beauty, P. Barry, La Conte, Beurre Hardy, Easter Buerre, Keiffer's Hybrid.
Table Grape.—Black Hamburg, Flame Tokay, Muscat of Alexandria, Rose of Peru, Purple Damascus, Verdel, Red Chasselas, Muscatel, Sweetwater, Isabella.
Cherry.—Governor Wood, Black Tartarian, Cleveland Bigarreau, Napoleon Bigarreau, Black Republican, May Duke, Early Purple.
Plum.—Coe's Golden Drop, Imperial Gage, Green Gage, Yellow Egg, Jefferson, Washington, Bradshaw, Smith's Orleans, Kelsey Japan, Blue Damson.

Prune.—French, German, Fellenberg, Hungarian, Silver.
Fig.—Smyrna, Black California, White Ischia.

SAN DIEGO COUNTY.

Report of O. S. Chapin, Poway.

MOST PROFITABLE FRUITS GROWN.

Peaches, apricots, prunes, quinces, pears, figs, olives, lemons, oranges, raisin and table grapes.

RECOMMENDED FOR PLANTING.

Those of the list checked *, also Muir, Wheatland, Thissell's, Late Free, Parker's Seedling, and Seller's Cling peaches, and St. Ambroise apricot. Very many varieties are in the experimental stage, and a good number promise well.

NEW FRUITS.

A seedling of the Saucer peach, blossoming in January, and ripening fruit in the middle of June; several times larger than the Saucer peach; regular shape; white; freestone; fine flavor; very promising. Carissa Grandiflora, or Natal plum, from South Africa, not yet fruited. Parker's Seedling peach; seedling of Early Crawford, but much finer.

LEADING VARIETIES.

Orange.—*Washington Navel, *Mediterranean Sweet, Seedlings.
Lemon.—*Eureka, Seedling, Sicily.
Olive.—*Mission, *Picholine, (?) Redding.
Walnut.—*Praeparturiens, Soft Shell, English.
Table Grape.—*Rose of Peru, *Black Hamburg, *Flame Tokay, *Emperor, *Black Cornichon, *Morocco, *Malvoise.
Apple.—Early Harvest, *Red Astrachan, *Fall Pippin, *Gravenstein, *Jonathan, Skinner's Pippin, *Rhode Island Greening, Roxbury Russet, *White Winter Pearmain, *Yellow Bellflower, *Yellow Newtown Pippin, Transcendent Crab.
Peach.—*Alexander, Briggs' Red May, *Hale's Early, *Early Crawford, *Early Rivers, *Late Crawford, *Foster, *Salway, *Lemon Cling.
Apricot.—*Early Royal, Moorpark, Large Early.
Pear.—*Bartlett, Winter Nelis, *Beurre Hardy, *Souvenir du Congress, *L. B. de Jersey, *Seckel, *P. Barry, *Easter Buerre.
Plum.—*Damson, *Kelsey.
Prune.—*Petite d'Agen, *Hungarian.
Fig.—*White Smyrna, *Purple Ischia, Black California, *Brown Smyrna, *San Pedro, *White Adriatic, White Marseilles.

Report of J. Z. Adams, Valley Center.

This locality is comparatively newly settled by people of no means, hence very little fruit is as yet grown to maturity. Still, I find in five years experience, that our upland mesa or brush land, when thoroughly cultivated, is the best fruit land. It produces less than bottom or valley land, still the yield is abundant and the quality unexcelled.

The leading fruits grown here are apples, peaches, oranges, and lemons. Small fruits do very well in this section, but are only grown for home consumption.

Report of Geo. S. Irish, Elsinore.

The leading fruits grown here are the apricot, orange, prune, apple, peach, raisin grape, and fig.

RECOMMENDED FOR PLANTING.

Apricot.—Large Early, Blenheim, Royal.
Orange.—Washington Navel, Mediterranean Sweet.
Grape.—Any kind (choice); all do well.
Fig.—Smyrna, White Ischia. This question we are not yet able to answer. (Experimenting myself with several varieties.)
Olive.—Mission, first and last.
Peach.—Smock, Early Crawford, Late Crawford, George IV, Orange Cling.

VARIETIES AND OBSERVATIONS.

Apple.—Yellow Newtown Pippin, Jonathan, Yellow Bellflower, Red Astrachan, Smith's Cider, Rhode Island Greening, White Winter Pearmain.
Peach.—Early Crawford, Late Crawford, Susquehanna, Mixon Cling, Orange Cling, Salway, Foster, George IV, Smock, Stump the World, Lemon Cling.
Pear.—Bartlett, Winter Nelis, Keiffer, La Conte, Beurre Hardy. Only few trees in colony, chiefly Bartletts.
Prune.—Petite d'Agen; several trees in small lots scattered in colony. Does well in moist lands near lake, and bears abundantly; fruit large and No. 1 in every respect.
Fig.—Black Mission or California, White Ischia, Brown Turkey, Adriatic, Smyrna. The fig does well. Some of the White Ischia were this season dried by Mrs. Irish, and found, though small, to be of excellent quality. Trees bear well, and fig culture in this colony promises to be one of the chief industries.
Orange.—Washington Navel, Mediterranean Sweet. Several hundred trees out; all doing well. Fruit large, clean, and excellent; no signs of smut or scale.
Plum.—Yellow Egg, Damson, Green Gage.
Small Fruits.—Small fruits are grown on moist land around the lake, which locality is well adapted to the growing of small fruits. Many persons are in the vegetable business, but as yet none have gone into small fruits, as a business, though they grow well and bear abundantly, and some day, ere long, small fruits will be grown extensively.

Report of J. H. Bush, Fall Brook.

