

ANNUAL REPORT
OF THE
SURVEYOR-GENERAL
OF THE
STATE OF CALIFORNIA

[JAMES ALLEN, STATE PRINTER.

SUBJECTS.

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REPORT.

SURVEYOR-GENERAL'S OFFICE
Sacramento, Jan. 7, 1856.

To His Excellency, JOHN BIGLER,
Governor of California:

Sir:

In compliance with "An Act Concerning the Office of Surveyor-General," I respectfully submit the following report:

The following is a list of the Acts passed by the last Legislature, imposing important duties upon the Surveyor-General:

"An Act to Provide for the Survey and Construction of a Wagon Road over the Sierra Nevada Mountains," approved April 28, 1855.

"An Act to Provide for the Selection of Lands, Donated by the United States to the State of California, for the Support of Common Schools, and for the Erection of Public Buildings," approved May 7, 1855.

"An Act to provide for the Sales of the Swamp and Overflowed Lands, belonging to this State," approved April 28, 1855.

An Act to Provide for Settling the Boundary Line between the Counties of Santa Cruz, Santa Clara and San Francisco," approved May 2, 1855.

"An Act to Establish a Prominent [Permanent] Boundary Line between the Counties of Stanislaus and Tuolumne," approved May 4, 1855.

The "Act Concerning the Office of the Surveyor-General," passed April 17, 1850, besides many other important requirements, contains the following: "When called upon by the county authorities of any county, he shall run any boundary line, or portion of a line, between such county and an adjoining county."

I. REQUIRED AND ACTUAL APPROPRIATIONS.

To have enabled the Surveyor-General properly to perform the duties assigned him in the above named Acts, there should have been appropriated:

For explorations and surveys under the Immigrant Wagon Road Act	\$15,000
For expenditures under the Act for Selection of Lands, and the Act for Sale of Swamp and Overflowed Lands	10,000
Amount carried forward	\$25,000
Amount brought forward	\$25,000
For survey of County Boundaries, etc.	10,000
Total required appropriation, exclusive of contingents and salary.....	\$35,000
Deduct amount appropriated	00,000
Anticipated excess of required, over actual, appropriations	\$35,000

As the salary of the Surveyor-General is but \$2,000 is State Scrip – equal to about \$1,400 cash – not enough to pay his own expenses; and as he is not entitled to, and never has received, a single fee since he has been in office, it need not excite special wonder should it appear that he has been unable to perform, in a satisfactory manner, many of the important duties imposed upon him.

II. THE IMMIGRANT WAGON ROAD.

1. THE EXPLORATIONS, AND EASTERN BOUNDARY SURVEY.

In my former report, an appropriation of one hundred thousand dollars was recommended, for the purpose of locating and constructing the portion or portions of the proposed California and Missouri Stage Road, lying between some point or points in the great central valley of this State and its eastern boundary, and for other surveys to be made in connection therewith, with a view of ascertaining the practicability of the routes examined for a railroad; and the opinion was expressed that this was the most judicious manner in which the State could aid in establishing communication by a line of stages with the Atlantic States.

An Act entitled "An Act to provide for the Survey and Construction of a Wagon Road over the Sierra Nevada Mountains," passed the last Legislature, near the close of the session, from which I make the following extracts:

"The Surveyor-General of the State shall cause to be surveyed, a good wagon road over the Sierra Nevada Mountains, at an expense not to exceed five thousand dollars; and no further liability shall be incurred for this purpose."

"The Governor, the Secretary of State, and the Surveyor-General," were constituted a "Board of Commissioners," and were "required to located said road, at the earliest practicable day, following, (in their judgment,) the most practical [practicable] and economical route, and if possible, to have said road so far completed as to make it beneficial to the immigration of the present year," [1855.]

"For the purpose of paying contractors," for the construction of the road, it was "made the duty of the Treasurer of the State to cause to be issued, Bonds of the State, not to exceed one hundred thousand dollars."

Knowing that the Bill required an impossibility, viz: the location of the road on the "most practicable and economical route, at an expense not to exceed five thousand dollars," and fearing it might consequently prove an abortion, I reluctantly sent a communication to the Legislature, from which, as it was not deemed worthy of a place upon the journals of either branch of that honorable body, I am induced to extract the following:

SURVEYOR-GENERAL'S OFFICE
Sacramento, April 23, 1855

To the Honorable the Legislature of the State of California:

The undersigned begs leave most respectfully to submit to your honorable body the following suggestions in regard to the Immigrant Road Bill, which only awaits the signature of the Governor to become a law:

The Bill limits the expenditure for surveys, to five thousand dollars, a sum not sufficient for the purpose for which it is appropriated.

No engineer can do justice to his reputation or to the State, in the location of the road, if limited to the above named sum, and no engineer of ability will risk his reputation by asserting the contrary.

In justice to the State, as well as to myself, I respectfully request that a supplemental bill may be passed, containing, after the limiting clause, the words: "except by unanimous consent of the Commissioners;" by which a very objectionable feature will be removed, while there will be no more reason to anticipate a wasteful expenditure in locating than in construction the road.

On its location depends, not only the cost, but the utility of the road." * *

"With great reluctance, and in obedience to what I consider an imperative duty to the State, as well as to myself, do I send in the above suggestions, actuated alone by the desire to see restored to its once fair proportions, a Bill destined, I trust, to reflect honor only upon its friends.

I am, with great respect,
Your Obedient Servant,

S. H. MARLETTE,
Surveyor-General."

The Bill having become a law, it only remained to do the best that the circumstances of the case would permit.

During the latter part of May, having occasion to make purchases preparatory to the commencement of the reconnaissance, I was informed that no accounts would be audited under the Act, without authority from the Controller, who was then absent on official business.

On the 23rd of May the Act was submitted, by me, to the Attorney-General, with the following questions: "Will this Act render it obligatory upon the Controller to audit accounts of expenditures for surveying or construction, or both? and if for the former, is the certificate of either of the other Commissioners necessary, so far as the surveying appropriation is concerned?"

On the 25th the following opinion was received, dated the 24th:

"In regard to the 'Act to provide for the Survey and Construction of a Wagon Road,' etc., I think the second section does distinctly, though indirectly, appropriate the sum necessary for the payment of the contractors; and I infer from the context of the Act, that the sum of \$5,000 is also appropriated for the payment of the expenses of the survey.

That the Legislature intended it to received this construction, is shown by the last section, which declares that 'all liabilities authorized and incurred under, and by virtue of, the provisions of this Act, shall be paid out of the appropriation made by this Act.'

The conclusion to which I arrive is, that the Act appropriates the sum of \$100,000 for the payment of contractors, and \$5,000 for the payment of the expenses of the survey; and that the Controller is authorized to audit the accounts of the contractors and Surveyor, and issue warrants for the same.

A grave doubt, as to the constitutionality of the Act itself was suggested by the Governor in his message of approval, (if it can be so called,) and I would advise that no steps be taken under the Act, until a judicial decision can be had on the question of its constitutionality.

J. R. McCONNELL,
Attorney-General.”

Believing it to be necessary to comply, as strictly as possible, with the requirements of the Act, leaving to those so disposed the task of testing its constitutionality, the purchases were made, the certified accounts, accompanied by the opinion of the Attorney-General, sent to the Controller’s office, when information was received that they could not be audited in the absence of the Controller, the law requiring that “no warrants shall be drawn on the Treasury, except there be an unexhausted specific appropriation by law to meet the same.”

Indulging the hope that the Controller would take a more favorable view of the Act when he should return, temporary relief was sought by drawing on the Contingent Fund. Those of whom the purchases were made, had been assured that warrants were worth eighty-three per cent., and the warrants were drawn with that understanding, but on being offered for sale, would bring but sixty, as they could be neither funded nor registered for redemption. I therefore took the warrants myself, and advanced the funds necessary to defray the expense of these and subsequent purchases, made prior to July 1st; it being anticipated that warrants to be issued for expenditures incurred after that date – as they would be subject to registry and redemption – would be much more valuable.

If all the funds provided to carry on the operations of this office, had been disposed of before that date, there would have been realized \$821 26, about sufficient to pay for stationary, fuel, lights, etc. By waiting until after July 1st, \$1,026 58 were realized.

The accounts for rent have since (mostly) been audited by the Controller.

With the above exceptions, all the financial affairs of this office have been carried on independent of the State Treasury.

Having learned, on the 4th of June, that the Controller had returned, I addressed him the following communication, which was transmitted on the 5th:

“SURVEYOR-GENERAL’S OFFICE,
Sacramento, June 4, 1855.

Hon. SAM. BELL, Controller of State:

Sir:

I have the honor herewith to transmit a copy of ‘An Act to Provide for the Survey and Construction of a Wagon Road over the Sierra Nevada Mountains,’ and respectfully request that I may be informed whether any accounts will be audited under said Act.

Having made some purchases preparatory to the commencement of a reconnaissance of the routes for said road, I was informed during your absence, that no

accounts could be audited under the Act, whereupon I applied to the Attorney-General for his opinion in the matter, which I also transmit for your consideration.

Allow me to request an answer at your earliest convenience, as the Board of Commissioners now only await your decision to know what steps to take in this important matter.

Be kind enough to return with your answer, both the Act and the opinion, and greatly oblige,

Very respectfully,
Your Obedient Servant,

S. H. MARLETTE
Surveyor-General

On the same day the following reply was received:

“OFFICE OF CONTROLLER OF THE STATE,
Sacramento, June 5, 1855.

S. H. MARLETTE, Surveyor-General:

Sir:

Your favors of this day are at hand, and your requests will be attended to on return of the Controller, who left the city this morning.

Respectfully yours,

ELAM CONVINGTON
Clerk Controller's office.”

On the same day also, Dr. Bradley, of Diamond Springs, left this city for the purpose of finding the best route for a road over the Sierra Nevada, in the neighborhood of the South Fork of the American River, and of opening a trail and finding crossing places over the streams, along or near said route, in order that the Commissioners might be able, without too much delay, to see the most practicable route in that region.

The expense was to be defrayed by subscription; and I had assured the Doctor that so soon as he should report himself in readiness, I (and probably the other Commissioners) would accompany him across the Sierra Nevada. On the 11th he wrote the following from Diamond Springs; “I start to-morrow morning with the necessary party to open the trail, and will advise you immediately on return.”

The opinion had been entertained that the Commissioners would go over the several routs, and select (in their judgment) the most practicable and economical one; or, if necessary, select two or more, for a more thorough examination, to enable the Board to decide properly upon their relative merits, and that, *after the selection of the route*, it would devolve upon the Surveyor-General of the State to cause to be surveyed a good wagon road, upon the same.

The following communication was received on the 9th of June:

“To the Hon. S. H. MARLETTE, Surveyor-General:

Dear Sir:

I have the honor to inform you that at a regular meeting of the Board of Wagon Road Commissioners, held in the City of Sacramento, on the 9th day of June, 1855 – present, His Excellency, Governor Bigler and Surveyor-General Marlette – the following resolution was passed:

Resolved, That the Surveyor-General of the State of California be, and he is hereby instructed, to make such explorations as may be necessary to enable him to estimate the expense of constructing a good wagon road, upon the various practicable routes across the Sierra Nevada Mountains, in this State, and to report the same to this Board, together with all the facts necessary to enable the Commissioners to select the most practicable and economical route.

I remain, very respectfully,
Your Obedient Servant,

CHARLES H. HEMPSTEAD
Secretary of Board of Wagon Road Commissioners.

Sacramento, June 9, 1855.”

Shortly after the adjournment of the Legislature I opened a correspondence with the Hon. Sherman Day, the object and result of which was to secure his services in the exploration and surveys to be made under the Wagon Road Act. He had just arrived at Sacramento, and was awaiting orders at the date of the above resolution.

The resolution passed on Saturday, and on the following Monday Mr. Day left this city for Georgetown, to commence the explorations; (it having been previously arranged with the Hon. John Conness, that the citizens of that place should have a suitable party organized and provisioned to accompany, at their expense, myself or my appointee, over their route,) and from that time to this (the 7th of January, 1856) Mr. Day has been almost constantly engaged upon either the explorations or surveys, under circumstances well calculated to discourage and disgust.

In his report of September 20th, constituting Appendix A, No. 1, to which I respectfully refer, will be found a statement and description of the routes examined by him.

To neutralize the effect of certain statements, which might otherwise destroy the confidence of the people in the Commissioners, and thereby render ineffectual my efforts to obtain assistance from the friends of the several routes to explore the same, the following facts were published on the 25th of June;

That no appropriation was made by the Legislature to pay for the survey of the Road; that the Law prohibited the Controller from drawing warrants without an express appropriation; that the Act, though it says \$5,000 may be expended for the survey, does not appropriate the money; that the \$100,000 of bonds to be issued, are exclusively for the payment of contractors, consequently the preliminary examinations and the survey

must be made without funds, and with no security for the payment of the expenses, except the justice of the next Legislature; that under these circumstances the Surveyor-General was necessarily embarrassed in procuring competent aids, as his contingent fund was scarcely sufficient to pay office expenses; but even were it ten times as large, he would not have the means to perform all the duties imposed on him by the last Legislature; that the Acts providing for the selection of the State Lands, and for the sale of the Swamp Lands, make it necessary for him to keep one or two competent draftsmen in his office at all time, yet not a cent has been appropriated to pay them, etc., etc.; and that these were but a portion of the embarrassments under which he labored.

On the 2nd of July a communication from the Controller, dated June 30th, in reply to mine of the 4th of June, was received, stating that he could not audit any accounts under the provisions of the Wagon Road Act.

Dr. Bradley returned on the 3rd of July and reported himself as having been driven from the field by hostile Indians, but not until his object had been nearly accomplished.

In consequence of the Doctor's extremely favorable report upon the advantages of his route, viz: "that by merely riding over it and the other routes, the Commissioners would be able to select his, to the exclusion of all others," I gave him a statement to the effect that, if he would raise the necessary party to enable him, with safety and at a moderate expense, to complete his undertaking, to wit: the opening of a trail over said route, sufficiently to insure for it a fair examination during the coming week, I would urge upon the Legislature the propriety and equity of paying for the same out of the State Treasury.

The Doctor has put a very liberal construction on the above, and sent in bills to the amount of \$2,224 73, to which add \$250, for which bills have been sent in by Mr. Taylor, and \$230 contributed by citizens of Diamond Springs, and other places, and we have as the total cost of *opening a trail over a part of one route*, the enormous sum of \$2,704 73.

I would respectfully recommend that \$500 (which is more than was, or could have been, reasonably anticipated) be appropriated to defray the "moderate expense" incurred "during the coming week" mentioned above. Concerning the balance I have nothing to say.

On the 7th of July, at the request of Hon. Thomas Kendall, Senator from Tuolumne, I sent to him a communication, embodying the substance of what I had stated in conversation to him, and many other gentlemen from various parts of the State, with whom I had met in this city. The following are extracts"

"As you are well aware, the last Legislature unfortunately neglected to appropriate anything for the survey of the great Road across the Sierra Nevada, I am not willing to remain quiet however, until I have selected the best route, made a survey of the same, and laid an estimate of the cost of constructing a good Wagon Road upon it, before the Board of Commissioners.

To do these things requires both men and money, and I know of no other way of obtaining them but to call upon the friends of the various routes to supply the same. On Tuesday next I intend starting for El Dorado County, for the purpose of riding over one

or more routes across the mountains to Carson Valley. In about two weeks, provided I receive sufficient encouragement, it will afford me great pleasure to visit Sonora, and join a party to ride over the route, of the great advantages of which you speak so sanguinely.

The kind of encouragement I want is this: A sufficient party for protection, one or more of whom should be competent guides, familiar with the country to be traversed. I would very much like to have your County Surveyor make one of the party. The expense of the expedition must be defrayed by your citizens.

Should your route be adopted as the only one to be surveyed, the State would undoubtedly be holden for the costs of the same, as I consider myself authorized to use her credit to the amount of \$5,000; but as I am of the opinion that two or three routes will require surveying, and as I am certain that the sum named is not sufficient, I have to use great caution in authorizing expenditures on preliminary examinations. Knowing how anxious you are to have something done in this matter, I leave it to you to represent the same in its proper light to your constituents, and hope to hear from you so soon as you learn what, if anything, can be done."

As the citizens of Sonora had been represented as waiting anxiously, with open purses, to help this project along, I anticipated an early reply to the above; but *none has yet been received*.

Near the close of June I received a communication from Wm. Fowle Smith, Esq., of Camptonville, accompanied by a correspondence between a committee on the part of the citizens of that place and Col. Walter E. Jones, concerning the "Heness Cut-Off" route for the Immigrant Road.

Mr. Smith says: "I am requested by the Committee to say to you and your associates on the Commission, that they will be most happy to render you any assistance, or furnish any information in their power, whenever you commence the reconaissance of the route through this town.

We confidently believe this to be the best route for an Immigrant Road to the Valley of the Mississippi, and hope it will receive a careful examination by the Commissioners of the State."