The leading fruits grown in this district are: apples, pears, prunes, apricots, oranges, lemons, and peaches; and none have failed to do well here. We think this section especially adapted to the orange, lemon, olive, fig, apricot, pear, and peach, being besides the home of the grape. California certainly cannot present a more perfect fruit land than Fall Brook, as our oranges, lemons, pears, plums, peaches, figs, black grapes, and many other superb specimens prove.

LEADING VARIETIES.

Walnut.—English, Softshell, Black.
Table Grape.—Hamburg, Muscat, Flame Tokay, Seedless Sultana.
Olive.—Picholine (?) (Redding), Mission.
Apricot.—Moorpark, Royal.
Plum.—Kelsey Japan.
Prune.—French.
Fig.—White Adriatic, White Smyrna, Black Spanish, Brown Turkey.
Apple.—Yellow Bellflower, White Winter Pearmain, Baldwin, Winesap, Fall Pippin.
Peach.—Early Crawford, Late Crawford, Smock's Late Free, Smock's Cling, George IV.
Pear.—Bartlett.

Report of R. J. Montgomery, Fruitland.

The leading fruits grown in this district are apricots, peaches, oranges, lemons, olives, pears, and apples. I think blackberries would pay well if given proper cultivation. The mulberry, I think, should also be tried for profit; also guavas. Wilson's Early and Monarch of the West strawberries do very well and pay to grow.

VARIETIES.

Apple.—Early Harvest, Red Astrachan, Sweet Bough, King of Tompkins County, Rhode Island Greening, Smith's Cider, Ben Davis, Golden Pippin, Yellow Bellflower.
Peach.—Strawberry, Early and Late Crawford, Lemon Cling.
Pear.—Bartlett, Comet, Winter Nelis.
Cherry.—Do not think they are a success here, but believe they are back in the mountains.
Plum.—Not extensively raised. I do not think there are many planted, but think they should succeed.
Fig.—Both black and white varieties do very well in this section.

SAN LUIS OBISPO COUNTY.

Report of E. W. Howe, Morro.

All varieties of fruits and vines do well in this district, except cherry, walnuts, and almonds (although the hardshelled almond does well in some localities). Oranges, lemons, and limes do well near the foothills of the Santa Lucia range of mountains, called the thermal belt. No fruits or vines flourish near the ocean on account of the cold wind and damp fogs.

SACRAMENTO COUNTY.

Report of W. S. Manlove, Routiers.

The leading fruits raised for profit in this fruit-growing section are the cherry and Bartlett pear.

LEADING FRUITS AND VARIETIES.

Apple.—Most of the leading sorts.
Peach.—Early Crawford, Late Crawford, Alexander, Red Cling, Orange Cling, Salway.

Pear.—Bartlett, Winter Nelis, Beurre Clairgeau.
Cherry.—Early Purple Guigne, Knight's Black, Black Tartarian, Napoleon Bigarreau.
Plum.—Cherry, Peach, Columbia, Pond's Seedling, Duane's Purple, Royal Hative.
Prune.—Petite D'Agen, Silver, Tragedy.
Fig.—Black, Brown Ischia, White Smyrna.

Report of A. T. J. Reynolds, Waluut Grove.

In this splendid fruit district the orchards are confined to the banks of the Sacramento River, where for a distance of upwards of twenty miles may be seen continuous orchards containing the choicest varieties of apples, apricots, cherries, peaches, plums, and pears. Our facilities for shipping are unexcelled, as there are daily steamers landing at the various orchards, for San Francisco and Sacramento. The orchardist can avail himself of the opportunity offered by the California Fruit Union, and ship his fruit to the cities east of the Rocky Mountains, at his own risk, and promptly get his returns for the same. A start has been made in this district toward this direction, and will doubtless largely increase.

MOST PROFITABLE FRUITS GROWN.

Early apples, more especially Astrachans, apricots, peaches, cherries, plums, prunes, and pears.

NEW FRUITS.

Tragedy prune, a variety that originated with Mr. O. R. Runyon, Courtland; very early, sweet, large size, and good for eastern shipment or drying. Crawford Cling peach, introduced by Mr. Runyon; a few days later than Early Crawford, which it resembles.

FRUITS RECOMMENDED.

Apple.—Red Astrachan, Bellflower, Twenty-Ounce Pippin.
Peach.—Alexander, Hale's Early, Early Crawford, Late Crawford, Susquehanna, Orange Cling, Salway.
Apricot.—Royal.
Cherry.—Early Purple Guigne, Black Tartarian, Royal Ann.
Pear.—Bartlett.

LEADING VARIETIES IN DISTRICT.

Apple.—Red Astrachan, Yellow Bellflower, Twenty-Ounce Pippin.
Peach.—Alexander, Hale's Early, Early Crawford, Late Crawford, Susquehanna, Orange Cling, Salway.
Pear.—Bartlett, Beurre Clairgeau, Beurre Hardy, Seckel.
Cherry.—Black Tartarian, Early Purple Guigne, Royal Ann.
Plum—Purple Duane, Bradshaw, Columbia, Washington, Coe's Golden Drop.

SOLANO COUNTY.

Report of C. Allison, Elmira.

Heretofore fruits have been planted only in small patches—mixed varieties and poorly cultivated. The low price of grain has diverted attention to fruit. There are now numbers of orchards one, two, three, and four

years old, of standard varieties of fruits, and so far promise well; the fruit of those in bearing being superior.

FRUITS CHIEFLY GROWN.

Peaches, apricots, pears, prunes, plums, grapes, figs, and almonds.

RECOMMENDED FOR PLANTING.

Fruit business is almost too new in this district for varieties to have been fairly tested. Orange Cling, Foster, Early Crawford, Muir, Salway peaches bear well, of good size and superior flavor. Apricots, Royal; Bartlett pears; Rose of Peru, and Muscat grapes, Black Mission figs.