On the 10th of July I received another letter from Mr. Smith, calling my attention to said correspondence, and requesting a reply and a copy of Colonel Jones' letter, stating that the citizens of Camptonville were anxious to lay the whole correspondence before the people of the State.

The following was sent in reply:

"SURVEYOR-GENERAL'S OFFICE
Sacramento, July 10, 1855.

WM. FOWLE SMITH, Esq., Camptonville, Yuba County

Dear Sir:

Your favor of June 21st, together with the correspondence between the Committee of citizens of Camptonville and Col. Walter E. Jones, in relation to the route

for the Great Immigrant Wagon Road, by the 'Hennes Cut-Off,' came to hand about the last of June.

Your favor of the 6th inst., calling my attention to the above named correspondence, I have just received.

Until quite recently I have not known officially, that the Controller would not audit accounts for surveys under the Wagon Road Act, although, I confess, I was certain of the fact, inasmuch as the Legislature failed (unintentionally) to make an appropriation for the purpose, and the Controller is forbidden to audit except there be a specific, unexhausted appropriation.

The Wagon Road Act is but one of several very important Acts passed by the last Legislature, which render it necessary to employ competent engineers and draughtsmen to assist me, and as not one dollar has been placed at my disposal for this purpose, I am delayed in the performance of my duties by the necessity of finding assistants who are able and willing to pay their own expenses and trust the State for the same, as well as for compensation, until a Legislature, some nine months hence, may, if so disposed, make the requisite appropriation. But these even are not all the obstacles in my way. These might be overcome, but there is another more difficult to surmount. I am limited in using the credit of the State to five thousand dollars, a sum that every one knows, who knows anything about the matter, is entirely insufficient for the proper location of the road. Yet, it must be properly located, if at all; at least, this is the opinion of the Commissioners, and I believe, of all. Can this be done? I believe it can, and in this way:

The friends of the various routes can organize parties, supplied with provisions and other necessaries, sufficient for the purpose of making reconnaissance.

I will accompany the parties, or appoint an engineer to do so, in whom I have perfect confidence, and who will trust the State for compensation.

Should your favorite route be selected as one, or the only one to be surveyed, than its proportion, or the whole, as the case may be, of the \$5,000, or so much thereof as may be necessary, can be used in the survey of your route.

I have received ample authority from the Commissioners to make the necessary surveys, and if they are not made, the responsibility rests on me alone.

In Georgetown, Diamond Springs and Mud Springs, money has already been raised, and I have reason to believe that in Sonora, funds are now being raised to enable me to accomplish one important object of the Act. What will the citizens of Camptonville do? They have now a splendid opportunity to back the high opinion they entertain of their route.

I start soon, perhaps to-morrow, for Carson Valley, over one route; and on my return, hope to hear that you have performed your part in this matter, and are anxious to have me perform mine.

Please write soon, and inform me what you have done or can do, that I may make my arrangements accordingly.

I really have not time to copy the letter you speak of, so I send the original, that you may take a copy. Please return the original to me.

In great haste,

I am, very respectfully, your obd't serv't,

S. H. MARLETTE
Surveyor-General.”

This correspondence was published in July, and drew out the concession from a portion of the local press, that the route through El Dorado possessed “a great many things, physical, moral and social, in it s favor;” that the people of Yuba and Sierra evinced no interest in their particular route, and that they remained “as immovable as a corner stone of a church.”

This was very discouraging, yet I had great hopes that Camptonville, at least, would render itself “most happy” by furnishing the desired assistance, according to the assurances of Judge Smith’s letter, but no reply to my communication has ever been received; nor has Colonel Jones’ letter, setting forth the advantages of the Downieville or Henness, route, been returned, both of which I greatly regretted, as I was desirous of obtaining reliable information in regard to all the practicable passes in the Sierra Nevada, not only to enable the Commissioners to select the most practicable and economical route, but also to serve as a basis for appropriations for the construction of such other roads as future Legislatures might deem necessary.

On the 16th of July the following, in regard to this matter, was published:

“The great difficulty has been, and is, in raising funds for the purchase of the requisite instruments, and the pay of the necessary assistants, as the law does not make any appropriation for the purpose, and the Controller cannot, and will not, audit the bills incurred on these accounts. But it is expected that the inhabitants adjacent to the various routes will furnish the money necessary to make the surveys on them, and that within a reasonable time the estimates, maps and profiles will be laid before the Board of Road Commissioners, and the route be determined by them, and the construction of the road commenced.”

Mr. Day, after having completed a reconnaissance of the Georgetown route as far as Lake Bigler, had made a survey of the State Prison grounds, and returned to Sacramento; and on the 16th day of July we started for Diamond Springs *en route* for Carson Valley *via* a route that had been recommended during the last session by O. M. Taylor, Esq., of Cold Spring Ranch, and had recently been partially examined by Dr. Bradley.

I was to have gone over the Diamond Spring Route, but has no guide made his appearance the next morning, I accompanied Mr. Day *via* Placerville. On the 25th we returned to the latter place, where I left Mr. Day on the 26th, endeavoring to organize a party to accompany him over such portions of the routes as we had found it impracticable to examine, or to make such surveys in that vicinity as the public spirit and liberality of the citizens might justify, whilst I hastened to Sacramento, expecting to find assurances from all parts of the State, particularly from Sonora and Camptonville, of the intense anxiety of the people to contribute of their abundance towards the expense of the Wagon Road explorations. I found one, with the exception of one from David Shepherd, Esq., of Murphy’s Camp, Calaveras, of which I shall speak presently.

Finding the people in Placerville not very anxious to furnish the requisite means to carry on operations energetically, I wrote to Mr. Day, advising him, (unless they were ready to co-operate with us by raising the necessary party, provisions, funds, etc., to enable him to continue his explorations, or make a survey, as he and they might deem

best,) to leave them until they should become satisfied, not only of the propriety, but of the necessity of doing the same; and stating that I could “find other portions of the State where his labors would be appreciated.”

After one week’s delay he was enabled to start with a party and outfit, to raise which, one day should have been sufficient.

On the 28th of July I wrote to Mr. Shepherd, as follows:

“Dear Sir:

On my return to this place on the 26th inst., from a trip to Carson Valley, whither I have been in search of the best route for the Immigrant Wagon Road over the Sierra Nevada, I was quite pleased to find your favor of the 12th inst., requesting me not to overlook the claims of Calaveras County, and informing me of the readiness of a part, at least, of her citizens to co-operate with me in accomplishing the object of the Wagon Road Act.

I have heretofore, both in conversation and letters, stated to several of her citizens the fact, that the last Legislature failed to place any funds at my disposal for the survey of this road, and that it would be necessary for the friends of the several routes to furnish necessary means to make the requisite explorations and surveys; yet, until now, I have received but little encouragement from Calaveras; but, as it is better late than never, your assurances of co-operation are very acceptable.

I would suggest, as the most practicable way to accomplish your desired object, that you organize a sufficient party, under the charge of a competent person, to hunt up the best route to be found between your proposed termini, also to cut the brush and find crossings, sufficiently to enable me or my deputy to examine the same without unnecessary delay, and give information when this shall have been done; after which, I or my deputy will examine the route, and determine whether an accurate survey may be necessary.

Please write immediately, and inform me of your opinion of my suggestion, and of the action, if any, taken by your fellow-citizens.

Hoping to hear from you soon, and that your action may make a visit to your town necessary on my part,

I am, etc.”

On the 10th of August an answer was received from Mr. Shepherd, dated the 8th, stating that on the reception of my letter, the citizens of Murphy’s immediately went to work, raised about seven hundred dollars, and started a party of six good men to explore the route, with one Mexican and three animals packed with a good outfit, enough for a month’s journey at least; also, that in the party there was one West Point Civil Engineer, a Mr. Hall, who had crossed the Sierra in four different places further north; that in securing his services, they considered themselves quite fortunate; that the party had also one doctor and one surveyor, the rest good mountain men, ready for anything; that he had delayed writing until he saw the party off, etc. He also wrote that he expected the party would be home in about three weeks, when “you will receive a correct report.”

On the 5th of August, George H. Goddard, Civil Engineer, left this city with a party and animals, provided by Judge Orson Hyde, of Utah Territory, under instructions, (a copy of which may be found prefixed to his report in Appendix A, No. 3, to which I beg leave to refer,) to proceed to Placerville *en route* for Carson Valley by the Old Carson Route, and to take such barometrical observations as would enable him to construct a profile of the same; to take also, a somewhat accurate sketch of the country traversed, and to collect such other data as in his opinion would be of service in comparing the merits of that with other routes for the Immigrant Wagon Road, in respect to both practicability and economy of construction.

In fulfillment of the conditions on which Judge Hyde had agreed to furnish men, animals, provisions, etc., Mr. Goddard was instructed to determine at, or near, Carson Valley, the position of eastern boundary of the State; and it was suggested that the portion of the same lying in Carson Valley, or so much of it as might be deemed necessary, should be measured and defined with tolerable accuracy, to be used as a primary base in determining trigonometrically the positions of such points as might be found advisable to determine for the purpose of connecting our surveys and explorations, and for fixing the eastern terminus of the road.

From the primary and secondary bases, observations were to be taken to determine the positions of the well defined peaks and other prominent objects of the Sierra Nevada, and other portions of the surrounding country.

He was to return by such route as would most facilitate the selection of the most practicable and economical route for the Immigrant Wagon Road, and was, as far as practicable, to take the same observations, for profile, map, etc., coming as going.

It may not be improper to give some of my reasons for authorizing the establishing of the eastern boundary.

I had during the previous year received a petition to locate the same, signed by about one hundred and fifty of the citizens of El Dorado County, among whom are the Hons. Alfred Briggs, B. F. Keene, J. W. Johnson and Messrs. D. K. Newell, S. F. Child, W. M. Cary, etc.

Again; it was considered of importance, if practicable, to have the road located wholly within this State; and the authority of the Commissioners to contract for the construction of any portion of the road beyond the State line, was at least questionable.

It was also believed, that by making the boundary survey auxiliary to the Wagon Road explorations and surveys, the former could be effected without any additional expense to the State; and I am of the opinion that this has been nearly, if not quite, accomplished, notwithstanding the many disadvantages under which Mr. Goddard labored.

I take great pleasure in calling attention to the important results of Mr. Goddard's expedition, as set forth in his valuable report, [in Appendix A, No. 3,] and illustrated by the profiles and well executed map accompanying it.

In one of the towns through which he passed, he was refused a week's provisions for his party on the credit of the State. One public spirited individual had agreed to furnish the same, but was induced not to do so by false statements to the effect that there was no appropriation in the Act, and funds were subject to the order of the Surveyor-General, to defray surveying expenses, etc., and the animals were kept in durance vile by the stable-keeper, until arrangements were made for settling the stable

bill. On hearing of the above I visited the town, informed a portion of it's citizens that I had nothing with which to settle the bills, but that unless the provisions were forthcoming, and the animals too, I would move not further in the road matter, in their vicinity. The conditions were complied with.

On the 17th of August, finding it impossible to comply with the requirements of the Wagon Road Act, in a mode commensurate with the importance of the same, in the vain hope of obtaining assistance from some ardent friend of the road, the following advertisement was inserted in the Sacramento papers:

“Wanted, immediately, on the credit of the State, \$500, to enable the undersigned to complete the explorations for the Immigrant Wagon Road. Any gentleman who is willing to advance the above named sum, and will signify the same, will be called upon immediately by the undersigned.

S. H. MARLETTE,
Surveyor-General.”

Two gentlemen called to inquire what security could be given for the above named amount, to which it was replied: “The justice and liberality of the next Legislature.”

It was my intention, had I succeeded in raising the necessary funds, to have gone myself, (so far as other official duties would permit), and to have sent competent engineers into various parts of the State, to urge upon the people the necessity of providing means to explore their favorite routs; but having waited nearly two weeks in vain, as a last resort, I published (until the 15th of September) a notice, of which the following is the substance, together with the accompanying letter of the Controller:

“THE IMMIGRANT WAGON ROAD.

SURVEYOR-GENERAL'S OFFICE,
Sacramento, Aug. 29, 1855.

To the Friends of the Immigrant Wagon Road:

The parties now engaged in exploring routes for the Wagon Road will have returned and reported by the 15th of next month, and immediately thereafter I shall report to the Commissioners, upon whom it will then devolve to select the route upon which the road shall be located. The road will then be surveyed, estimates made, specifications drawn up, and the work advertised and let by contract to the lowest responsible bidder, and the road constructed so soon as practicable thereafter.

I expect to be able to report upon seven or eight different routes. Many more ought to be examined; and I would respectfully urge upon the friends of the various routes that have been neglected, the necessity of sending out parties under competent engineers, to make explorations and report the result as soon as practicable to me.

Should it be absolutely necessary that a few days further time should be granted, and representations to this effect be received, they would receive due consideration, but such necessity is not anticipated.

It may be well to state that the undersigned has not been able to obtain one dollar from the State under the Wagon Road Act, of which any one may be satisfied by reading the accompanying letter from the Controller.

I deem it but justice to the Commissioners and myself to state also, that for nearly two months I have not been able to get one dollar from the State for any purpose whatever, except to pay office rent, and there is not possibility of obtaining hereafter one dollar for the use of this office, except for rent, until another Legislature shall have made an appropriation, for the very simple reason that the last Legislature failed to make appropriations for this office.

Times almost without number, have these statements been made, yet the same fault is found with the Commissioners in general, and the undersigned in particular, as could reasonably be found, if they had an overflowing treasury at their service.

S. H. MARLETTE,
Surveyor-General.”

“STATE CONTROLLER’S OFFICE,
Sacramento, June 30, 1855.

Hon. S. H. MARLETTE, Surveyor-General:

Sir:

In reply to your letter, asking ‘whether any accounts will be audited under an Act to provide for the survey and construction of a Wagon Road over the Sierra Nevada Mountains?’ I have the honor to inform you that I cannot audit any accounts under its provisions, as there is not appropriation of money contained in the Act.

Very Respectfully,
Your obed’t serv’t,

SAM. BELL
Controller of State.”

On the 8th of September I received the following:

“FIDDLETOWN, September 7th, 1855.

S. H. MARLETTE, Surveyor-General:

Sir:

Having for a long time expected that some action would be made from your office, in relation to the survey of a Wagon Road across the Sierra Nevada Mountains to Carson Valley, by the way of this place, from the conversation that I had with you in the Spring, at your office, in the presence of Mr. A. R. Jackson, *i.e.*, that when you started out, you would either start from here and return by the way of Placerville, or, *vice versa*; and having been out by the latter route, and not by this, owing to the want of funds being provided, as appears by your card of August 29th, which to us is, so far as you are concerned, entirely satisfactory, this is to request you to come, if you possibly can, early in next week, and make a preliminary survey of the route, by this place, to intersect the survey made from Placerville, near Leek Springs; or to find if the gap in the mountains at the source of the Mokelumne River, is not more practicable than the one now used on the Placerville Route.

If you will come with the necessary instruments to make the requisite observations, the company will be made up at this place to perform all the other duties connected with it, and the expenses will be defrayed by the citizens.

We wish you to make a personal inspection of this route, as we are confident that the one to Placerville will bear no comparison with this, in point of easy grade, shortness, or other facilities, for constructing such road, on such principles as contemplated by the law.

If, however, it should be out of your power to come at so early a period, or at all, we wish you to defer, (if it should not be in your power to make the survey, and report by the 15th of this month,) your report to the Commissioners, until we may have time to make ours to you, which will not be later than the 20th of this month.

This, if you are at Sacramento City, will be presented to you by J. H. Young, Esq., of this place, who will learn from you what may be expected by us.

Very Respectfully Yours,

JONA. PALMER

On Behalf of the Citizens."

To this it was replied, that I would defer my report until the 20th, as desired; also, that no further explorations were necessary on any route crossing the great western spur or summit of the Sierra Nevada; nor, as the road was represented were necessary, under the Act, as it contemplated no expenditure where the road was then traveled with ordinary ease, and recommended only such explorations as were calculated to avoid the above mentioned spur, as Mr. Goddard would obtain all the information necessary in relation to the route over the same.

On the 12th information was received from Mr. Palmer, that the citizens thought best to let the matter rest, if no location of a road west of the dividing ridge was to be made, as probably the old pass was as good as the one to the south of it would be.

About two weeks had elapsed since the return of the Calaveras exploring party, when, on the 11th of September, I received a communication from David Shepherd, dated the 10th, stating that the party had returned after a three weeks' absence, and had

made a report, from which it appeared that they had made a very thorough examination, and that the route from Murphy's must pass through Carson Cañon.

Mr. S. spoke very favorable of the route, and said, "inclosed, I will send you, if I receive in time, the printed report of the expedition, with a map of the route and all distances."

In a postscript, he says: "I have just received the *Calaveras Chronicle*, and by some means the report of the Exploring Expedition has been omitted. I suppose it will be published this week, and in time for you to see it."

The report was published on the 15th, and on the 20th a copy was obtained.