Cherry.—Grown only in gardens.

Plum.—Washington.

Prune.—Silver, French.

Fig.—Mission.

Apple.—None grown for market purposes. Some few trees planted, but not yet in bearing.

Peach.—Susquehanna, Early Strawberry, Early Crawford, Foster, Muir, Orange Cling, Salway.

Pear.—Bartlett, Winter Nelis, Glout Morceau; pears just coming into bearing.

SONOMA COUNTY.

Report of Robert Howe, Sonoma.

Grapes are the leading product in this valley, and the township of Sonoma. I expected to get the number of acres from the County Assessor, but have not succeeded. I was told that Colonel Hooper had sent for the same, and will probably forward this information to you. About three quarters of all our grapes are wine grapes, and of the best quality.

PROFITABLE FRUITS.

We might class the prune, pear, olive, peach, and grape as the most profitable fruits raised.

FRUITS RECOMMENDED.

The fruits I would recommend for planting, all things considered, are apples, prunes, Tokay grapes, and in the upper part of the valley the olive.

NUMBER OF TREES IN DISTRICT.

This is about the total number of trees planted in the district: apples, three thousand six hundred; peaches, seventeen thousand, nearly all in bearing; pears, seventeen thousand five hundred, about three quarters Bartletts; cherry, three thousand four hundred; plums, prunes, and figs have been very largely planted throughout the valley. Eden Dale Ranch has about three thousand five hundred quince trees; about two thousand almonds; about one thousand two hundred walnuts, and about five hundred oranges. Many olive trees have been planted, but as yet few are in bearing. Colonel Hooper manufactures a superb article of olive oil. His orchard is in the upper part of the valley.

Report of A. G. Leigh, Geyserville.

Geyserville, formerly Chairville, is in the Russian River Valley, on the San Francisco and North Pacific Railroad, and about seventy-five miles from San Francisco. We have eastern railroad connections at Santa Rosa. This is one of the most beautiful valleys in the State. We have very little fog, being cut off at Healdsburg from the lower valley by rolling hills. Have an average rainfall of thirty inches. As rich land as can be found, and a climate unsurpassed. The fruits chiefly grown in this district, are pears, prunes, peaches, and cherries. What I would recommend for planting are about as follows: Peaches, prunes, pears, and cherries, because they have been largely planted and pay well, but we think the day will come when this section will produce large and paying quantities of olives, walnuts, almonds, figs, and table grapes.

VARIETIES RECOMMENDED.

Peach.—I would recommend Early Crawford, Orange Cling, and Lemon Cling; Muir and Salway do well.

Pear.—The Bartlett does best.

Prune.—The French is the most profitable.

Cherry.—The Black Tartarian and Napoleon Bigarreau are the most profitable at present.

VARIETIES IN GENERAL CULTIVATION.

Apple.—Apples do well, but as we have little fog in the summer time, the codlin moth is bad; but few new trees are being planted.

Peach.—These do exceedingly well, being one of our leading crops. We grow as good peaches as any part of the State.

Pear.—Pears, and especially the Bartlett, are very fine; the trees are thrifty growers and the fruit is very large, fine flavored, and stand shipment.

Cherry.—We grow fine cherries on our upland. Mr. Bonton, our local nurseryman, has a large orchard that pays well; he is propagating twenty-five thousand Centennial cherry trees this season.

Walnut.—I think they would bear well in land well suited for such trees, because there are now two old walnut trees in this place that bear well.

Olive.—Quite a number of olive trees have been planted in this district within the past two seasons; they have so far made splendid growth.

Plum.—Do well.

Prune.—Prunes are one of our leading crops. They do exceedingly well, and thousands of French prune trees are being planted each year.

Fig.—There are a few fig trees in the valley, principally the Mission. They do very well. This season quite a number of White Adriatics were planted.

Report of W. A. T. Stratton, Petaluma.

Our climate is not suited for very early or tender fruits. But few peaches do well. Citrus culture is attracting attention. We are always assured of good crops of apples, pears, plums, and cherries; our location for these being second to none in the State. Apricots not so certain. Almonds extremely doubtful.

FRUITS RECOMMENDED.

All varieties of apples, pears, and Oxheart and Bigarreau cherries, raspberries, blackberries, gooseberries, currants, apricots, Japan persimmon, strawberries, and all hardy plums.

LEADING FRUITS GROWN.

Apple.—Early Harvest, Gravenstein, Red Astrachan, Rhode Island Greening, E. Spitzenberg, Yellow Newtown Pippin, White Winter Pearmain, Yellow Bellflower, Wagener.

Peach.—Early Crawford, Early York, Late Crawford, Old Mixon Cling, Lemon Cling, George's Late.

Pear.—Bartlett, Clapp's Favorite, Dearborn's Seedling, Seckel, Flemish Beauty, Winter Nelis, Le Conte, Keiffer's Hybrid, Duchesse d'Angouleme.

Cherry.—Napoleon Bigarreau, Black Eagle, Black Tartarian, Governor Wood, Knight's Early Black, May Duke, Late Duke.

Plum.—Bradshaw, Cherry, Coe's Golden Drop, Columbia, Smith's Orleans, Jefferson, Peach, Washington, Yellow Egg, Kelsey Japan.

Prune.—Fellenberg, French, German, Hungarian, Silver.

Fig.—Mission.

Table Grape.—Black Hamburg, Flame Tokay, White Sweetwater, Concord, Malaga, Rose of Peru, Isabella, Catawba.

Report of J. Gregson, Sebastopol.

The remarks made below are applicable to this township (annually), so far as I can ascertain. There is a diversity of climate in the township, the southwestern part being affected by the coast fogs, where it is difficult to raise any kind of fruits.

NEW FRUITS.

One variety of peach, named the Wiley Cling, the largest peach we raise, and the Bethel and Bennick apples, both winter apples.

FRUITS RECOMMENDED FOR PLANTING.

Apples, pears, peaches, plums, quinces, cherries, nectarines, Kelsey Japan plums, blackberries, strawberries, raspberries, and table grapes.

Small Fruits.—Small fruits are plentiful, consisting of blackberries, strawberries, raspberries, gooseberries, and dewberries.

In forming this report I have been assisted by my neighbors, H. Marshall, Jesse Hunt, Mr. Huntly, and others.

VARIETIES GROWN IN DISTRICT.

Apple.—Red Astrachan, Gravenstein, Yellow Newtown Pippin, Bevan's Favorite, Rhode Island Greening, King of Tompkins County, Yellow Bellflower, E. Spitzenberg, Roxbury Russet, Red-Cheeked Pippin, White Winter Pearmain, Northern Spy, Virginia Greening, Wagener, Bennick.

Peach.—Alexander, Hale's Early, Early York, Early Crawford, Late Crawford, Susquehanna, Orange Cling, Wiley Cling, Salway.

Pear.—Bartlett, Beurre Clairgeau.

Table Grape.—Black Hamburg, Sweetwater, Chasselas, White Muscat, Black Muscat, Muscat of Alexandria, Flame Tokay.

Walnut.—Not profitable in this district; they are very poor bearers.
Cherry.—Royal Ann, Belle Magnifique.
Plum.—Peach, Washington, Columbia, Yellow Egg, Coe's Golden Drop.
Prune.—French, Gross, Silver.

Report of G. N. Whitaker, Santa Rosa.

The leading fruits grown in this district are: late fall and winter apples, Bartlett pears, French prunes, table and wine grapes, and these are about what I would recommend.

VARIETIES MOST LARGELY GROWN.

Apple.—Yellow Bellflower, Gravenstein, Red Astrachan, Twenty-Ounce Pippin, Baldwin, Yellow Newtown Pippin, Ben Davis, Clyman Pippin, Fall Pippin, Spitzenberg, Smith's Cider.
Peach.—Late Crawford, Early Crawford.
Pear.—Bartlett, Winter Nelis.
Cherry.—Gov. Wood, Black Tartarian.
Plum.—Egg, Coe's Golden Drop, Jefferson, Washington.
Prune.—Petite d'Agen, Oregon Silver Prune.
Fig.—Common Black.

Report of C. A. Bodwell, Jr., Lakeville.

There is as yet very little land in this immediate vicinity devoted to fruit raising, the principal agricultural pursuit being the raising of wine grapes; however, the planting of trees is attracting more attention than heretofore. Nearly every land owner has a small orchard of mixed fruits for family use.

FRUITS RECOMMENDED FOR PLANTING.

The French prune and Bartlett pear on any heavy soil, such as adobe, make good growth and bear heavily. Apples and late peaches do well on lighter soil. Plums do remarkably well, as well as the prune.

VARIETIES GROWN.

Apple.—Yellow Newtown Pippin, Baldwin, Gravenstein, Yellow Bellflower. In the absence of the high temperature so frequent in the interior valleys, nearly all the varieties of apples do well, where the codlin moth is kept in subjection.
Peach.—Orange Cling, Salway.
Pear.—Bartlett, Duchesse d'Angouleme.
Cherry.—Napoleon, Black Tartarian, Governor Wood, Rockport.
Plum.—Coe's Golden Drop, Columbia, Jefferson, Yellow Egg.
Prune.—Oregon Silver, Gross, Petite d'Agen.
Fig.—California Black.

Report of C. P. Nolan, Occidental.

We have some of almost every variety of wine grapes, and are gradually working our vineyards into the choicest varieties. We are troubled but very little with pests, with the exception of the codlin moth, which we are trying by every means to exterminate.

MOST PROFITABLE FRUITS GROWN.

Wine grapes, apples, peaches, apricots, Bartlett pears, plums, prunes, and cherries.

VARIETIES RECOMMENDED FOR PLANTING.

Apple.—Baldwin, Hoover, Bethel, Northern Spy, Cook's Seedling, Spitzenberg.
Cherry.—Royal Ann.
Peach.—Early Crawford, Hale's Early, Alexander.
Pear.—Bartlett.
Plum.—Jefferson, Washington, Coe's Golden Drop.

VARIETIES IN GENERAL CULTIVATION.

Apple.—Hoover, Swaar, Yellow Newtown Pippin, Rhode Island Greening, Gravenstein, Yellow Bellflower, White Bellflower, Baldwin, Red Astrachan, Spitzenberg, Cook's Seedling, Rome Beauty, Bethel.
Peach.—Early Crawford, Late Crawford, Orange Cling, Hale's Early, Alexander, Early Strawberry, Salway.
Pear.—Bartlett, Seckel.
Cherry.—Royal Ann, Black Tartarian.
Plum.—Coe's Golden Drop, Jefferson, Washington.
Prune.—Hungarian, French.
Table Grape.—Black Hamburg, Flame Tokay, Catawba, Rose of Peru, Sweetwater, Black Malvoisie, White Muscat, Black Muscat.

Report of Dr. A. F. White, Santa Rosa.

Fig Culture.—After listening attentively to the discussion concerning the specimen of figs which Mr. Parker exhibited at the meeting of the State Horticultural Convention in Chico, I determined to follow up the investigation, and, if possible, ascertain something reliable of its history and real merits. I was sorry that I could not get a specimen of the fruit, so as to make a partial personal examination of the pulp, seeds, and such other characteristics as might have appeared.

There can be no doubt that the fig was introduced into California by the proprietors of the San Francisco "Bulletin" some years ago, from Smyrna. This ancient and important city of Asia Minor gave name to the gulf at the head of which it stands, and to an extensive and productive country with which it is surrounded. The fig is grown in every part in the greatest abundance, and enters largely into the food of the people, and is a prominent article of export.