The report was not signed by Mr. Hall, the West Point Civil Engineer, or by a Surveyor, nor was any reason given for the omission. It was not addressed to the Surveyor-General, and no trouble had been taken to forward a copy to him.

Two reports, fuller than the one above mentioned, upon the Calaveras Route, have since been received, which may be found in the Appendices A. and F., for which reason the former one is not transmitted.

On the 20th I laid the above mentioned report, together with that of Mr. Day, before the Board of Commissioners, who adopted the route of the South Fork of the American River, Slippery Ford, Johnson's Pass, Luther's Pass, Hope Valley and Carson Cañon; and, notwithstanding the difficulties encountered in making, or attempting to make, the explorations, I am of the opinion that no better, taking everything into consideration, will be found.

2. THE SURVEY OF THE ROAD

On the 26th of September the route was selected. On the 27th, the Hon. Sherman Day went to Placerville for the purpose of organizing a party and beginning the survey as soon as the necessary means should be provided; and on the 30th, I went to the same place with a view to hasten, if possible, the furnishing of the means.

It was stated to parties interested that it was the determination of the Commissioners, if possible, to have the road constructed before the expiration of their term of office.

It was stated, also, that in order that the road might be located and estimated speedily so that the above object could be accomplished, it would be necessary to have funds to defray the expenses of the survey, and that it could not be commenced until \$3,000 in cash were placed at the disposal of Mr. Day and myself, \$500 of which must be under my exclusive control, to enable me properly to co-operate with Mr. Day in carrying forward this important project, and that I would not attempt it at that late day unless the funds were at once provided, as I had already exhausted my own means in furthering this and other matters connected with my office.

I remained until my presence was required at Sacramento, when I returned on the 3rd of October, leaving the following instructions with Mr. Day:

“Placerville, Oct. 2, 1855.

Hon. SHERMAN DAY,
Engineer Immigrant Road, etc.

Dear Sir:

So soon as three thousand dollars shall have been placed at your disposal (five hundred of which you will immediately forward to me), you will organize a party and proceed to locate the Immigrant Wagon Road, locating the eastern portion first.

On being informed that the necessary funds are raised, I will forward such other instructions as may be deemed necessary.

I am, very respectfully,
Your obedient servant,

S. H. MARLETTE,
Surveyor-General.”

While at Placerville, I found it necessary to borrow money to pay certain of Mr. Day's assistants, employed near that town during the explorations which, together with sums expended before and since in carrying forward this survey, have not been refunded to me, and form a part of the deficiency to be provided for.

Fearing that so much time would be lost before the commencement of the survey, that in case of an early and severe winter we might not be able to complete the

location of the portion of the road on and east of the Sierra before the falling of snow, I sent the following note to Mr. Day:

“SURVEYOR-GENERAL’S OFFICE,
Sacramento, Oct. 5, 1855.

Hon. SHERMAN DAY:

Dear Sir:

I hope you will not allow the people of Placerville to trifle with us any longer, but leave on the stage on Monday morning for this place, unless they shall have, prior to that time, enabled you to comply with my request to send me the five hundred dollars; and unless they shall have also, prior to that time, either placed the full amount necessary for the survey at your disposal, or satisfied you that it shall be done on Monday or so soon as you may think necessary.

In no case will you proceed further than you have means furnished you.

On your return, I shall move a reconsideration of our decision and a reference of the whole matter to the Legislature.

You can state this to the people of Placerville, and you may rely on being sustained, for I am heartily disgusted with their trifling.

I am, very respectfully,
Your obedient servant,

S. H. MARLETTE,
Surveyor-General.”

Up to the evening of the 6th, but \$400 hundred dollars had been raised.

The Board of Supervisors of El Dorado County had also appropriated \$1,000, but as the Treasurer was in San Francisco none of this could be had, nor was it known that he would recognize the act as legal.

It was expected that in the course of ten days the Common Council of Placerville would appropriate \$2,000 of scrip. So, on being assured that the above was the utmost that could then be done, I consented that Mr. Day should commence the survey.

Mr. Day left on the evening of the 8th with such a party and outfit as \$400 cash and \$3,000 of *promises* enabled him to obtain. Thus, nearly two weeks were lost.

On the 15th, I received a communication dated the 13th from a prominent citizen of Placerville, from which I take the following: “Our people, feeling a deep interest in the contemplated Wagon Road, and anxious to commit the State to the completion of it beyond the contingency of the next Legislature, are very solicitous that you should, without further delay, advertise for proposals to construct the road.

If prompt action now directs the Commissioners, I am certain this great enterprise will be forwarded beyond our present anticipations. Much can be done between now and the meeting of the Legislature to open this “Winter Pass.””

In the vain hope of allaying the suspicions of the people, and of satisfying them that we were in earnest in the Wagon Road matter and thereby securing a more hearty co-operation, the desired advertisement was drawn up and published on the 17th, and on the same day I replied to the foregoing that I felt a "lively interest in the contemplated \$500," and that I must have the same, giving reasons therefore, and requesting an immediate answer. One month afterward I received what I suppose was intended for an answer, of which I shall speak hereafter.

On the 23rd I received a letter from Mr. Day, dated the 18th, in which he said: "I fear we shall not be able to get so easy a grade as we had formerly expected. I fear we shall be so hemmed in by rocks that we cannot do better [in some localities] than six or seven degrees, without going to an expense which the law does not seem to contemplate."

The above was very unwelcome information, seven degrees being about double the grade we had anticipated, and I began to fear that a proper regard for the interest of the State might require that the letting of the contract for the construction of the road should be postponed until other routes should be more thoroughly examined.

About this time, having been informed that the citizens of Calaveras were to hold an Immigrant Wagon Road Convention on the first of November, I concluded I would attend it for the purpose of informing myself of, and perhaps taking part in, the proceedings.

No convention ever assembled, no notice of the same having been published, so I returned, after having made such suggestions as were calculated, if acted upon, to secure to the Calaveras route proper consideration.

Returning on the 9th of November, I found three communications from Mr. Day, giving a history of the progress of the survey, and placing the subject of grades in a much better light, as he had avoided thus far, all above five degrees; also calling for additional assistance, which it was not in my power to render.

He stated that he had intended to send me a map, a general profile and some minor profiles and plans on an enlarged scale, with details and specifications of drains, culverts, etc., but that on thinking the matter over, he found it would be utterly impossible to attempt it even without a draftsman to remain in the camp all the time; that if he remained in camp and his assistant with him to work up the drawings and calculations, there would be six or seven men idle and eating up provisions and wages, and the fine, clear weather would be passing away.

The amount of work remaining to be done at that time, and the many disadvantages under which it was to be performed, led me to believe it would be unadvisable to continue publishing the advertisement for the reception of proposals for the construction of the road, and at no subsequent time have I considered such publication expedient.

On the 12th of November I wrote to Mr. Day that I had been desirous of helping him along, and not coming to consult with him, on learning that the grades were not so easy as we had anticipated; that I had been of the opinion that at least one other party should be in the field, and each party provided with a draftsman, to keep up the office work, but that it was with diffidence that I ventured to make any suggestions on the matter, as it was virtually beyond my control, as I had received no answer to my communication, and did not know what provisions had been made for defraying the

expenses of the survey. I advised him, however, not to lose one moment from his field-work, for I began to fear that he would be prevented from completing the location of the road, which would be a sad termination of our labors.

I stated, also, that the plans and specifications could be made out here; that I saw no prospect of letting the work, so as to accomplish anything towards its construction of consequence, if at all, during the term of office; that we could let it, however, when we were ready, (if deemed advisable,) but I did not think we had better do so before; that I thought we would be ready when the road should be wholly located and estimated, plans and specifications made out, and after this, twenty days' notice given; and that I doubted the propriety of letting at an earlier day; that however this might be, I believed in giving contractors a reasonable time to prepare their proposals.

On the same day I received a communication from the Hon. P. C. Rust, of Yuba County, addressed to the Governor and myself, stating that a survey of the "Hennes," or "Downieville Route," just completed by D. B. Scott, Esq¹., a gentleman eminent as a skillful engineer, had furnished convincing proof that said route was the most available one that could be selected by the Board of Commissioners, and asking the Board to waive the letting of the contract for a reasonable length of time, say thirty days, to enable their engineer to make out an elaborate report, and a map worthy to accompany the same. It was intimated that the engineer would not proceed unless the extension time was granted. The communication was accompanied by an epitome of the prospective report, in which Mr. Scott stated that he found it to be unnecessary to adopt any grades exceeding five degrees, between Camptonville and the Big Meadows, and that he thought \$50,000 would construct the road between those points.

The epitome constitutes No. 5 of Appendix A. These were immediately laid before the Board, and on the same day I wrote to Mr. R., suggesting that Mr. Scott's estimate be made for a road sixteen feet in width, the same as was contemplated on the selected route, and urging him, if possible, to have the map, report, etc., ready in twenty days. In reply, Mr. Rust informed me he thought that twenty days would suffice.

On the 14th I wrote to him that I was of the opinion we should not be ready to let the work in twenty, or perhaps thirty days, and that after the reception of the map, estimate, etc., I should be ready to take such action as the best interests of the State might demand, and again urged him to press the map, etc., forward to a speedy completion, and stated that he might rely on having impartial justice.

At the next meeting of the Board, the time for the reception of proposals was extended twenty days, in order that the location of the road might be completed, and plans and specifications prepared.

On the 19th of November I wrote to David Shepherd, Esq., of Murphy's Calaveras County, expressing the opinion that we should not be able to let the road during our term, and recommending that a good engineer be employed to make out as definite and accurate a report of the grades, and estimate of the cost of construction of a road sixteen feet wide, as might be found practicable, which I requested might be addressed and forwarded to me before the 15th of December. Nothing of the kind having been furnished, I have transmitted such reports as have been obtained in other ways. They constitute portions of Appendix A. and F.

¹ Mr. Scott's Report and Map have not been received.

On the 14th of November I received a communication (dated the 13th,) from Placerville, in which the writer stated that he had understood I had expended \$500 on the Immigrant Road, which he would retain in his hands, and refund to me so soon as Mr. Day should sanction it; that of course Mr. Day, as my deputy, should be consulted in regard to expenditures. That they were appointed by the Board of Supervisors as viewers, and were jointly responsible for \$1,000 placed in their hands by the Board, and for \$2,000 of Placerville City Scrip, for defraying the expense of the survey; that a part of the same, about \$900, had been expended; that after Mr. Day's departure he (not Mr. Day,) had drawn the \$1,000 which was still on hand, and that on the return of Mr. Day my matter would be adjusted. I considered the foregoing as uncalled for, as I had presented no bill to be audited by said Viewers.

On the 19th, a communication from Placerville, dated the 18th, arrived in which it was stated, that after a long time things had got into some tangible form in regard to money matters; that I could draw on Mr. ----- for the \$500, which would be paid at any time; that the Supervisors had agreed to make an appropriation when the survey should be completed, to pay all expenses; that there would be no further trouble about money matters; also that if I would come up, all my expenses should be paid, etc. On the same day I communicated my reasons for not accepting the above late, but charitable, invitation, as follows:

“Dear Sir:

Your favor of yesterday's date I received this afternoon. I regret that the means necessary to enable me to properly co-operate with Mr. Day in the location of the Wagon Road, were not furnished me as I desired. What excuse or reason your people have for the unwise course they have pursued, I am of course entirely ignorant of, as they have not deigned to make any reply to my requests, since the departure of Mr. Day. By neglecting to furnish me with the necessary funds, they have prevented me from going over the work, and consulting with Mr. Day, and from providing him with such additional assistance as was necessary to prepare the work for an early letting, and thus, if possible, secure its completion before my term shall expire, which you and many others, who should have done everything in your power to assist me, knew was my wish and determination.

How *have* you aided me? In the first place, it was nearly a month before you raised one dollar for the location. When I visited your place, with the vain hope that I might hasten the raising of the necessary funds, what encouragement did I receive? Why, this – I was compelled to borrow money to pay men for assisting Mr. Day in making surveys in the vicinity of Placerville. To pay that money, I came home, drew my salary, and paid it out of that! Has Placerville or El Dorado ever refunded that money? No! Did I not state to you and many others in Placerville that I had not for months received one dollar from the State for any purpose whatever, connected with my office, except for rent and salary? And did you not know that the salary is not sufficient to defray my personal expenses? Did I not tell you I *must have* \$500 immediately, to enable me to relieve myself from the debts I had incurred (for the Wagon Road), and were then due, or nearly so? Did I not state in almost every communication to Mr. Day, that I must have \$500? Did I not again state in a letter to -----, dated about the

middle of last month, that I desired to start the next Tuesday to go over the road in company with the Governor, and several gentlemen who desired to bid for work? Did I not state that I *must have* the \$500 before I went, to place matters in such a condition that I could leave, and to pay the expenses of the trip? Yes, all these things are true! Were these matters considered of sufficient importance to entitle them to an answer? No!

On the 14th of this month I received a letter from Mr. -----, stating that he is informed that I have expended \$500 on this Wagon Road, and that he will hold the same in his hands until Mr. Day's return, when if Mr. Day approves it, he (Mr. -----,) will refund that amount. Mr. ----- says: 'Of course Mr. Day, as your deputy, should be consulted in the matter.' I considered the letter an insult, and did not reply to it. I presume yours is not intended as such, and have therefore replied to it.

Mr. ----- closes his letter by saying that when Mr. Day returns (if he approves it,) my 'matter will be arranged.' My 'matter' was, that I wanted \$500 many weeks ago, to enable me to aid Mr. Day, and to consult with him in locating the Wagon Road, and preparing it for letting. The time I might have devoted to these objects is past, my whole time being now taken up in performing other official duties."

Shortly after the above was written, I received a call from Mr. Kirk, of Placerville, to whom I suggested that some of the friends of the road had better see Mr. Day, and consult with him on the propriety of obtaining additional assistance, in the form of another party, to run a preliminary line ahead of the locating party, and a draftsman to bring up the office work. The latter suggestion was acted upon.

On the 12th of December, in consequence of learning that Mr. Day had been informed that the Commissioners were expecting to have the estimates, plans and specifications, prior to the second Wednesday in December, I wrote to him that I did not expect any such impossibility; that I considered the immediate completion of the location of the road as the first object; that the estimates, plans and specifications, were next to be attended to, and afterward the letting of the contracts.

On the same day he transmitted from Slippery Ford, a report of the progress of the survey, and an estimate of the cost of constructing the road from the eastern terminus to that point. One copy I received on the 15th, another had previously been received by the other Commissioners, a fact worth mentioning, inasmuch as there has been an impression that I have retained the specifications and estimates from the other Commissioners. Both copies were transmitted by the same special messenger, by Mr. Day, to Placerville.

On the 31st of December, at the hour which a meeting of the Board had been called, I placed the following protest in the hands of Hon. Charles H. Hempstead, Secretary of State, since which time I have not attended any meetings of the Board.

3. "PROTEST.

SURVEYOR-GENERAL'S OFFICE,
Sacramento, Dec. 31, 1855.

To his Excellency, JOHN BIGLER, Governor, and Hon. CHAS. H. HEMPSTEAD, Sec.
of State of the State of California, and Immigrant Wagon Road Commissioners:

Gentlemen:

In compliance with your request, and in accordance with my views of propriety, I have the honor herewith to transmit the accompanying packet, marked 'Proposal,' which has been lying in this office for several days, and which I presume to be a proposal for the construction of the Immigrant Wagon Road. I transmit the same in view of the fact that it appears to be the determination to award the contract, notwithstanding the objections urged by the undersigned.

In transmitting the accompanying 'proposal,' I do not wish to be considered as at all acknowledging that either this or any other proposal is now, or can be properly (under existing circumstances) before the Board, but would most emphatically deny the same; and would further assert that the work cannot be now let, except in violation of the intentions of the Legislature, and with an utter disregard of the usual manner of letting such works, and without great risk of committing the State to a contract so loosely drawn as to admit of various constructions.

The Wagon Road is *not yet surveyed*, plans and specifications are not yet ready, and until the survey shall have been completed, plans and specifications prepared and ready for exhibition, and notice to this effect published for twenty days, the work cannot be let without giving reasonable cause for complaint. Nor should the twenty days' notice transpire while the ground is so covered with snow as to render it almost impracticable for those desirous of bidding for the work to even go over the route, to say nothing of the impossibility of judging of the character of the work, or of the expense of its construction.

Further, the contract cannot be now let, except by a departure on the part of the Commissioners from the mode of procedure which the published notices would reasonably lead the public to expect. This remark is true not only concerning those that have been published without his knowledge or consent.

My object in presenting in writing, the substance of the verbal objections made on Saturday last, to the action of the majority of the Board, is to prevent any misunderstanding hereafter as to what amount of responsibility attaches to myself in the proposed letting of contracts for the construction of the Wagon Road.