The City of Smyrna has a population of about one hundred and fifty thousand, consisting of Turks, Jews, Greeks, Americans, and French. The English have constructed a railroad in a southeasterly direction eighty-one miles to Aiden, an important inland commercial city. Another railroad runs further to the eastward sixty-one miles to Cassaba, and terminates twenty-two miles further on at Alasker—the Philadelphia of sacred history. The country thus opened to the commerce of the world is diversified with hills and plains; has a growing population, and a fertile soil. It is a remarkable fact that it extends through exactly the same degrees of latitude with Central California, and produces many of the same grains, fruits, nuts, and flowers.

The excellence of the Smyrna fig is known and universally acknowledged. There are many varieties of superior quality, all of which outside of Smyrna are called "Smyrna" figs. In Smyrna they are called "Turkey" figs, probably from the fact that in past ages they may have come from some parts of Turkey proper. In addition to these general appellations many varieties have specific names, often indicating some distinguishing characteristic or supposed excellence. Among these, and perhaps preëminent to all in its good quality, is the "Elemi" fig. The term "Elemi" is the same in Italian, Spanish, and English, and differs only in accent and pronunciation in French. It is the name of a fragrant resinous substance obtained from a family of trees found in Mexico, Brazil, Ethiopia, and other tropical countries, and was once an article of commerce in the Levant. It is of a pale yellow color, semi-transparent, and has a fragrance similar to that of the fennel; it is used medicinally. The figs exhibited by Mr. Parker were a pale yellow color, and were transparent when held between the eye and the sunlight. The similarity in these two points is so exact that the name "Elemi" is appropriate to that fig, and probably was originally the occasion of the name being given to the most delicious fig in Smyrna. The conclusion is certainly very strongly in favor of Mr. Parker's fig being the true "Elemi" fig of Smyrna.

If my investigations are correct, Mr. Parker will be benefited in proportion to the reputation of the "Elemi" fig abroad. It will also be a fact of much interest to the fruit growers of California that one of the best figs in the world is grown in this State, and may soon be cultivated in every orchard and its delicious fruit be upon every table.

I have written thus freely, hoping that if I have fallen into any error your greater knowledge of the subject will enable you to detect it at once, and also for the purpose of calling your attention to the fact of the great variety of figs of real excellence grown in Smyrna. I hope if it is proven that the fig exhibited by Mr. Parker is not the true "Elemi," that efforts will at once be made to introduce it; and, further, should it appear that there are one or more varieties in Smyrna or elsewhere superior in flavor, size, and drying qualities to the "Elemi," no time will be lost in introducing them here. In view of the facts above stated, it is suggested that this fig be called, known, and hereafter described as "Parker's Elemi" fig.

Report of William Van Allen, Healdsburg.

This section is particularly adapted to the growing of pears, peaches, Bartlett pears, and prunes; the peach especially seems to attain finer flavor than in some sections. The most profitable fruits grown here are peaches, pears, cherries, and prunes.

NEW FRUITS.

The Centennial and a yellow cherry.

VARIETIES RECOMMENDED FOR PLANTING.

The late varieties of peaches; white cherries, especially Centennial; French prunes, and Bartlett pears.

LEADING VARIETIES GROWN.

Cherry.—Black Tartarian, Napoleon Bigarreau, Governor Wood, Centennial.

Plum.—Coe's Golden Drop, Yellow Egg, Jefferson, Washington, Columbia, Green Gage, Damson.

Prune.—Petite, Silver.

Apple.—Gravenstein, Yellow Bellflower, Red Astrachan, Fall Pippin, Russet, Rhode Island, Baldwin, Spitzenberg, Yellow Newtown Pippin, White Winter Pearmain.

Peach.—Early Crawford, Late Crawford, Salway, Orange Cling, Smock's Late Free, Lemon Cling, Muir, Wager, Lemon Free, Foster, Susquehanna.

Pear.—Bartlett, Souvenir du Congress, Beurre Hardy.

Table Grape.—Sweetwater, Flame Tokay, and in fact all the leading varieties of table grapes.

Report of Mrs. M. E. Overton, Glen Ellen.

The principal fruit growers of Glen Ellen district are: Colonel Hooper, engaged largely in prunes and olives, producing a very high class of olive oil; he also grows table grapes, almonds, walnuts, oranges, and lemons; is renowned for finest prunes, olive oil, and pickled olives. Wm. McP. Hill grows large orchard of cherries, quinces, late plums, apples, pears, and peaches, also Tokay table grapes and wine grapes. Eli Sheppard grows three hundred acres of table and wine grapes, and pears. Kohler & Frohling grow oranges, chestnuts, and large vineyards of wine grapes. Alfred La Motte, general variety of fruits. Mr. Hilton grows wine grapes and best varieties of pears, plums, apples, and peaches. R. Thompson, fine wine grapes, pears, peaches, apples, and walnuts. J. Wagner, wine grapes. Mrs. Justi, fine wine grapes, Bartlett pears, and peaches. Mrs. Williams, apples, peaches, and plums. Mrs. Stewart, apples and peaches. Mrs. K. F. Warfield, late shipping pears and peaches, prunes, apples, Japanese chestnuts, French wine and English table grapes. Basil Warfield, oranges, pears, chestnuts, and figs. J. Chauvet, fine wine grapes. Bella Howard, raspberries, blackberries, peaches, and cherries. J. Lawrence Watson, apples, peaches, pears, plums, figs, oranges, French wine and table grapes. J. H. Drummond, late shipping pears, plums, prunes, apples, nectarines, Japanese chestnuts, filbert nuts, apricots, walnuts, figs, gooseberries, raspberries, French wine grapes, and high class English table grapes. H. B. Carpenter, grapes and fruits. J. K. Luttrell, grapes and fruits. H. F. Tarrant, wine grapes, peaches, plums, and apples.