Regretting the necessity for this communication,

I have the honor to be, very respectfully,
Your obed't serv't,

S. H. MARLETTE,
Surveyor-General.

P. S. I beg leave to present the following resolution, as embodying my views as to such action proper to be taken by the Board at this time. It was presented on the 28th inst. at the 'informal' meeting, but failed to pass:

Resolved, that the time for the reception of proposals for the construction of the Immigrant Wagon Road over the Sierra Nevada, be continued until the location of the same; also plans, specifications and estimates shall have been completed, and *twenty days* thereafter.

N. B. The Commissioners reserve to themselves the right to reject, if deemed proper, all proposals.

S. H. M.”

NOTE – In Appendix A No. 2, may be found Mr. Day's Report upon the survey of the road, up to January 7th, 1856. His letter of resignation was received on that day, and the substance of it immediately reported to my successor.

4. OTHER ROADS RECOMMENDED.

It is respectfully recommended that it be made the duty of the Surveyor-General to make such further explorations and surveys of routes for Wagon Roads over the Sierra Nevada as may be deemed necessary by the Board of Wagon Road Commissioners; and to make maps and profiles of said routes, with plans, specifications and estimates of the cost of construction of good Wagon Roads upon the most practicable, to be presented to said Board. To defray the expenses to be thus incurred, I would recommend an appropriation of \$15,000.

I would also recommend an appropriation of \$150,000, to defray the expense of constructing roads upon such of said routes as may be selected by the Board, the same to be apportioned as the Commissioners may deem most judicious.

The roads might be surveyed and estimated, and the apportionment made public prior to the submitting of the \$150,000 appropriation to the people, should such submission be considered necessary.

III. STATE LANDS.

1. SCHOOL LANDS.

The Commissioner of the General Land Office, in his Report of November 30, 1853, estimates the area of the State, exclusive of water surface, at 188,981 square miles, or 120,947,840 acres;

Of which one-eighteenth (the 16 th and 36 th sections) has been donated to this State for the support of Schools, equal to acres...	6,719,324
For a University, two Townships or, acres.....	46,080
For Internal Improvements (devoted to the cause of Education by the Constitution of this State).....	<u>500,000</u>
Constituting an aggregate of, acres.....	7,265,404

From which, if judiciously selected and disposed of, may be derived a magnificent fund for the education of the children of California.

From the above amount deduct 232,000 acres, for which School Land Warrants have been sold, and there remain of lands for educational purposes, 7,033,404 acres, to which add 6,400 acres (ten sections) donated for the erection of public buildings; also the swamp and overflowed lands, and lands subject to overflow at certain seasons of the year to which she is entitled, estimated in my former Report at 5,000,000 acres, and we shall have a total of 12,039,804 acres, or nearly one-tenth of the whole land area as belonging to the State.

The following remarks taken from my former Report are considered applicable now, to some extent:

“Whenever the 16th and 36th sections shall have been taken up, provisions to their survey by the General Government, and when they shall fall upon mineral lands, the State must look elsewhere for an equivalent.

Upon the best lands in the State the settlers are far in advance of the Surveyors, and are likely to continue so for some time to come; and it is clearly apparent that unless judicious measures shall be adopted by the ensuing Legislature for the selection of these lands, so far as it can be done under existing laws of the United States, and unless Congress shall be effectually requested to modify the laws in relation to the subject, California will be a great sufferer, and the *apparently* munificent donation of the General Government will prove to be in reality comparatively worthless.”

The last Legislature passed “An Act to provide for the selection of lands donated by the United States to the State of California for the support of common schools and for the erection of public buildings,” which authorized and required the Surveyor-General to select such portion of the 500,000 acres as remained unselected; also to select the quantity of ten entire sections, granted by Act of Congress for the erection of public buildings; also lands in lieu of the 16th and 36th sections that might be settled upon prior to survey, or owned by virtue of a valid Spanish grant; also for the selection of certain school lands for fractional townships.

He was required, also, to obtain from the U. S. Surveyor-General certified copies of the United States township plats, to be used as a guide in the selection of said lands.

To enable him to comply with the requirements of this important Act, not one dollar was appropriated. An attempt toward an appropriation to defray a portion of the expenses to be incurred under the Act, was made, and read as follows: "All necessary expenses incurred in procuring copies of said surveys from the United States Surveyor-General, for the purposes mentioned in this Act, shall be audited and paid by the Controller out of the General Fund."

The Act requires the Surveyor-General to make to the Governor a monthly report of the selections made, accompanied by plats of the lands; the report to state the quantity, quality, locality and estimated value of the lands. It also requires him to embrace, in his Annual Report, a full statement of the quantity, quality, locality and estimated value of the lands selected, together with the plats of the same.

It became necessary for him to make copies of all the United States township plats, obtained from the United States Surveyor-General, to be transmitted to the County Surveyor, whose duty it was made, when called upon, to assist the Surveyor-General in selecting said lands; yet for the performance of all these things no funds were provided.

Four hundred township plats have been obtained from the U. S. Surveyor-General's Office. Three hundred of these have been copied on tracing paper, and the tracings submitted to the County Surveyors of the counties in which they respectively belong, as follows:

		No. of Plats.	
To the County Surveyor of	Colusi		12
"	"	Humboldt.....	3
"	"	Merced.....	96
"	"	San Bernardino.....	4
"	"	San Francisco.....	2
"	"	San Joaquin.....	5
"	"	Shasta.....	5
"	"	Solano.....	4
"	"	Sonoma (in Mendocino).....	6
"	"	Stanislaus.....	18
"	"	Tulare.....	131
"	"	Yolo.....	5
Total.....			² 303

Some not having arrived at their destination, duplicates have been forwarded.

All of the above have been acknowledged as received, except those (three,) sent to Humboldt County.

² Three of the above were sent to both San Joaquin and Stanislaus, they belonging partly in both counties.

The position of these townships may be seen at once by a glance at the accompanying map, in which may be found (colored,) the three hundred townships, of which plats have been received, and tracings sent. Also one hundred townships, (crossed,) of which the plats have been received, but not copied. The tracings sent to the County Surveyors were accompanied by a copy of the Act for the selection of lands, and by instructions, to carefully preserve and use them, in making the selection in accordance with the Act, and with such instructions as had been, or might be forwarded to them. They were informed that of the 500,000 acres granted by Act of Congress of Sept. 4, 1841, there remained to be selected 268,000 acres, and were required to report what portion of this, and of the "ten entire sections," for the erection of public buildings, could be judiciously selected in their respective counties.

They were also required to report what, if any, of the 16th and 36th sections were settled upon, and in most instances were ordered to proceed without delay, to select others in their stead. They were also required to send to this office immediately all the information they could furnish as to the quantity, quality, locality, value, etc., of such lands as were then subject to selection by the State; also all suggestions that would be of service in issuing instructions for guidance in complying with the Act. Except from the Surveyors of Merced and Stanislaus Counties, no returns have been received in compliance with the above requirements. The Surveyor of Merced says, that of the 268,000 acres, "perhaps forty or fifty thousand might be selected to advantage," in his county; and the "whole of ten entire sections, unless extraordinarily valuable lands, are desired;" also that some of the 16th and 36th sections are settled upon, in some cases the whole, in others a part of being taken up.

The Surveyor of Stanislaus says: "There can be selected in this county thirty thousand acres of land, of good quality for farming or grazing." Cannot give present value; "in a few years will be the most desirable in the county."

The Circular of the Commissioner of the General Land Office, requires the selections of the 500,000 acres to "be based upon the official township plats of the public surveys, which are required to be approved by the Surveyor-General, and on file in the local Land Office, at the time of filing selection." Section 5 reads as follows: "The selecting agent of the State should file in your (the U. S. Register's,) office, an authenticated copy of his letter of appointment, or other satisfactory evidence of his authority."

The following communication will show to what extent I had endeavored to comply; also to what extent I had then succeeded in complying with the above requirements of the Commissioner's Circular, so far as the Middle Land District is concerned:

"STATE SURVEYOR-GENERAL'S OFFICE,
Sacramento, Oct. 18, 1855.

Col. W. W. GIFT, Register U. S. Land Office, Benicia:

Dear Sir:

On the 24th of May, and again on the 6th, and still again on the 14th of June last, I had the honor to send to your address, an official communication and respectfully requested an answer to the same, but as of yet have received none. With my first communication I transmitted a certified copy of 'An Act to provide for the selection of lands donated by the United States to the State of California, for the support of Common Schools, and for the erection of Public Buildings,' approved May 7th, 1855, which I expressed a desire to file in your office as evidence of my appointment as the Selecting Agent of the State, as required by Act of Congress.³

I requested certain information, which is very desirable, I order that I may properly comply with the duties assigned me by the Legislature. I stated in my communication of June 6th, that any charges for the same would be paid on presentation at this office. I again transmit a copy of the Act of the last Legislature, for the selection of lands specified, for the purpose of having it *filed* in your office, and would most respectfully request that I may be furnished with *all* the information necessary to enable me to comply with the Act, in accordance with the laws of the United States, or if this cannot be furnished, please inform me at an early day, how, and on what terms it can be obtained, and greatly oblige,

Very respectfully,

Your obedient servant,

S. H. MARLETTE,
State Surveyor-General.

N. B. An examination of the Act will show what kind of information is needed, full as well as I could express it. Please inform me if the Act is *filed*.

S. H. M.”

No reply to the above communication has been received.

Finding it impossible to comply with the Act without the co-operation of the U. S. Register, the following communication was sent to him:

“STATE SURVEYOR-GENERAL’S OFFICE,
Sacramento, Dec. 1, 1855.

W. W. GIFT, Esq.:

Dear Sir:

You are respectfully solicited to furnish this office with a statement of all the settlements made by pre-emptors upon the 16th and 36th Sections within your District, for the purpose of enabling the State to make selections in lieu thereof, according to Act of Congress.

I am also desirous of your official opinion concerning the right of State to elect, either to abandon the whole of a section when deprived by a valid settlement of only a

³ Should have been Circular of Commissioner of General Land Office.

portion, or to take the remainder of such section, and select its complement elsewhere. An early answer will oblige,

Respectfully, your obd't serv't,

S. H. MARLETTE,
Surveyor-General.

PER WM. L. DE WITT."

To this no answer has been received.

From the Hon. Chas. S. Fairfax, Register of the U. S. Land Office at Marysville, and his Clerk, Chas. A. Keeper, Esq., I have received prompt and courteous replies to my communications, with assurances that they will furnish with pleasure, any desired information pertaining to their office.

Somewhat similar assurances have been received from H. P. Dorsey, Esq., Register of the U. S. Land Office at Los Angeles. I regret to state that Mr. Dorsey is of the opinion that it is necessary that the selecting agent of the State should file his authority in person; for this I have not found it practicable to do.

As application has been made to the two above named officers, for such information as is deemed necessary, it may reasonably be anticipated that all obstacles preventing the selection of lands, except those arising from a failure to comply with instructions on the part of the County Surveyor will soon be removed.

The obstacles then remaining, can only be removed by the passage of more stringent laws concerning the office of the County Surveyor.

On the 10th of August it was found necessary to apply to the U. S. Surveyor-General for information in relation to the selection of these lands. In reply, a communication was received from Col. Ransom, Chief Clerk, to the effect that, as the office was not in possession of the desired information, my communication had been forwarded to the Commissioner of the General Land Office at Washington.

Nothing further has been received.

Up to the 9th of October three hundred township plats had been received at this office, and on that day the U. S. Surveyor-General's bill for the same, properly certified, was presented by Col. Ransom to the Controller and rejected on the ground that there was no appropriation by law to meet the same.

It was not anticipated, after this rejection, that any more plats would have been received at this office, until after provision should be made to defray the expense; yet one hundred additional plats have been received.

In this connection I beg leave to remark, that the State Surveyor-General is entirely at the mercy of the U. S. Surveyor-General and the U. S. Registers; that he can do but little without their co-operation, in making a judicious selection of lands for the State.

I would therefore suggest the propriety of making an immediate appropriation to meet present indebtedness; also that the future incumbent of this office should be placed in such a position that he may pay for what he may desire.

It was understood by Col. Ransom, that he was to receive *cash*, or its equivalent, for the plats; I, therefore, recommend, as a matter of justice, that he be paid in cash.

Maps on drawing paper, instead of tracings, were obtained because of their much greater durability, it having been considered highly important to have permanent records of the U. S. Surveys in this office.

This was deemed advisable, particularly as they have been obtained for eight dollars instead of twelve, the latter being the price at which they were offered during the last session of the Legislature.

To defray the expenses to occur under this Act, during the year 1856, I would recommend an appropriation of \$5,000.

It will, doubtless, be necessary for the Surveyor-General, during the year, to visit the several land offices, as well as the offices of many of the County Surveyors, to secure a judicious selection of lands. This constitutes an important item in the above estimated expense.

2. RETURNS OF SCHOOL LAND WARRANT LOCATIONS FOR 1855.

ALAMEDA.

Informal – Nos. 746 and 776 for 160 acres each.

LOS ANGELES.

No. 265 for 320 acres, and 401 for 160 acres.

Previously Returned – No. 166 for 160 acres from Mendocino; No. 400 for 160 acres from Tuolumne, and No. 666 for 160 acres from Alameda.

SAN DIEGO.

Nos. 61 and 62 for 320 acres each.

SAN JOAQUIN.

Nos. 707 and 708 for 160 acres each.

Relocations – Nos. 797 and 798 for 160 acres each.

Relocations – Original Returns not Received – Nos. 1 and 50 for 320 acres each, and 268, 271, 281, 282, 396 and 397 for 160 acres each.

Previously Returned – Nos. 109 and 110 for 160 acres each from Solano.

There appears to be nothing in the Act to provide for the disposal of the 500,000 acres, to prevent the whole being located by one individual, and several thousand acres have been located by one person; therefore I again recommend such a modification of the law as will prevent this species of monopoly hereafter; also such as will prevent fraudulent locations of School Land Warrants.

3. SWAMP AND OVERFLOWED LANDS

Returns of the Swamp and Overflowed Land Surveys, received at this Office prior to January 7, 1856.

COUNTIES	Approved, and Copies sent to Office of Secretary of State.		Not Approved.		TOTAL.	
	No. of Surveys.	No. of Acres.	No. of Surveys.	No. of Acres.	No. of Surveys.	No. of Acres.
Sacramento			3	952.00	3	952.00
San Joaquin	43	11,121.19	2	546.00	45	11,667.19
Solano	2	411.94	28	4,767.55	30	5,179.49
Tulare	4	720.00			4	720.00
Yolo	41	11,520.00	1	160.00	42	11,680.00
Total	90	23,773.13	34	6,425.55	124	30,198.68

All of the above, except the four from Tulare, were accompanied by the affidavit as to the character of the lands, in accordance with the request in my circular of August 25, 1855.

The Act requires these lands to be surveyed by the County Surveyors, "according to instructions from the Surveyor-General of this State, which instructions shall be, as near as practicable, in accordance with the surveys of public lands of the General Government."

On the 13th of June, such instructions as were deemed necessary were issued, together with a copy of the Act, and transmitted to the County Surveyors.

The questionable shape of the returns received, soon furnished convincing proof of the necessity of more explicit instructions, in which I took occasion to remedy, so far as practicable, what were considered the defects of the Act. They were issued on the 25th of August, and, preceded by an abstract containing the main features of the Act, were ordered to be inserted thirty times in the *State Journal*, twenty times in the *Times and Transcript*, fifteen times in the *Sacramento Union*, twelve times in the *San Joaquin Republican*, and six times in the *California Express*. They may be found in Appendix B.

It is believed that the Act for the sale of the Swamp and Overflowed Lands, is premature and very defective, and that it should have been preceded by "An Act to secure to California the Lands to which she is entitled under the Act of Congress," approved September 28, 1850.

To accomplish this object it is recommended that the State Surveyor-General be authorized to obtain from the U. S. Surveyor-General, all the township plats containing swamp and overflowed lands, or lands subject to overflow, and to transmit tracings of the same to the County Surveyors, whose duty it shall then be to make an approximate estimate of the amount and value of lands belonging to the State, not thus designated by the U. S. Surveyors on the township plats; also an estimate of the expense of making the surveys, and of obtaining the affidavits, necessary to delineate upon the plats the true boundaries of, and to establish the title of the State to, said lands.

It is also recommended that the Surveyor-General be authorized, when deemed expedient, to require such surveys to be made and such affidavits to be taken, by the County Surveyor, or by some other Surveyor, who should also be a civil engineer; and who should be in all respects subordinate to the Surveyor-General, and should furnish him with a map of the lands surveyed, on which should be delineated the boundary of swamp lands, according to the U. S. Surveys; also the true boundary, according to his own surveys; also the boundaries of any of these lands, which parties may be desirous of obtaining from the State, by purchase or otherwise, the expense of the latter being paid by said parties, and their names entered on the maps.

All information the Surveyor-General might demand, or which the Surveyor might deem of importance, should also be furnished, which, together with a complete map of the lands, should be transmitted with his annual report to the Governor.

The Surveyor-General and his deputies should be authorized to administer the oaths necessary in obtaining the affidavits.