NEW FRUITS.

P. Barry, Keiffer, Le Conte, and Colonel Wilder pears; Langford, Hyde's King, Late Russian, Red Beitigheimer apples, and Kelsey plums.

LEADING VARIETIES GROWN IN DISTRICT.

Apple.—King of Tompkins County, Hoover, Wagener, Swaar, Rhode Island Greening, Gravenstein, Yellow Bellflower, Lady, Hyde's King, Red Astrachan, Langford, Red Beitigheimer, Baldwin, Late Russian.

Peach.—Alexander, Chinese Cling, Late Crawford, Salway, Muir, Orange Cling, Susquehanna, Lemon Cling, Celler's Cling.

Pear.—Bartlett, Beurre Hardy, Beurre Clairgeau, Easter Buerre, Duchesse d'Angouleme, Winter Nelis, Seckel, P. Barry, Colonel Wilder, Le Conte, Keiffer's Hybrid, Pound Pear.

Cherry.—Black Tartarian, Centennial, Royal Ann, White Oxheart, Reine Hortense.

Plum.—Royal Hative, Coe's Golden Drop, Hungarian Prune, Columbia, Washington, Yellow Egg, Peach Plum, Kelsey Japan, Satsuma, Shropshire Damson.

Prune.—Silver, Hungarian, French, Bulgarian.

Fig.—White Smyrna, Mission, White Adriatic.

SUTTER COUNTY.

Report of H. P. Stabler, Yuba City.

The fruits chiefly grown in this district are peaches, pears, apricots, almonds, plums, prunes, grapes, and figs.

VARIETIES RECOMMENDED.

Peach.—Muir, Orange Cling, Susquehanna, Foster, Tuscan Cling, McKevitt's Cling, Briggs' Red May, Hale's Early.

Pear.—Bartlett.

Grape.—Muscatel, Flame Tokay, Rose of Peru, Seedless Sultana, Black Prince, Bishop, Thompson Seedless.

Almond.—Hatch's.

Plum.—Kelsey.

NEW FRUITS.

We have a few seedling peaches, yet unnamed; also the Thompson seedless grape.

VARIETIES IN GENERAL CULTIVATION.

Apple.—Red Astrachan, White Astrachan, Yellow Newtown Pippin, Jonathan, Yellow Bellflower.

Peach.—Muir, Runyon's Orange Cling, Susquehanna, Tuscan Cling, Salway, Foster, Early Crawford, Briggs' Red May, Late October, Hale's Early.

Pear.—Bartlett, Winter Nelis, Glout Morceau, Easter Beurre, Beurre, Hardy.

Cherry.—Royal Ann.

Plum.—Yellow Egg, Peach, Washington, Green Gage, Tragedy.

Prune.—French, Silver, German, Fellenberg, Italian, Hungarian.

Fig.—White Adriatic.

Apricot.—Royal, Moorpark, Early White, Peach.

Olive.—Mission, Redding (Cal.) Picholine.

Table Grape.—Flame Tokay, Purple Damascus, White Muscat, Black Muscat, Black Prince, Cornichon, Emperor, Bishop, Rose of Peru, Black Hamburg.

Report of C. D. Herrick, Pleasant Grove.

This district, being so far from railroad transportation, is almost strictly a grain-growing one, except for family use. The soil being varied and the climate agreeable, I see no reason why fruit of all kinds should not do well in the hands of those who make a business of it.

The fruits most largely grown here are: peaches, apples, pears, apricots, and grapes. The varieties to be planted should be such as would bear transportation. The leading varieties now fruiting here are about as follows:

Apple.—Early Harvest, Rhode Island Greening, Cluster Crab. (There are several other varieties grown, the names of which I cannot now call to mind.)

Peach.—Briggs' Red Early, Early and Late Crawford, Snow, Indian, Strawberry. (Other varieties too numerous to mention.)
Pear.—Bartlett, Winter Nelis.
Cherry.—Black Tartarian, Rockport Red.
Table Grape.—Flame Tokay, Muscat, Rose of Peru, Black Morocco.
Blackberry.—Early Wilson, Early Crandall, Lawton.
Plum.—Yellow Egg, Kelsey, and a small blue, name unknown.
Prune.—French, Hungarian, Silver.
Fig.—Blue, White Adriatic.

The apricot is perhaps more extensively grown, and thrives very well. The names of the kinds under cultivation unknown. Small fruits are but little grown, although they do exceedingly well, haymaking and harvesting interfering with their proper care at the critical time.

Report of W. T. Spillman, Pennington.

Pennington is situated at the north end of the Marysville Buttes. We have fine land that produces almost any kind of fruit without irrigation. There are orchards here the finest I have ever seen, so I am satisfied that this is a good place for the growing of almost all fruits; we never have frosts. The apricot does perhaps best with us, never having been bothered with insect pests of any kind. All the trees in this section have made exceedingly large growth this year. Early and late peaches are also a good paying crop. The same may be said of the pear, prune, fig, and grape.

NEW FRUITS.

I have a peach, grown from the seed. It is a white cling, very large, fine flavor. The tree is only three years old, and last spring it bore about one hundred pounds of fine fruit. I obtained the seed from a peach that came from the State Fair.

TEHAMA COUNTY.

Report of Albert O. Peden, Corning.

I regret very much not having been able to obtain the desired information, which is of such vast importance, from the leading fruit growers of this county, and have therefore labored under a great disadvantage in the completion of my report.

FRUITS CHIEFLY GROWN.