To enable the Surveyor-General to comply with the proposed requirements, I would recommend an appropriation of \$12,000.

With such maps and information as would thus be obtained, a more judicious system, it is believed, than the present might be devised for the disposal of these lands.

Important data, to serve in part as a basis for a general and judicious system for the reclamation of these lands, could thus be obtained; and the devising of such a system is one of the most important and difficult problems to be solved by the engineering profession of this State.

IV. COUNTY BOUNDARIES.

In my former report attention was called to the fact, that the "Act concerning the office of the Surveyor-General," requires that officer, "when called upon by the county authorities of any county, to run any boundary line between such county and an adjoining county," and that during the year he had frequently been called upon to make such surveys, but had been unable to do so for the want of an appropriation; also, that a reference to the reports of County Surveyors, would show the necessity of having many of the boundaries run during the coming year, [1855,] and that "independently of this, the necessity of obtaining data for an accurate map of the State would justify considerable expenditure;" and it was recommended that twenty thousand dollars be appropriated for such surveys.

As nothing was appropriated, for the purpose of enabling the Surveyor-General to comply with the requirements of the Act, in this particular, he did not consider himself under any obligations to regard the applications of county authorities for such surveys, but on applying to the Attorney-General for his opinion in the matter, he was informed that he was "bound by law, when called upon by the authorities of any county, to run any boundary line, etc., and that the claim for such services would be good against the State, but would necessarily require legislative action to secure payment."

The last Legislature passed two special Acts for the survey of county boundaries; one, "An Act to provide for settling the boundary line between the counties of Santa Cruz, Santa Clara and San Francisco," approved May 2nd, 1855; the other, "An Act to establish a prominent [permanent] boundary line between the counties of Stanislaus and Tuolumne," approved May 4th, 1855; neither of which contained an appropriation.

The former Act authorized and required the Surveyor-General to survey, or cause to be surveyed, the boundary line between said counties, and to have a copy of the map of said survey deposited in the Clerk's office of each of said counties, and one in the Surveyor-General's office.

The latter Act contained the following: "The Surveyor-General of this State shall, within ninety days after the passage of this Act, survey and mark, (or appoint some suitable person to survey and mark,) the said boundary line, and shall receive such compensation therefore, as may be allowed by law; *provided*, that he file in the offices of the Clerk's of Stanislaus and Tuolumne counties, within thirty days after the completion of said survey, certified copies of said boundary survey, including marks, courses and distances – retaining one copy to be placed on file in the office of the Surveyor-General of this State."

Had there been an appropriation to defray the expense of county boundary surveys, the best topographical engineers would have been employed, whose services could have been obtained for reasonable salaries, in which case this office might now have been in possession of valuable contributions towards a Topographical Map of the State.

In nearly every instance, as a matter of necessity, the County Surveyor of the county whence came the application, has been deputed, under certain conditions, to make these surveys; there having been but few or no instances in which a competent person, not holding that office, was willing to make the surveys.

For the substance of the Appointment and Instructions under which these surveys have usually been made, I respectfully refer to Appendix C.

1. SURVEYS UNDER SPECIAL ACTS.

STANISLAUS AND TUOLUMNE

Appointment and Instructions issued May 11th. Appointee, Silas Wilcox, County Surveyor of Stanislaus County.

The Act under which the survey was to be made, with which Mr. Wilcox was required to comply fully, was forwarded to him together with the following special instructions: "You will find a monument on Stanislaus River, whence Knight's Ferry bears S. 76° 51', W. 3,650 feet, near Bearing Tree, marked compass bearing, N. 84° 40', E. 240 feet, to monument on boundary between Calaveras and San Joaquin counties. This will be your initial point."

The above monument is the corner of Calaveras and San Joaquin counties, to which reference was made in my former report. It is at the terminus of a line beginning at a "point one mile north of Lemon's Ranch," and running to the Stanislaus River, *through* a "point one mile north of Knight's Ferry."

The law, in describing the boundary of Calaveras County, defines this corner as a "point one mile north of Knight's Ferry," while in describing San Joaquin it defines it as a "point on the Stanislaus River one mile north of Knight's Ferry." [See Compiled Laws, p. 831.

This corner was established by Mr. Whiting, County Surveyor of San Joaquin, and myself, as County Surveyor of Calaveras. It was the result of a compromise proposed by Mr. Whiting, and acceded to by myself, and agreed to by the Commissioner and Court Sessions of our respective counties. It satisfies the law, as well as, or better than any other point can, and should therefore be considered as settled. Several communications have been received during the year from San Joaquin, expressing dissatisfaction with the present location, the reply to which was in accordance with the above opinion.

Mr. Wilcox surveyed the boundary between Stanislaus and Tuolumne, the map and field notes of which were received on the 18th of August; also a statement that he had "made certified copies to file in the offices of the Clerks of said counties, which would be done immediately."

SANTA CRUZ: SANTA CLARA AND SAN FRANCISCO

Appointment and instructions issued May 29th. Appointee, Thos. W. Wright, County Surveyor of Santa Cruz.

In his annual report, dated Oct. 16th, Mr. W. says: "In compliance with your instructions, I have surveyed and marked the line separating this county from the counties of San Francisco and Santa Clara, and will furnish to your office as soon as practicable a map of the line of survey, and the accompanying field notes. I am now collecting the material for the construction of a county map, and as soon as I can complete it, will likewise transmit you a copy of the same."

Nothing further has been received from Mr. Wright.

2. SURVEYS UNDER GENERAL ACT.

(Authorized in compliance with calls from County authorities.)

EL DORADO AND AMADOR.

Application received June 17. Appointment and instructions issued June 22. Appointee, Wm. Henderson, County Surveyor of El Dorado, or Dr. Bradley. Appointment not accepted. Instructions not complied with.

COLUSI AND YOLO.

Application received June 25. Appointment and instructions issued June 26. Appointee, C.D. Semple, County Surveyor of Colusi. Certificates of competency, etc., received Aug. 13. Map and field notes received Oct. 17.

SACRAMENTO AND EL DORADO.

Application received August 10. Appointments and instructions issued August 17.

Appointee, Wm. L. De Witt, County Surveyor of Sacramento County. Map and field notes received Sept. 19.

No accounts having been received, it is presumed Mr. De Witt does not expect compensation from the State.

SIERRA: PLUMAS, YUBA AND NEVADA.

Application received (misaid and forgotten,) August 16. Appointment and instructions issued Sept. 18.

Appointee, County Surveyor of Sierra, or some other competent Surveyor.

The appointment not having been accepted, on the 10th of October W. G. Still, Ex-Deputy Surveyor of Sierra, was appointed, who is supposed to be now engaged in making the survey.

KLAMATH: HUMBOLDT AND SISKIYOU.

Application received Sept. 16. Appointment and instructions issued Sept. 17.

Appointee, T. P. Robinson, County Surveyor Klamath County.

The application called for the survey of one line, an estimated distance of forty miles, and another estimated distance of seventeen miles, the expense being estimated at \$1,150.

PLACER: SACRAMENTO AND SUTTER.

Application received Oct. 6. Appointment and instructions issued Oct. 8.

Appointee, S. A. Young, County Surveyor of placer County. Appointment accepted.

TULARE AND LOS ANGELES.

Application received Nov. 17. Appointment and instructions issued Nov. 20.

BUTTE AND YUBA.

Application received Nov. 20, which being embodied in the report of the County Surveyor, escaped observation until the 6th inst., when in a letter to that officer, a disinclination to authorize any surveys at so late a day was expressed, unless the request should be persisted in by the Board of Supervisors.

STANISLAUS AND MERCED.

On the 13th inst., notice was received from the Clerk of the Board of Supervisors of Stanislaus County, that said Board had "ordered that the County Surveyor proceed *inslanter*, under instructions from the Surveyor-General, to make a survey of the portion of the boundary between the above named counties, lying between the mouth of the Merced River and a point on the San Joaquin River, seven miles below."

The boundary between these counties should be more plainly defined by statute, before surveyed. I respectfully recommend either as an appropriation of \$10,000, to enable the Surveyor-General to survey the county boundaries, when called upon by the county authorities, or a repeal of the clause making it his duty to make such surveys.

3. INDEFINITE, DISPUTED AND OBJECTIONABLE BOUNDARIES.

The "Act dividing the State into counties and establishing seats of justice therein," and many of the Acts supplementary thereto are very defective, and while many of their defects are important and demand immediate removal, those of less consequence, being neither useful nor ornamental, should be expunged.

The County Surveyors, County Assessors and Boards of Supervisors have been requested to furnish any suggestions for the improvement of the boundaries of their respective counties by substituting natural for artificial [arbitrary] ones, or the lines of the United States Surveys for the present lines, or any other changes with a view to a better and more permanent subdivision of the State.

The importance of the subject has induced me, in some cases, to condense their suggestions, in others to refer to the reports in which their suggestions may be found; also to present such remarks, as from the examination I have been able to give the subject, appear to be judicious.

ALAMEDA.

The County Surveyor says, that as at present defined, it would be almost impossible to run the boundaries except by agreement. He quotes the description, points out its objectionable features, and suggests that some action should be taken in this matter as soon as possible, and the boundary established.

[See Reports of Surveyors of Alameda, San Joaquin and Santa Clara; also Statutes Cal. 4th Session, p. 56, 1853.]

AMADOR.

The Assessor of El Dorado points out very objectionable features in the present boundary between Amador and El Dorado. He says it crosses the Consumnes River four times within the distance of eight miles; also, that the river would have been a far better boundary, which is undoubtedly true.

He recommends, however, the substitution of Dry Creek, and says the people prefer it. [See Report; also Stat. Cal. 6th Session, p. 113, 1855.]

BUTTE.

A dispute exists between Butte and Yuba as to whether the North or the South Fork of the Honcut is the boundary. The Surveyor and Assessor of Butte contend for the South and the Assessor of Yuba for the North Fork. Butte appears to have the best of the argument. [See Reports; also Stat. Cal. 4th Session, p. 53, 1853.]

COLUSI.

The Surveyor proposes great changes. [See Report.]

EL DORADO.

See Assessor's Report; also Amador.

LOS ANGELES.

The Surveyor of Los Angeles and the Assessor of Tulare differ materially as to the definitiveness of the boundary between the two counties. [See Reports; also Stat. Cal. 3rd Session, p. 240, 1852.]

MARIN.

The Assessor recommends the immediate survey of the only arbitrary boundary to this county, (the Surveyor estimates its length at twelve miles), and says much trouble has arisen and more will arise if it be not surveyed.

MERCED.

The Surveyor proposes a change of boundary; says the present one between Merced and Mariposa is a road very crooked, and changes perhaps every three months.

NEVADA.

The Surveyor proposes and gives reasons for a change in the boundary. [See Report; also Report of Assessor of Sierra.]

SAN DIEGO.

The County Surveyor, Charles H. Poole, has furnished an interesting article upon "County Boundaries" in his Report, to which I would refer.

SAN JOAQUIN.

The Surveyor says that about the position, upon the ground of the line between San Joaquin and Alameda, there is great difference of opinion, and that the line should be run and proper monuments set up. [See Report; also Report of Surveyors of Alameda.]

SAN LUIS OBISPO.

The Surveyor proposes to annex about half of Santa Barbara County; proposes also a change in the northern boundary.

SANTA CLARA.

The Surveyor says that it is important that thirty miles of the north-eastern boundary should be run during the ensuing year, and estimates the expense at \$30 per mile.

SIERRA.

The Assessor says the boundaries are not sufficiently defined; that the statute calls for a line that does not exist, etc. [See Report.]

SOLANO.

The Surveyor proposes important changes; if made, only thirty miles of boundary require to be run. Suggestions approved in part by the Surveyor of Yolo. [See Reports.]

SUTTER.

The Surveyor proposes important changes. [See Report.]

4. OTHER DEFECTS OF, AND PROPOSED AMENDMENTS TO, THE SEVERAL ACTS DEFINING COUNTY BOUNDARIES

NOTE – The portions considered objectionable are inclosed in parentheses; those proposed to be inserted are inclosed in brackets.

CONTRA COSTA.

Appears very defective, but I am unable to suggest the proper amendments.

EL DORADO.

“Thence in a due east (erly) direction to the boundary of the State.” Comp. L. p. 832.

HUMBOLDT.

“Thence north” [erly] “to the point of beginning.” Stat. Cal. 4th Session, p. 161, 1853.

KLAMATH.

“Thence (due) north” [easterly] “along (said)” [the north] “western boundary of Trinity County.” Stat. Cal. 6th Session, p. 200.

LOS ANGELES.

“At a point (parallel)” [in line] “with the northern boundary of the rancho, called Malaga, and (opposite to)” [in line with] “the (southern)” [northern] “boundary of the rancho called Malaga.” Comp. L. p. 828.

MARIN.

“Parallel with the coast to” [a point opposite to, and three miles from, the place of beginning; thence] “to the place of beginning.” Stat. Cal. 5th Session, p. 121.

MONTEREY.

“And thence parallel with the coast to” [a point three miles west of] “the place of beginning,” [thence east to the place of beginning.] Comp. L. p. 829.

NAPA.

“A point (parallel)” [in line] “with the Southern boundary line of the Rancho,” etc., “to a point on the top of said mountains, (one mile east of the eastern boundary line) of the rancho known as Fitch’s Rancho, on Russian River.”

NOTE – The center or some other point in the “eastern boundary line,” should be designated. Stat. Cal. 6th Session, p. 77, 1853.

NEVADA.

“Thence east (erly) in a straight line,” “thence west (erly) on the northerly line of Placer County.” Stat. Cal. 3rd Session, p. 191, 1852.

PLACER.

“To a point ten miles” [by the river] or [in a direct line] “between the junction of Sacramento and Feather Rivers.” Comp. L. p. 832.

SACRAMENTO.

“Beginning at a point ten miles due north of the” [mouth of] or some other point in the] “American river,” “to a point on the Cosumnes River, eight miles” [in a direct line] “above the house of Wm. Daylor.” Comp. L. p. 830.

SANTA BARBARA.

“Thence north-east” [erly] “to summit of the Coast Range.” Comp. L. p. 828.

SHASTA.

“Thence along the southern boundary line of Siskiyou County in an east (erly) direction.”

SIERRA.

“Ten miles” [by the river] “from its mouth,” “running thence in a north (westerly) [erly] direction,” “thence (westerly)” [northerly] “to a point on the dividing ridge,” (“thence northerly following out said ridge,” “thence east (erly) in a straight line,” “thence west” [erly] “following the northerly line of Nevada County.” Stat. Cal. 3rd Session, p. 231, 1852.

SISKIYOU.

“And (from) thence” [south] “across Klamath river,” [thence] “running in a south-easterly course along the summit,” etc. Stat. Cal. 3rd Session, p. 233, 1852.

STANISLAUS.

“Continuing the same (parallel) direction.” Stat. Cal. 6th Session, p. 245.

SUTTER.

“Beginning at a point in the middle of the Sacramento River, ten miles” [[in a direct line] or [by the river]] “below the junction of the Sacramento and Feather Rivers.” Stat. Cal. 5th Session, p. 26, 1854.

TUOLUMNE.

“And following in (an)” [a north] “easterly direction,” “thence in a (north)” [south] “easterly direction,” “thence following the top of said ridge down to the plains,” [[thence to a point in the San Joaquin River, seven miles, [in a direct line] or [by the river]] “below the mouth of Merced River.” Comp. L. p. 832.

NOTE – This last description mostly belongs now to Stanislaus County.

YOLO.

“Point due west from a point in the Sacramento River, ten miles” [in a direct line] “below the head of Sycamore Slough.” Comp. L. p. 836.

YUBA.

“East” [erly] “up the middle of said creek,” “ten miles” [by the river] “from its mouth,” “thence east (erly) in a straight line,” thence west (erly) to the said dividing ridge. Comp. L. p. 833.

NOTE – The latter two errors now affect Sierra instead of Yuba.

PLACER – SUTTER.

The statute defines the south-western corner of Placer, as a “point ten miles below the junction of Sacramento and Feather Rivers;” and the most southerly corner of Sutter, as a “point in the middle of Sacramento River, ten miles below the junction of the Sacramento and Feather Rivers.”

SACRAMENTO – EL DORADO.

It defines one corner of Sacramento, which belongs also to El Dorado, as a “point on the Cosumnes River, eight miles above the house of Wm. Daylor.”

SIERRA – YUBA.

Also, one corner common to Sierra and Yuba, as a point ten miles from the mouth of the Middle Branch of the Yuba River.

YOLO – COLUSI.

And one corner of Yolo, belonging also to Colusi, as a “point in the Sacramento River, ten miles below the head of Sycamore Slough.’

In the above four cases, and in all similar ones, (except there be evidence that the Legislature intended otherwise,) I should decide that the most natural mode of complying with the statutes, would be by measuring the respective distances by the river. I am satisfied, however, that this would be an injudicious decision in the case of Sacramento and El Dorado.