The leading fruits grown in this district, or county, are prunes, peaches, and grapes. Other fruits of course do well, such as oranges, olives, walnuts, almonds, etc., but as yet are not so largely grown as the former. The Early Harvest apple also pays well.

TULARE COUNTY.

Report of N. W. Motheral, Hanford.

This district grows the grape to perfection. Apples do not do well. Peaches, pears, plums, nectarines, and apricots do as well here as anywhere in the State. Oranges and lemons grow in sheltered places. Apples

ripen too early to be of any value, except the new variety noted in this paper.

FRUITS RECOMMENDED FOR PLANTING.

Peach.—Motheral's Yellow Cling, Susquehanna, Foster, Muir, Salway, La Grange.
Apricot.—Royal, Peach, Eureka.
Prune.—Petite.
Apple.—Red June, White Winter Pearmain, Striped Winter Pearmain.
Pear.—Bartlett, Foster's Winter.

NEW FRUITS.

Motheral's peach, Striped Winter Pearmain apple.

VARIETIES UNDER GENERAL CULTIVATION.

Apple.—Red June, White Winter Pearmain, Rambo, Maiden's Blush, Ben Davis.
Peach.—All the varieties of yellow peaches, and, indeed, all the varieties grown anywhere in the State do well here and are grown.
Pear.—Bartlett, Winter Nelis.
Table Grape.—Rose of Peru, Sultana, Muscat.
Cherry.—Cherries do not do well, and are not planted to any extent.
Plum.—All the varieties planted in the State do well here, but the Petite prune is planted most extensively.
Prune.—Petite.
Fig.—Black California, White Smyrna.

Report of I. H. Thomas, Visalia.

The fruits I would recommend for planting are as follows:
Prune.—Petite Prune d'Agen, Hungarian, German, Silver, Simoni.
Plum.—Columbia, Washington, Yellow Egg, Red Egg, Bradshaw, Wild Goose.
Apple.—Red Astrachan, Red June, Maiden's Blush, Yellow Bellflower, E. Spitzenberg, White Winter Pearmain, Winesap, Ben Davis, Stark's Seedling.
Peach.—All varieties do well here; in fact, Fresno, Tulare, and Kern Counties are the best counties in the State for stone fruits.
Pear.—Bartlett, Winter Nelis, and in fact all varieties do well, the Bartlett always in the lead.
Table Grape.—Flame Tokay, Rose of Peru, Black Hamburg, Purple Damascus, and in fact all varieties do well, as this valley is the home of the grape, and the advantages for raisin making are greater here than in any other part of the State, there being no rain or fogs to contend with.
Nectarine.—This fruit does better here than in any other part of the State. Would recommend Lord Napier, New White, Boston Stanwick, Victoria, Downton, Dodd's Late.
Fig.—All varieties do very well; the White Adriatic leads all others.
Cherry.—The culture of the cherry is very unprofitable, and they are not much grown.
Walnut.—American Forest and Black California walnuts do well. The English walnut is a failure here, the atmosphere being too dry I think.

The foliage falls off in August and then has a new crop of leaves before fall.

Olive.—Not enough have been planted to give a correct opinion.

Orange.—This fruit does well along the foothills in the thermal belt, but will never be a success in the valley.

NEW FRUITS.

The Simoni prune, I believe, will be very profitable for the eastern market, ripening with the Royal Hative plum, and being large (five and a half by six and a half and seven inches in circumference), and a good shipper.

Report of P. Y. Baker, Traver.

The fruits chiefly grown in this section are plums, prunes, peaches, pears, figs, and grapes. As yet this is somewhat of a new fruit-growing section and new orchards and vineyards are being planted. Small fruits are quite extensively grown and pay well.

TUOLUMNE COUNTY.

Report of John Perevia, Jamestown.

The fruits chiefly grown in this district are grapes and peaches. They are scarcely ever known to fail and attain great perfection.

Table Grape.—Sweetwater, Black Ferrara, White Muscat, Flame Tokay, Black Hamburg, Black Prince. All kinds do well.

Apple.—All kinds of apples grow well in this district, and their flavor and appearance are equal to those of any part of the State, excepting some grown at much higher altitudes, such as the mountains above Sonora, but the crop is more sure here than in that locality.

Peach.—No part of the world is better adapted to the cultivation of the peach than this. This has been proven time and again. All kinds do well, from the Early May to the latest known variety.

Pear.—Pears do equally well as with the apple and peach.

Cherry.—All varieties of this fruit do remarkably well.

Plum.—This fruit does well and is a very sure crop; scarcely any disease ever attacks this tree.

Prune.—Same as the plum, sure crop.

Fig.—This district appears to be the natural home of the fig. All known varieties do well, and we challenge this State, or any other, to show as large trees as we can. We have trees the bodies of which are eleven feet in circumference.

TRINITY COUNTY.

Report of P. L. Thomas, Weaverville.

The orchards and farms are small, situated on the lower Trinity and South Fork and New River, consequently fruit is not very extensively raised, but, so far as tried, most varieties grow well and mature properly, and the assorted varieties have a better flavor than in any other place that I am acquainted with. We are not up in horticulture sufficient to know the names of all the leading varieties of fruit that grow here. We are not bothered with fruit pests to any extent. I have noticed the black scale on two trees out of one hundred apple trees. Some varieties of apples do not

set every year; peaches and plums the same. All varieties that we have tried do well. Fruit is not raised in our district for profit, consequently all fruits have the same relative value. If fruits were more extensively raised the most profitable ones would be apples, peaches, plums, pears, prunes, cherries, and grapes.

FRUITS IN GENERAL CULTIVATION.

Apple.—Winter Pearmain (bear every second year), Yellow Newtown Pippin (bear every two years), Rhode Island Greening (every two years), Roxbury Russet, Smith's Cider, Spitzenberg, Red June, Baldwin, Yellow June, Golden Sweet, and other summer apples, all of which do well, and are as good as found in the country.