I am informed that more than three years since, the County Surveyor of Sacramento, under instructions from the late Surveyor-General, Wm. M. Eddy, Esq., located the point on the Cosumnes River, by running eight miles in a direct line from Wm. Daylor's house, since which time, I am informed, Sacramento has exercised jurisdiction accordingly. At the same time the common corner of El Dorado, Sacramento, Calaveras and San Joaquin, which was a point on Dry Creek, due south of the point on the Cosumnes, was located, and was afterwards used by Mr. Whiting and myself as the initial point for our survey of the boundary between San Joaquin and Calaveras, I protesting against the decision, but being obliged to submit. To change this point now, would be to change the boundary between Sacramento and Amador, and between Calaveras and San Joaquin.

For the above reasons I did not, when authorizing Mr. De Witt to survey the boundary between Sacramento and El Dorado, deem it judicious to reverse the decision of my predecessor.

The point in the Sacramento River, ten miles below the head of "Sycamore Slough," was located by the Surveyor of Colusi, by running ten miles below in a direct line, and he says that the same is in accordance with the statute, as understood by both the people and the authorities of the counties interested, and gives general satisfaction.

The same ambiguity exist in section sixth of the "Act concerning Public Ferries and Toll Bridges," approved April 28, 1855. See St. Cal., 6 S. p. 183, 1855.

I would recommend an explanatory Act, defining what construction shall be put upon the phrases in question.

V. COUNTY ROADS.

In my former report the opinion was expressed that “a good common road system was certainly not one of the least desirable objects to be attained by judicious legislation;” also, that this State was not then in possession of such a system, and with a view to aid in the attainment of the desired object, certain suggestions were submitted, a part of which found sufficient favor with the last legislature to be embodied in the “Act concerning Roads and Highways,” and all have been “heartily endorsed” by one at least of the best authorities in the Atlantic States, and it is believed have been generally approved, so far as examined by those in this State most competent to judge their merits.

On attempting to devise a system for the location and construction of roads, the first questions that naturally arises is, how shall means be raised to defray the necessary expense? With a view to answer this important question, I remarked: “The attempt to construct roads wholly by a poll-tax of labor, is inexpedient, and unjust, and in this and other States, has resulted in miserable failures. I recommend that it be abolished, and a poll-tax of money substituted; and as the value of property is increased by improving roads, I would also recommend a property tax, to raise a fund to be expended wholly in laying out and constructing roads and bridges.”

These suggestions met with the approval of the last Legislature, and are embodied in the “Act concerning Roads and Highways,” now in force in this State. Thus has been expunged from our statute book the poll-tax of labor, which not for so long a time some of the Atlantic States rendered road-making (so called,) a ridiculous but not harmless farce. The former was wholly a poll-tax of labor, the present is both poll and property tax in money. This is truly a great improvement, but we should advance a little further. Section six of the “Act concerning Roads and Highways,” reads thus: “The Boards of Supervisors shall have power to levy a road-tax on all able-bodied men between the ages of twenty one and fifty years, which shall not exceed *four dollars* per annum, and a property tax which shall not exceed *five cents* on each one hundred dollars, for road purposes,” etc.

In the above apportionment, property does not bear its just proportion of the expense of constructing roads, and it is believed to be injudicious to leave the Supervisors to determine the amount to be collected for road purposes. It is therefore recommended that this section be so modified that a poll tax of *two dollars* shall be levied on all able-bodied men between the above named ages, and a property tax of *twenty cents* on each one hundred dollars, to be expended wholly in laying out and constructing roads and bridges. Property is the source whence the greater portion of the road tax should be derived, and it is fully believed that its increase in value, and the decrease in the expense of one year’s traffic, consequent upon the improvement of roads, would, if judiciously expended, more than equal the expense of constructing good roads wherever needed throughout the State. No tax should be paid more willingly than that for roads, and none will return more abundant rewards to the taxpayer, under a good road system, and this can be seen by every one after a road has been properly constructed, yet few taxes have been paid less willingly, and few have been expended less judiciously than the road tax; and this, too, can be seen by most of those who traveled extensively in this and other States.

How, then, shall we secure a judicious expenditure of the money raised? By having the roads properly laid out and properly constructed. They are laid out properly, when upon the shortest, most level, and most economical route, in a word, upon the *best route*, all things considered, but to consider all things, and select the best, in the location of a *common road*, is by no means the easy matter that many suppose. Dr. Lardner says: "I do not know that I could suggest any one problem to be proposed to an engineer, which would require a greater execution of scientific skill and practical knowledge, than laying out a road."

In my former report it was suggested that roads should be laid out, in all cases, by skillful civil engineers, and not by them without a survey embracing the taking of levels, as well as the courses and distances; also, that none but civil engineers should be eligible to the office of County Surveyor, after the expiration of the term of office of present incumbents; that no man was competent to select the best possible route for a common road without the use of a leveling instrument of some kind, for the reason that a change of grade so slight as scarcely to be perceived by the unaided eye, may increase or diminish the force of traction fifty percent.

Few, if any, who have not examined the subject professionally, are fully aware of the great advantages to easy grades.

The following *data* I extract from "Gillespie's Manual of Road-Making;" a work that has received the highest commendations from the best authorities in the Atlantic States, and the substances of which should be in the hands and *head* of every one who attempts to lay out and construct roads:

Calling the load which a horse can draw on a level	1.00
On a rise 1 in 100, a horse can draw only	⁴ .90
" " 50, " " 	⁴ .81
" " 44, " " 75
" " 40, " " 	⁵ .72
" " 30, " " 	⁵ .64
" " 26, " " 	⁵ .54
" " 24, " " 50
" " 20, " " 	⁵ .40
" " 10, " " 	⁴ .25

Thus we see that on a grade of 1 in 44, a horse can draw but three-quarters as much as he can upon a level; on a slope of 1 in 30, less than two-thirds; on a slope of 1 in 24, only one-half; and on a slope of 1 in 10, only one-quarter as much.

As the above data have been established by experiment, they cannot be reasonably questionable.

The questions of grades is but one of many that must be considered in laying out roads, and to say that a skillful civil engineer is the most competent to discuss and decide these questions, is a proposition that should be doubted by those only who doubt that a skillful military man is the most competent to command an army; a skillful

⁴ Gayffier

⁵ Parnell

physician and surgeon to take charge of a hospital; a man learned in the law for a judge; or a good blacksmith to shoe horses.

Yet, the "Act concerning Roads and Highways," passed by the last Legislature, is based upon the opposite proposition; Section 9, requiring the "Board of Supervisors of each county, on presentation of petition, praying for a county road to be laid out within the county, if they shall be of the opinion that such road is necessary, to appoint two persons as Viewers to view out and locate said road; and upon a return of the certificate of the Viewers, to declare the same to be a public highway." It says, that "When absolutely necessary, the County Surveyor may be called in by the Supervisors, to assist in said location."

I respectfully recommend such modification of Section 9, as will *require* the services of the County Surveyor in all cases, except those in which that officer is not a civil engineer, in which cases one who is an engineer should be appointed.

Under the present system, viewers are appointed who know nothing of the business they attempt, and have no professional reputation to lose, and who wish the road to run where it will benefit them – instead of the public, and the consequence is, that California is cursed with many public highways laid out and partially constructed (at an expense sufficient to have laid out and constructed good roads on the proper routes) on routes, where good roads never can be made, and therefore must be ultimately abandoned.

IN my former Report it was suggested, that the County-Surveyor and Engineer should have the general supervision of the roads in the county, and should as early as practicable make out an apportionment of the Road Fund on a proper basis, reserving a part of said fund for contingencies, which apportionment should be submitted for the approval of the Board of Supervisors; that the County Surveyor and Engineer should lay out all new roads, make maps and profiles of the same, also plans for bridges, etc., and an estimate of the cost of construction, and of the amount of traffic; and that, with a view to the improvement of the routes, all the roads in the county should be surveyed as soon as practicable; also, that the County Surveyor and Engineer, after his plans and specifications shall have been approved, [by the Board of Supervisors,] should proceed as soon as practicable, under proper restrictions, to effect the proposed improvements. It was also suggested, that works involving considerable expenditure, might be most economically constructed under the contract system, and that in all cases the work should be constructed in accordance with the specifications, and to the acceptance of the engineer.

It was also recommended that all the plans, profiles, specifications, estimates, etc., as well as the actual cost of construction, by items; also the maps, made on some convenient scale, designated by the Surveyor-General, to secure uniformity, embracing the topography of as much of the surrounding country as circumstances would permit, should be forwarded to this office; and it was remarked that from data thus obtained, and those to be obtained from the survey of county boundaries, also from the United States surveys and other sources, an accurate map of the State could be compiled at no very distant day.

In view of the disposition exhibited to reduce the salaries and fees of all those offices which require in their incumbents scientific knowledge and practical skill that can only be acquired by many years of theoretical and practical training, it was suggested

that the compensation should be such as to induce skillful engineers to desire the office of County Surveyor and engineer, and that none should be required to render services without a fair remuneration; for it is in vain for a State or county to expect the services of competent and honest men at rates far below those which may be obtained from individuals, and concluded thus: "Feeling confident that the proposed system would be a great improvement upon the present one, the only argument in favor of which, so far as I am aware, is, that it has been very extensively adopted, but never with good results, I present the same, anxiously hoping it may be adopted."

My confidence in the proposed system is undiminished, and I would again commend it for consideration, being well assured that until it shall have been substantially adopted, our roads will not be what they should be. I would refer to remarks upon this subject in the reports of the County Surveyors of Butte, Marin, San Joaquin, Santa Clara, Santa Cruz and Shasta Counties.

VI. MAP OF THE STATE.

I have had occasion preciously to remark, that the official map of California is comparatively worthless, in consequence of its great inaccuracy, and to recommend certain measures by which a better one might be obtained. To discuss the necessity of having an accurate map of the State, would be to insult the understanding of every intelligent man. I have therefore considered it a self-evident proposition. Under the head of "County Roads," and of "County Boundaries," may be found some suggestions concerning a State Map.

I would repeat the recommendation, that Railroad and Wagon Road Companies be required to send to this office maps of their respective roads, made on such scale as the Surveyor-General may designate, which shall exhibit accurately the topography of the adjoining country. For some valuable remarks upon a State Map, I would respectfully refer to the Report of Hon. Sherman Day, Chairman of the Senate Committee on Public Lands, of the last session, Doc. No. 17, App. to Senate Journal. I would also refer to remarks upon the same subject by Chas. H. Poole, County Surveyor of San Diego County, in his valuable Report of this year, which may be found in Appendix D.

1. GEORGE H. GODDARD'S TOPOGRAPHICAL MAP

Geo. H. Goddard, Civil Engineer, has compiled a Topographical Map of the State of California, and of the Great Basin of Utah, with a portion of New Mexico; also the Gadsden Purchase; containing, in fact, all that is absolutely known of this portion of Western America, from the Rocky Mountains to the Pacific Ocean. The California portion of this map is based upon the United States' Land Surveys, and contains all the information obtainable from the source up to the present time. The coast line is from the U. S. Coast Survey. The results of the U. S. Explorations by Fremont, Emory, Stansbury, Sitgroaves and Marcy; of the Boundary Surveys between the United States and Mexico; of the late Railroad Explorations of Williamson, Whipple, Gunnison, Beckwith and Park; of the several surveys furnished by County Surveyors and others; of the Northern Boundary Survey by Mr. Robinson, under instructions from the office; of Mr. Goddard's own surveys in Mariposa, Tuolumne, Calaveras and El Dorado Counties; and of his explorations under Lieut. Moore, U. S. A., in the southern portion of the Great Basin for the San Francisco Railroad Committee, all are embodied in Mr. G.'s Map.

It will contain, also, the results of the recent Eastern Boundary Survey made by Mr. Goddard, and of the Immigrant Wagon Road Explorations and Surveys made by Messrs. Day & Goddard, under instruction from this office, during the past season.

The Map is left blank in those portions which have not been surveyed or explored, so that additional information can be inserted from time to time as obtained.

This Map should be in the Surveyor-General's office of this State, containing, as it does, so far as possessed, precisely the information needed by that officer to enable him properly to carry forward such further explorations and surveys as will doubtless be ordered for the location of other immigrant wagon roads, and such as should be ordered for the purpose of testing the practicability of the various Passes in the Sierra Nevada for a railroad.

One important object of procuring the services of Mr. Goddard during this past season, was the securing the use of his Map in this office.

Mr. Goddard will dispose of his Map for \$2,000 in cash – the same price at which it was offered to the last Legislature, although it contains much, and will contain still more, additional matter.

I would most respectfully and urgently recommend its purchase by the State and I am fully satisfied that nowhere else can so complete, accurate and extensive a Map be obtained.

VII. STATISTICS.

1. REPORTS FROM COUNTY SURVEYORS

In my former Report I called attention to the fact, that reports had been received from but nineteen County Surveyors, for the year 1854.

The same number has been received for the year 1855. For the year 1853, my predecessor received but three.

List of County Surveyors from whom Reports have been received for the year 1855.

H. A. Higley,	County Surveyor of	Alameda.
J. W. Scott,	“ “	Butte.
C. D. Semple,	“ “	Colusi.
Henry Hancock,	“ “	Los Angeles.
A. D. Easkoot,	“ “	Marin.
Erastus Kelsey,	“ “	Merced.
John Day,	“ “	Nevada.
J. C. Church,	“ “	Plumas.
Arvin M. Stoddard,	“ “	San Bernardino.
Chas. H. Poole,	“ “	San Diego.
J. J. Gardiner,	“ “	San Francisco.
Geo. E. Drew,	“ “	San Joaquin.
Lucien B. Healy,	“ “	Santa Clara.
Thos. W. Wright,	“ “	Santa Cruz.
A. H. Stout,	“ “	Shasta.
E. M. Stevens,	“ “	Siskiyou.
H. Patton,	“ “	Solano.
Phil. E. Drischer,	“ “	Sutter.
William Minis,	“ “	Yolo.

The above, together with one (for 1854) received from Daniel Small, County Surveyor of Contra Costa, may be found in Appendix D.

The following remarks, from my former Report, I again commend as worthy of consideration:

“Nearly all of the above named reports contain valuable information or suggestions, yet for the labor extended in obtaining this information, County Surveyors are allowed no compensation which, in my opinion, is neither just nor expedient. It is, therefore, respectfully recommended that the laws be so modified that they may receive reasonable compensation for all services rendered by them; also, that such penalties be affixed as will insure a faithful performance of all their duties.

I respectfully recommend that the County Surveyors be required to make such meteorological observations as the Surveyor-General may consider requisite, and keep a record of the same, a copy of which shall be sent to this office.

By special Acts, some of the County Surveyors are now provided with offices, while others are not. It is recommended that all be supplied at the expense of the counties.”

I might particularize many of these reports, but must content myself with mentioning that of Chas. H. Poole, Esq., County Surveyor of San Diego County, which is the longest and the best.

I would recommend an appropriation of \$4,000 to be used by the Surveyor-General in obtaining a set of Meteorological Instruments for each County Surveyor in the State, to be used by the latter under instructions from the former.

I am informed that sets of the best kind, such as are manufactured for the Smithsonian Institute, by Mr. Green, of New York, can be obtained for about \$70 cash.

Should the above suggestions be adopted, and a worthy prize be offered for the best essay upon the Meteorology, and one for the best Meteorological tables, of California, I do not doubt that this State might present a contribution to this science of great value, and of which she might be justly proud.

It is little she has heretofore done to advance this or any other science – scarcely sufficient to justify her, (except to her own citizens,) in claiming that her population is more enlightened and intelligent than that of any other State or Nation.

2. REPORTS FROM COUNTY ASSESSORS.

List of County Assessors from whom Reports have been received for the year 1855.

C. C. Breyfogle, (per R. P. Ranney, Dep.,)	County Assessor of	Alameda.
H. A. Eichelberger,	“ “	Amador.
Miles Chapin,	“ “	Butte.
A. W. Dunn,	“ “	Colusi.
J. McKnight,	“ “	El Dorado.
A. F. Coronel,	“ “	Los Angeles
Warren Dutton,	“ “	Marin.
John Cobb,	“ “	Napa.
John McCoy,	“ “	Nevada.
A. S. Smith,	“ “	Placer.
Christ. Porter, (by M. R. Streeter, Dep.,)	“ “	Plumas.
H. J. Bidleman,	“ “	Sacramento.
V. Johnson Herring,	“ “	San Bernardino.
E. B. Pendleton,	“ “	San Diego.
S. A. Hurlburt,	“ “	San Joaquin.
S. A. Pollard, Dep.	“ “	San Luis Obispo.
J. H. Morgan,	“ “	Santa Clara.
John F. Pinkham,	“ “	Santa Cruz.
Wm. S. Hughes,	“ “	Shasta.
Francis M. Proctor,	“ “	Sierra.
H. B. Ammons,	“ “	Solano.
Smith D. Towne,	“ “	Sonoma.
E. B. Beard,	“ “	Stanislaus.
D. H. Durkee,	“ “	Sutter.
D. W. Potter,	“ “	Trinity.
J. B. Hatch,	“ “	Tulare.
D. P. Diggs,	“ “	Yolo.
Mix. Smith,	“ “	Yuba.

My predecessor received but two reports from the County Assessors for the year of 1853. For the year of 1854 eleven were received, while for 1855 twenty-eight have been received, all of which may be found in Appendix E.

The character of the reports is still more improved than the number, as may be seen by the most cursory glance, but which nothing will render so apparent as a comparison of the statistical table and notes in this Report, with those in my former one.

In that Report I remarked as follows:

“I know of no reasonable excuse for a failure on the part of County Assessors to comply with the present laws in regard to the collection of statistics for this office.

I respectfully recommend that it may be made unlawful to audit or settle their accounts, until they declare on oath that they have complied in this respect, to the best of their ability, with the Statutes.”

As the above suggestion met with no favor from the last Legislature, I was induced to send circulars to the Boards of Supervisors of the State, in which they were urgently requested to co-operate with me in effecting a strict compliance with the law, in regard to the collecting and sending in of statistics.

Some of the Boards have complied, but others, I am informed, refused to allow any compensation for the above purpose.

In view of the importance of having correct statistics from the whole State, I would repeat the recommendation quoted above, as well as the following:

“I would also recommend that Railroad Corporations be required to report to this office, as in the State of new York, the amount of stock, debts, cost of construction and equipments, the amount of business, both passengers and freight, cost of maintenance of road-way, of repairs of machinery, of operating, their earnings, receipts and payments; number, kind and cause of accidents; and all other useful information which the State may with propriety demand.

Analogous requirements, varies to sure the nature of the cases, might be made of Wagon Road and Telegraph Companies.

With such changes in the present laws as are recommended, this office may in a short time, with trifling expense, become a storehouse of information of great value to the people of this State, and of great use to those whose province it is to make our laws.”

3. REPORTS FROM OTHERS.

To Wm. Patton, Civil Engineer of Calaveras, I am indebted for all the statistics obtained from that county. His report, to which I would call attention, constitutes Appendix F.

To Mix Smith, Esq., the Assessor of Yuba County, I am indebted for a valuable and interesting contribution from Beach & Shepard, upon the "New England Nursery." It constitutes Appendix G.

I had received an interesting communication from Wm. S. Watson, Civil Engineer, upon "Mining Canals and Ditches," from which a few notes have been taken, but as the communication has been unfortunately mislaid, I am unable to transmit it.

In compiling, with no small amount of labor, the following statistical table and notes, I have thought proper to confine myself, almost exclusively, to the information received officially.

Should it be thought advisable to have the census taken during the year 1856, I would earnestly recommend that the duty be imposed upon the Assessors, in which case, the additional expense incurred would be comparatively small.

I had made a list of the Assessor's Reports deserving special commendation but omit it because of length.

4. STATISTICAL TABLE. *(next page)*

STATISTICS COMPILED FROM REPORTS OF COUNTY SURVEYORS AND COUNTY ASSESSORS, FOR THE YEAR 1855.

AGRICULTURAL PRODUCTS.

COUNTIES.	Acres of Land Cultivated.		Wheat.		Barley.		Oats.		Corn.		Potatoes.		Acres in Vegetables.		Hay.		Pounds of Wool.	Pounds of Butter.	Pounds of Cheese.
	Acres.	Bushels.	Acres.	Bushels.	Acres.	Bushels.	Acres.	Bushels.	Acres.	Bushels.	Acres.	Bushels.	Acres.	Bushels.					
Alameda...	54,724	21,938	460,000	753,720	9,637	481,850	412	16,480	4,514	338,450	2,175	2,700	24,918	133,390	100,000				
Amador...	4,329	1,006	26,980	29,375	828	18,740	--	--	--	--	300	1,200	--	--	--				
Butte...	--	1,865	46,265	72,000	175	5,250	18	--	--	--	--	--	--	--	--				
Colusa...	12,287	6,500	101,050	94,066	75	1,500	--	--	--	--	125	1,750	--	--	--				
El Dorado...	--	450	11,700	9,520	387	9,768	--	--	--	--	--	--	--	--	--				
Los Angeles...	23,000	--	17,833	--	--	1,565	--	50,158	--	11,166	--	--	50,000	--	--				
Marin...	--	2,490	--	744	894	--	--	--	859	--	--	--	--	--	--				
Napa...	15,000	11,058	132,696	31,680	770	--	488	--	61	--	224	700	11,197	58,310	17,537				
Nevada...	4,300	1,100	--	1,500	350	--	50	--	300	--	300	--	--	--	--				
Plumas...	--	--	5,765	854	--	1,015	--	5	--	2,530	--	--	--	2,000	--				
Sacramento...	--	5,191	129,775	163,410	1,547	--	204	--	303	--	996	--	--	56,136	49,940				
San Bernardino...	--	--	12,000	16,200	--	--	--	2,300	--	--	--	--	--	--	--				
San Diego...	--	--	3,000	15,000	--	--	--	15,000	--	--	--	--	--	--	--				
San Joaquin...	--	10,197	198,841	346,470	1,988	47,712	118	4,130	27	1,350	--	2,000	--	--	--				
San Luis Obispo...	--	300	6,000	3,000	--	--	--	2,000	--	5,000	--	--	4,000	2,000	2,000				
Santa Clara...	25,975	20,000	240,000	75,000	2,000	66,000	300	6,000	300	15,000	--	4,670	--	--	--				
Santa Cruz...	--	4,000	30,000	54,000	1,200	14,000	90	3,150	500	15,000	--	4,670	--	2,000	--				
Shasta...	--	2,898	65,378	74,885	239	4,956	203	5,143	142	14,780	--	--	--	--	--				
Sierra...	319	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
Siskiyou...	7,950	3,000	60,000	24,000	1,500	37,500	250	--	600	60,000	1,400	--	--	--	--				
Solano...	16,707	7,264	--	5,202	721	--	724	--	--	--	--	--	--	--	--				
Sonoma...	22,400	12,233	77,000	49,952	3,268	98,040	714	28,560	1,693	--	500	--	14,500	--	--				
Stanislaus...	6,989	3,684	55,260	44,620	420	--	147	--	--	--	--	--	--	--	--				
Sutter...	--	--	15,800	314,080	--	1,207	--	--	--	21,100	--	--	--	7,180	30,000				
Trinity...	2,900	848	--	655	125	--	64	--	360	--	141	63	--	--	--				
Tulare...	2,750	1,500	--	1,000	30	--	200	--	--	--	20	--	--	--	--				
Yolo...	40,000	13,000	600,000	800,000	30,000	120,000	300	9,000	--	--	--	--	2,000	--	10,000				
Yuba...	18,000	1,845	36,900	54,975	220	4,400	35	1,400	--	--	--	--	--	--	--				

⁶ Mendocino included.

No reports have been received from Calaveras, Contra Costa, Humboldt, Klamath, Mariposa, Monterey, Santa Barbara and Tuolumne Counties. Nothing of importance received from Merced and San Francisco Counties. For Placer County, see Notes. In the following Counties the Wheat Crop for the past season has been thus estimated: Contra Costa, 3,000 acres, 45,000 bushels; Monterey, 1,600 acres, 24,000 bushels; Placer, 3,000 acres, 75,000 bushels; San Francisco, 1,000 acres, 20,000 bushels; Santa Barbara, 400 acres, 8,000 bushels.

STATISTICS COMPILED FROM REPORTS OF COUNTY SURVEYORS AND COUNTY ASSESSORS, FOR THE YEAR 1855.

LIVE STOCK.

COUNTIES.	Horses	Mules.	Asses.	Oxen.	Cows.	Calves.	Total Cattle.	Sheep.	Swine.	Goats.
Alameda...	4,132	945	50	1,034	3,432	2,061	17,745	8,306	4,641	482
Amador...	535	175	88	453	630	--	1,803	934	2,550	150
Butte...	1,588	376	27	--	--	1,350	7,236	3,636	7,550	127
Colusi...	1,604	262	--	930	1,748	867	13,064	4,122	5,761	4
El Dorado...	907	384	65	690	769	519	3,259	654	4,620	--
Los Angeles...	19,840	1,299	260	1,546	2,146	--	106,159	28,538	1,900	600
Marin...	3,522	--	--	--	--	--	17,775	2,589	4,027	--
Napa...	4,114	290	--	3,616	9,093	--	17,379	5,396	12,011	65
Nevada...	71,500	--	--	--	--	--	2,300	--	7,800	--
Plumas...	7,441	--	65	--	--	--	715	--	1,000	--
Sacramento...	1,906	231	11	--	4,860	2,749	10,943	7,678	5,949	93
San Bernardino...	1,356	191	--	--	--	--	14,501	7,304	994	106
San Diego...	3,650	300	--	300	--	--	18,300	3,200	2,000	--
San Joaquin...	3,511	1,146	30	--	--	--	16,326	4,075	20,298	296
San Luis Obispo...	3,000	200	50	200	1,000	--	41,200	2,500	--	--
Santa Clara...	5,650	433	73	1,621	4,050	3,165	20,637	10,000	15,000	925
Santa Cruz...	1,375	175	--	700	1,000	--	6,900	2,200	3,400	40
Shasta...	790	1,097	35	1,086	837	1,023	2,946	175	3,717	15
Sierra...	89	938	27	--	214	46	422	314	1,571	13
Siskiyou...	1,000	2,500	--	--	--	--	3,000	200	1,500	--
Solano...	2,945	278	--	--	--	--	22,179	14,279	16,415	162
Sonoma ⁸ ...	4,958	323	5	2,771	7,925	5,750	26,250	7,065	19,459	75
Stanislaus...	1,210	--	--	--	--	--	9,937	3,747	1,416	100
Sutter...	1,200	607	--	--	--	--	15,180	2,521	7,235	--
Trinity...	125	713	75	125	200	83	408	--	--	--
Tulare...	487	--	--	--	856	--	3,634	856	1,397	1,000
Yolo...	6,000	--	--	--	--	--	23,000	2,000	35,000	--
Yuba...	1,272	1,074	--	--	--	--	6,045	805	5,378	--

⁷ Horses and Mules.

⁸ Mendocino included.

STATISTICS COMPILED FROM REPORTS OF COUNTY SURVEYORS AND COUNTY ASSESSORS, FOR THE YEAR 1855.

IMPROVEMENTS.

COUNTIES.	Fruit Trees and Vines.										Flour Mills.			Saw Mills.			Quartz Mills.			Mining Ditches.		Bridges.	Fertiles.	
	Peach.	Apple.	Pear.	Cherry.	Plum.	Apricot.	Quince.	Fig.	Total Fruit Trees.	Grape Vines.	Steam Power.	Water Power.	Total.	Run of Stones.	Steam Power.	Water Power.	Total.	Number.	Length in Miles.	Value.				
Alameda...	46,449	49,667	4,780	4,717	3,710	2,000	1,728	140	113,991	55,480	2	1	3	10	--	--	--	--	--	--	1	--		
Amador...	1,438	927	--	--	--	--	--	--	2,465	4,730	1	1	2	4	9	6	15	30	300	\$450,000	--	--		
Butte...	--	--	--	--	--	--	--	--	--	--	--	2	2	4	4	10	14	--	--	--	--	1	--	
Colusa...	200	--	--	--	--	--	--	--	200	--	--	--	2	4	--	--	--	--	--	--	--	1	10	
El Dorado...	1,159	1,608	34	39	40	15	25	12	2,932	3,000	--	1	1	--	24	16	40	20	800	--	--	15	--	
Los Angeles...	--	--	--	--	--	--	--	--	--	--	--	2	2	--	--	--	--	--	--	--	--	--	--	--
Marin...	--	--	--	--	--	--	--	--	2,500	--	--	--	--	--	4	--	4	--	--	--	--	--	--	--
Napa...	66,962	16,062	6,129	525	650	500	337	275	91,440	57,500	2	3	5	8	1	4	5	--	--	--	--	--	--	
Nevada...	--	--	--	--	--	--	--	--	3,200	--	--	--	1	--	--	--	27	16	44	682	345,900	8	--	
Plumas...	--	--	--	--	--	--	--	--	--	--	--	--	1	2	--	--	11	6	--	--	--	--	--	
Sacramento...	27,102	15,405	4,173	1,993	5,927	886	836	518	56,844	33,180	7	--	7	21	2	--	2	4	59	308,000	10	7		
San Bernardino...	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
San Diego...	--	--	--	--	--	--	--	--	--	--	--	--	1	--	--	--	--	--	--	--	--	--	1	
San Joaquin...	3,000	1,000	300	--	--	--	--	--	4,300	--	--	--	7	21	--	--	3	--	--	--	--	--	--	
San Luis Obispo...	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Santa Clara...	--	--	1,500	--	--	--	--	--	13,500	30,000	2	5	7	17	--	--	10	--	--	--	--	--	--	
Santa Cruz...	300	3,000	351	--	--	--	--	--	3,851	7,000	--	--	4	--	3	8	11	--	--	--	--	--	--	
Shasta...	3,247	1,876	266	55	63	84	1,062	36	6,718	5,447	2	--	2	6	--	--	12	2	--	--	--	--	--	
Sierra...	300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	25	1	78	389,000	2	--		
Siskiyou...	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	--	200,000	1	5		
Solano...	7,039	1,087	756	--	--	560	147	224	9,813	56,173	3	--	3	--	--	--	--	--	--	--	--	--	--	
Sonoma ⁹ ...	--	--	--	--	--	--	--	--	6,730	24,800	1	5	6	--	--	--	8	--	--	--	--	--	--	
Stanislaus...	--	--	--	--	--	--	--	--	837	449	--	--	1	1	--	--	1	--	--	--	--	--	15	
Sutter...	--	--	--	--	--	--	--	--	2,791	--	--	--	--	--	--	--	15	--	--	--	--	3	13	
Trinity...	762	1,264	465	100	200	--	--	--	--	--	--	--	1	--	--	--	--	--	247	--	--	--	--	
Tulare...	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Yolo...	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Yuba...	--	--	--	--	--	--	--	--	8,200	17,000	5	1	6	12	--	--	22	18	--	117,400	--	7	8	

⁹ Mendocino included.

5. RECAPITULATION.

Agricultural Products, Live Stock, Improvements, Etc.	Total.	No. of Counties.	Agricultural Products, Live Stock, Improvements, Etc.	Total.	No. of Counties.
Acres, cultivated	257,630	16	Swine, No.	192,589	26
Wheat, acres	132,367	22	Goats, "	4,253	17
" bushels	2,332,603	22	Peach Trees, No.	157,958	12
Barley, acres	85,593	21	Apple " "	91,896	10
" bushels	3,026,807	21	Pear " "	18,754	10
Oats, acres	29,375	21	Cherry " "	7,429	6
" bushels	913,500	16	Plum " "	10,590	6
Corn, acres	4,317	17	Apricot " "	4,045	6
" bushels	143,326	13	Quince " "	4,135	6
Potatoes, acres	9,659	12	Fig " "	1,205	6
" bushels	484,376	10	Total Fruit Trees	330,312	17
Vegetables, acres	6,181	10	Grape Vines, No.	294,759	12
Hay, acres	13,083	7	Flour Mills, steam	25	9
" tons	42,499	15	" water	21	9
Wool, lbs.	106,615	6	" total	65	20
Butter, "	261,016	7	" run of stone ...	110	12
Cheese, "	209,477	6	Saw Mills, steam	47	7
Horses, No.	78,707	28	" water	44	5
Mules, "	13,937	22	" total	246	19
Asses, "	861	14	Quartz Mills	49	8
Oxen, "	15,072	13	Mining Ditches	224	8
Cows, "	38,760	15	" miles	2,168	6
Calves, "	17,613	10	" value	\$2,185,300	7
Total Cattle	429,243	28	Bridges, No.	57	10
Sheep, No.	123,094	25	Ferries, "	59	7

The Wheat crop for 1855, may be estimated as follows:

	Counties	Bushels.
As per Table	22	2,332,603
" " 3,202 acres, 20 bushels per acre ...	5	264,040
As per margin	5	172,000
Totals	32	2,768,643

6. STATISTICAL NOTES.

ALAMEDA COUNTY.

Acres of Wheat rusted and not harvested, 1,938. Strawberries, 27 acres; yield 40,500 lbs. Apple Orchards, 229 acres. Peach Orchards, 72 acres, Vineyards, 34 acres. Nurseries, 91 acres. Peaches, 6,000 lbs. Miles of hedge, 2 $\frac{3}{4}$. Ornamental Trees, 30,000. Number of Poultry, 18,764. Dozens of Eggs, 81,782. Flour Mills, 3; make 500 bbls. per day. Several Artesian Wells, from 250 to 350 feet deep.

AMADOR COUNTY.