Peach.—We have such a variety of peaches that I cannot enumerate them by name, but all kinds do remarkably well and grow large, with a good flavor, and by having a great variety peaches are almost a sure crop.

Pear.—The same remarks that apply to peaches will apply to pears; also, the varieties we have tried do remarkably well.

Cherry.—Cherries are not so extensively grown, but so far as tried do very well.

Plum.—Plums of all kinds are very prolific, and mature thoroughly, and are almost a sure crop every year.

Prune.—Prunes do well here, but they have not been planted very extensively up to the present time.

Fig.—Figs have not been tried.

Table Grape.—Grapes of different kinds are now fruiting and doing well, but the hardy varieties do the best. We never have found any mildew on them anywhere in this county.

Small Fruit.—Raspberries do very well, as also blackberries; but the wild ones are of much better flavor, and they grow so extensively that there is not much use planting other kinds.

Report of H. Schlomer, North Fork.

We have here the best kind of fruit, and plenty of it, but there is very little sale for it; to send it down below there is too much expense on it. I will give you, as near as I can, the amount of it in this school district. There is little sale for it this year. I am drying as much fruit as I think I can sell; balance of fruit is fed to hogs. We have green apples all the year round. The fruits chiefly grown here are apples, peaches, pears, plums, and grapes.

Report of C. Frink, Lewiston.

This district is a mining district, and for this reason fruit culture has not been given much attention; however, various orchards have been planted in a small way, mostly for home consumption, and are doing quite well. In sheltered localities, apples, peaches, plums, prunes, cherries, grapes, and small fruits are growing, but only for home market.

VENTURA COUNTY.

Report of R. Robinson, Ojai.

Our valley is in the upper part of the "Ojai." We have no irrigation, and do not require it for the fruit we raise. My orange trees have been bearing two or three years and have done very well without any irrigation;

they are perfectly free from scale. The olive, also, is always clean and bright.

I am of the opinion that the walnut will not bear as well here as on the coast. The tree is a strong grower and makes plenty of wood, but does not seem to bear as it ought.

MOST PROFITABLE FRUITS GROWN.

Apricots, prunes, pears, apples, and the raisin grape. We have in this valley about three thousand apricot trees, mostly of the Large Early variety.

Table Grapes.—No grapes grown expressly for table use, but for wine about ten thousand vines, and for raisins about three thousand vines.

Report of Juventino Del Valle (Del Valle Bros.), Camulos.

I do not know of any locality, with the exception of San Diego, where olives do better than here. As regards almonds, oranges, and limes, will say they do very well and are grown quite extensively, and are profitable to grow.

I would recommend the planting of walnuts, lemons, almonds, olives, oranges, limes, apricots, pears, and peaches. Having had considerable experience in the culture of these fruits, I feel confident in their propagation. Small fruits are only grown to a limited extent for home consumption.

Report of J. Montgomery, Nordhoff.

This district is not, strictly speaking, a fruit district, as fruit is only a success in a small portion of it. I claim, from what I have seen, that grapes, either for wine or for raisins, will prove to be the most paying of anything that can be grown in the fruit line. Oranges do very well when water can be had in abundance. Apricots and grapes are most largely grown.

Report of J. M. Sharp, Saticoy.

Perhaps the most profitable fruits grown here are walnuts and apricots. I would recommend the planting of walnuts, apricots, prunes, and pears, for they do exceedingly well in this section. The Royal apricot, French or Petite prune, and also the Bartlett pear are the most profitable.

VARIETIES IN CULTIVATION.

Apple.—Early Harvest, Red Astrachan, Red June, Golden Russet, Yellow Bellflower, White Bellflower, Yellow Newtown Pippin, White Winter Pearmain, Fall Pippin.

Peach.—Peaches do not prove as satisfactory here as in other parts of the State. Early Crawford bears well, but the quality is not first class. There are some varieties which originated here, but are nothing extra.

Pear.—Bartlett, Howell, Flemish Beauty, Winter Nelis.

Cherry.—Cherries do not bear at all in this county, except a small pie cherry of little value.

Table Grape.—Muscat, Black Hamburg, Mission.

Plum.—This fruit is very uncertain in bearing. I think the Kelsey Japan plum may do well, but is not very well tested as yet.

Prune.—French Petite, French Gross.

Fig.—Large White, Large Purple, Smyrna, Small White, Small Black.

YOLO COUNTY.

Report of J. R. Wolfskill, Winters.

The most profitable fruits grown here are apricots (Royal), peaches, prunes, figs, olives, pears, almonds, grapes (table and raisin). Small fruits are only grown to a limited extent; they do remarkably well, however. Pomegranates, oranges, and English walnuts are also grown quite extensively.

YUBA COUNTY.

Report of B. Sanford, Smartsville.

This locality, near Smartsville, is well adapted to the raising of, canning, and drying fruits. A deep clay loam is found on the hilltops and on the sides. We use irrigation generally for fruit and grain. Early apples do best on account of the codlin moth. The fruits most largely grown are apples, peaches, apricots, figs, grapes, and some oranges.

RECOMMENDED FOR PLANTING.

The fruits (from my observation) that I would recommend for planting throughout this section, are about as follows: Royal apricots, Petite prune, Yellow Cling and Freestone peaches, nectarines for drying, figs, oranges, and raisin grapes.

NOTE.

The above reports represent forty-seven counties, but not complete, some of the largest fruit-growing counties being represented by only one or two reports. It had been expected that every fruit-growing section would be properly represented, but as the reports were not received in time, action could no longer be delayed in the issuance of the report; therefore, what may hereafter be received will be added to the present number in a subsequent issue of a similar publication.

SECRETARY.

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