Acres of Land claimed, 34,333. Saw Mills, 15; cost \$100,000; make 9,850,000 feet lumber per annum; value of lumber, \$295,500; expenses, \$197,000; profit, \$98,500. Flour Mills, 2; cost \$14,000; make 666,000 lbs. per annum; receipts, \$6,660; expenses, \$4,995; profit, \$1,665. Quartz Mills, 6; crush 18,000 tons quartz per annum, with 50 stamps; receipts, \$270,000; expenses, \$133,000; profit, \$137,000. Miles of Telegraph, 25.

BUTTE COUNTY.

Corn destroyed by grasshoppers. Suspension Bridge, 250 feet span; capital stock, \$39,000.

COLUSI COUNTY.

Area 1,792,000 acres; Mountain Land, 856,000 acres; Valley Land, 936,000 acres; Spanish Claims, 241,845 acres; fit for cultivation, 600,000 acres; grazing, 1,000,000 acres. Flour Mills, 2; cost, \$30,000; grind 25,000 bushels grain and make 5,200 bbls. flour per month. Value of Poultry, \$4,500.

CONTRA COSTA COUNTY.

(Surveyor's Report for 1854, omitted in former Report.) Tillable Lands, 150,000 acres; Overflowed lands, 150,000 acres. Horses, 16,000. Cattle, 25,000. Sheep, 95,000. Swine, 9,000. Wheat, 200,000 bushels. Potatoes, 50,000 bushels. Tons of Grapes, 75.

EL DORADO COUNTY.

Acres inclosed for agricultural and grazing purposes, 8,000. Value of animals slaughtered, \$600,000. Tons of Quartz crushed per day, 50, yielding \$20 to \$80 per ton. Miles of Telegraph, 75. Value of Poultry, \$5,000. Fine Marble found in county.

LOS ANGELES COUNTY.

Beans, 8,654 quintals or cwt. Sweet Potatoes, 450 do. Salt, 1,000,000 lbs. Artesian Well, 570 feet; cost \$3,000.

MARIN COUNTY.

Area, 700 square miles; two-thirds suitable for cultivation and grazing. Acres of Wheat entirely destroyed by rust, 2,028. Barley and Oat crop light. Potatoes, 39 sacks to the acre. Acres white Beans, 180. Taxable property, \$833,679.

NAPA COUNTY.

Rye, 120 acres. Buckwheat, 20 acres. Occupied by Gardens, Vineyards and Orchards, 675 acres. Whole number acres assessed, 250,347. Grapevines yield 3 lbs. each. Subsoiling recommended. "Clubhead" wheat condemned. Value of poultry, \$14,000. Value of Eggs, \$13,124.

NEVADA COUNTY.

Land claimed and surveyed, 30,000 acres. Toll-Bridges, 8; assessed value, \$26,300. Quartz Mills, 16; value \$300,000; tons crushed per year, 75,000; value per ton, \$25; expense per ton, \$15; probable value of Quartz Mines, \$2,000,000. Saw Mills, 27; butting 2,000,000 feet per month; worth \$20 to \$35 per M. Flour Mill, 1; capital, \$25,000; flour ground per annum, 5,000 bbls.; tons of barley ground per month, 20; value of flour, \$60,000. Probable yield of Mines, \$5,000,000 per annum.

PLACER COUNTY.

Ranchos, 143; assessed value of improvements and stock, \$219,000. Assessed value of taxable property in county \$1,700,000. Saw Mills, 20; value, \$86,000. Toll Roads and Bridges, 9; value, \$71,000. Mining capital, \$100,000, assessed on productive claims. Mining Ditches, 29; value, \$375,000. Quartz Mills, 2.

PLUMAS COUNTY.

Lands claimed, 14,604 acres; Swamp Lands, 4,000 to 5,000 acres.

SACRAMENTO COUNTY.

Flour mills, 7; value, \$66,000; 630 bbls. flour per day. Saw Mills, 2; value; \$35,000; 2,500,000 feet lumber per annum. Iron Foundries, 2. Distilleries, 1; value, \$8,500; makes 120 bushels grain into 360 gallons of whiskey per day; value of whiskey per annum, \$89,856. Bridges, 10; aggregate length, 4,000 feet; cost \$307,800; annual income, \$39,000. Ferries, 7; cost \$3,800; annual income, \$9,200. Mining Ditch Companies, 4; aggregate income, \$188,000. Poultry, No. 19,496.

SAN BERNARDINO COUNTY.

Grapes, 202,500 lbs. Peaches, 650 bushels. Pears, 200 bushels. Onions, 1,000 bushels. Beans, 500 bushels.

SAN JOAQUIN COUNTY.

Acres under fence and improved, 61,788. Public Schools, 15. Grapes, 12 acres. Club West recommended.

SAN LUIS OBISPO COUNTY.

Agricultural Land, 30,000 acres. Grazing Land, 250,000. Fruit Trees, 25 acres. Beans, 2,500 bushels. Value of animals slaughtered, \$15,000.

SANTA CLARA COUNTY.

Acres under fence, 50,000. Onions, 2,500 bushels. Rye, 75 acres, 1,875 bushels. Buckwheat, 20 acres, 400 bushels. Beans, 200 acres, nearly destroyed by drought. Flour Mills, 7; grind 500 bbls. per day. New Alameda Quicksilver Mine yields annually 22,000 bottles, at 75 lbs. per bottle. Artesian Wells, 63; many discharge 500 gallons per minute; one well, 6 inches diameter, 209 feet deep, cost \$600; discharges 1,000 gallons per minute. Miles Telegraph, 30; cost \$40,000. "Santa Clara College," founded 1851; building and grounds cost \$50,000; library, 10,000 volumes; students, 111. "University of the Pacific," founded in 1851; building and grounds cost \$30,000; male pupils, 134; female pupils, 109. "Young Ladies Seminary," founded 1851; building and grounds cost \$75,000; pupils, 130; Girls' Free School attached, 53 pupils. Total number of public and private Schools, Colleges, etc., 25; aggregate number of scholars, 1,218.

SANTA CRUZ COUNTY.

Agricultural Land, 180 square miles; Grazing, 150 square miles; Timber and Mineral Land, 250 square miles. Acres of Wheat, 2,500, and acres of Oats, 700, spoiled by rust and smut and not harvested. Acres of Beans, 250, at 40 bushels per acre. Acres of buckwheat, 50, at 30 bushels per acre. Acres of Onions, 45. Acres of Cabbage, 8. Acres of Peas, 6. Gardens, 50 acres. Barrels of Lime burned and shipped, 30,609. Flour Mills, 4; make 60 bbls. per day, each. Saw Mills, 11; make 1,200 feet per day, each. Taxable Property, \$1,000,000. Eggs, dozen, 60,000.

SHASTA COUNTY.

Cotton, half acre; yield 200 lbs. Saw Mills, 12; cost, \$58,000; expense per day, \$226; make 24,000 feet lumber per day, at \$45 per M. Flour Mills, 2; 100 horse power engine; cost \$85,000; expense, \$7,000 per month; make 2,044 bbls. per month. Quartz Mills, 2; cost \$40,000; one in operation crushes 180 tons per month; expenses, \$1,680, and yield per month, \$5,400. Artesian Well 93 ½ feet deep. Value of Animals slaughtered, \$97,000. Value of Poultry, \$5,680.

SIERRA COUNTY.

Saw Mills, 25; value \$93,000. Quartz Mill, value, 8,000. Mining Ditches in progress, 50; probable cost, \$1,500,000. Bees slaughtered, from 1,500 to 2,000. Taxable property, \$1,484,560.

SISKIYOU COUNTY.

Area, 100,000 acres; Swamp and Overflowed, 25,000; claimed, 35,000; under fence, 20,000. Fruit Trees, 500 acres.

SOLANO COUNTY.

Area, 900 square miles; subject to overflow, 110,000 acres; mountain land, 155,000 acres; valley land, 310,000 acres; fit for cultivation, 175,000 acres; grazing, 135,000 acres. Broom Corn, 150 acres. Onions, 50 acres, 500 tons. Olive Trees, 1,000. Locust Trees, 2,000. Value of Animals slaughtered, \$100,000. Artesian Wells, 2.

SONOMA AND MENDOCINO COUNTIES.

Inclosed Land, 37,052 acres. Club Head Wheat, destroyed by rust, and not harvested, 8,733 acres. Buckwheat, 99 acres; 2,778 bushels. Peas, 156 acres; 4,680 bushels. Beans, 177 acres; 2,124 bushes. Potatoes, 1,693 acres; 67,720 sacks. Grapes, 50 tons. Saw Mills, 8; 110,000 feet of lumber per day. Steam Flour Mill, 2 run of stones; cost \$6,500; 75 bbls. of flour per day.

STANISLAUS COUNTY.

Met at work in Mines, 250; gold per annum, \$225,000.

SUTTER COUNTY.

Area, 400,000 acres; two-fifths swamp and overflowed. Cabbages, 1,000,000 lbs. Onions, 28,195 lbs.

TRINITY COUNTY.

Acres fit for cultivation, 10,755 acres; claimed, 24,849 acres; swamp and overflowed, 255 acres; grazing, 104,827 acres. Beeves slaughtered per annum, 3,000. Ferries, 13; cost \$7,300; income, \$3,950. Bridge, cost \$7,000; income, \$4,000. Saw Mills, 15; cost \$63,074; 2,695,000 feet lumber per annum; expenses, \$90,000; value of lumber, \$188,650. Gold Dust bought per annum, 78,000 ounces.

TULARE COUNTY.

Agricultural land, 1,600 square miles. Taxable property, \$438,000.

YOLO COUNTY.

Area, 370,000 acres; arable land, 130,000 acres; unproductive lands, 20,000 acres; Tule lands, 80,000; mountainous and grazing, 120,000 acres; land inclosed, 60,000 acres. Poultry, 14,000; value, \$10,000. Eggs, 200,000 dozen.

YUBA COUNTY.

Area, 552,000 acres; fit for cultivation, 280,000 acres; grazing, 80,000 acres; mineral land, 174,960 acres; Steam Saw Mills, 6; value, \$19,500; Saw Mills (water power,) 16; value, \$38,600; lumber per annum, 3,875,000 feet; cost per M., \$15; value per M., \$25. Steam Flour Mills, 5; value, \$44,000; bushels ground per year, 95,862. Turnpike Companies, 2; length, 71 miles; cost \$35,000.

STATISTICS FROM OTHER SOURCES.

SAN JOAQUIN COUNTY FLOURING MILLS.

Paige & Webster's, Stockton; fire-proof brick building; cost nearly \$100,000; capacity, 200 bbls. in twenty-four hours.

Sperry & Baldwin's, Stockton; in operation five years; capacity, 100 bbls. flour and ten tons barley in twenty-four hours; fire-proof warehouse, 40 by 80 feet, attached; can store 600 tons grain and flour.

Sargent, Stagg & Lane's Avenue Mills, Stockton; in operation two years.

Hodges & Terry's, on Mokelumne River, about eighteen miles from Stockton; capacity, 50 bbls. per day.

Doake's, near Fifteen Mil House, on Mokelumne Hill Road; built within the past year.

The Stanislaus Mills, at Knight's Ferry, about forty miles from Stockton, on west bank of Stanislaus River; dam 300 feet, and fifteen feet high; only water-power mill in county.

Total, six mills; capacity, 600 bbls. flour per day. – *Stockton Argus*.

CALAVERAS COUNTY.

Saw Mills, 14; 9 steam and 5 water; aggregate horse power, 202; utmost capacity, 1,065,000 feet lumber in 24 hours. Bridges, 10; one wire suspension, 3 truss and 6 beam; aggregate value, \$96,000. Ferries, 8; aggregate value, \$70,000. Mining Canals, 21; length, 328 miles; estimated value, \$1,016,500; other short ditches, 40 miles; value, \$14,000; aggregate length, 368 miles; aggregate value, \$1,030,500. – *From Report of Wm. Patton, Civil Engineer*.

TUOLUMNE COUNTY – MINING CANALS.

Tuolumne County Water Company's Ditch; assessed value, \$275,000; main trunk from South Fork of Stanislaus River to Columbia; entire length of main ditch and branches, about fifty miles.

Tuolumne Hydraulic Ditch, from Tuolumne River to Sonora; entire length including branches, near sixty miles; original cost, \$300,000; assessed value, \$30,000.

Street's Ditch, or Sullivan's Creek and Shaw's Flat Water Company; original cost; \$75,000; additional cost when extended to Main Fork of Tuolumne River, \$100,000; Entire length, fifty to sixty miles; twenty miles through a mining region.

Columbia and Stanislaus River Water Company – Capital stock, 1,500 shares of \$2,000; total, \$300,000; nearly completed to South Fork of Stanislaus, to be extended to

the Main Fork; \$80,000 already expended; when completed, the length of the main branch will be over fifty miles.

Jamestown and Chinese Ditch, from Wood's Creek to Chinese Camp – Capital stock, \$22,000; length, about seven miles, nearly completed.

Chili Camp Ditch – Value, \$3,000; length, four miles.

Seco Ditch – Value, \$3,000; length, three miles.

Pine Ditch – Value, \$2,000; length, five miles.

Yorktown (Brunton's,) Ditch – Value, \$6,000; length, five miles.

Republican Ditch – Value, \$3,000; length, four miles.

Jamestown Ditch – Value, \$1,000; length, two miles.

Wood's Digging's Ditch – Value, \$8,000; length, 10 miles.

Aggregate length of Canals in the County, 255 miles, of which thirty-five miles are not completed; original cost, about \$1,800,000; cost when complete, \$2,000. – *Sonora Herald*.

OTHER MINING CANALS.

Bear River and Auburn Mining Canal – Projected in 1851; capital stock, \$650,000; seventy-three miles of main, and as many more of distributing Canals; capacity, twelve cubic feet per lineal foot; cost, \$560,000 per month for repairs, and one per cent per month more than one-half of the sum expended in its construction.

South Fork Canal - \$400,000 expended, and Canal sold; yields twenty-five per cent. per month on the purchase; can supply 7,000,000 cubic feet of water per day.

At Coloma, six Mining Ditches, averaging ten per cent. per month on investment, and furnishing employment for 2,000 men, who pay four dollars per day for water.

Natoma Canal – Water from the South Fork of the American River; projected in 1852; capacity, sixteen cubic feet per lineal foot; current, three miles the hour; supply 6,000,000 cubic feet per day; cost of forty miles of main trunk, and as many of branches, \$150,000; paid for in one year; now clear of all incumbrance, and paying \$2,000 per week.

North Fork Canal – Capacity, fourteen cubic feet per lineal foot; current, two and a half miles the hour; owned and managed by the former Company, with similar results. – *From the Report of W. S. Watson, C. E.*

CONTEMPLATED CANALS.

Truckee Lake Canal – Capital, \$10,000,000; water from Truckee Lake, through the dividing ridge of the Sierra, by tunnel several miles in length, to be distributed on the ridges of the heads of the Yuba; capacity, nearly 100 cubic feet per lineal foot.

South Yuba Canal – Will probably be completed in July, 1856, through the ridge dividing the waters of Yuba and Bear Rivers, by tunnel two-thirds of a mile in length; tunnel estimated at \$40,000; capacity, twenty-five cubic feet per lineal foot, with a current of four miles the hour.

Placer County Canal Company – Capital, \$300,000, to bring water from the North Fork of the American River, at Grand Falls, down the divide of North Fork and Bear River; entire length, with branches to Illinoistown, about forty miles, supplying a mining region forty by seven miles; capacity, twenty-four cubic feet per lineal foot; grade, ten

feet per mile; current, six miles the hour; will discharge 15,000,000 cubic feet of water, equal to 6,000 inches, per day; whole length of main trunk, eighteen and a half miles, under contract for \$150,000; to be completed by September, 1856; anticipated revenue, \$2,500 per day. – *From Report of W. S. Watson, C. E.*

VIII. APPROPRIATIONS RECOMMENDED.

For Explorations and Surveys of Immigrant Wagon Roads	\$ 15,000
For Construction of " " "	150,000
For Selection of School Lands	5,000
For Securing Swamp and Overflowed Lands	12,000
For Survey of County Boundaries	10,000
For Goddard's Topographical Map (cash)	2,000
For Meteorological Instruments	4,000
For Contingencies	2,000
Total	<u>\$200,000</u>

IX. CONCLUSION.

The salary of this office during the last two years has been but \$2,000 per annum, in scrip, equal to about \$1,400, less than half the pay of members of the Legislature, and considerably less than the pay of Pages in the Senate and Assembly, and not sufficient for the personal expenses of the incumbent. No fees are attached to the office, and not have been received during that time. For the two previous terms the salary was \$7,500. The present salary is far less than civil engineers may command for their services in the exercise of their profession in this State.

Until quite recently, the salary of the Chief Engineer of the Sacramento Valley Railroad has been \$8,000, and the Surveyor-General has never been able to employ an engineer to assist him for anything like the amount he has received for his own services. Inasmuch as he believes that he has been a faithful and laborious public servant, and that his services are worth more than he has received for them, he respectfully asks that he may be allowed extra compensation; and as he believes that \$6,000, in addition to his salary for the last two years, would not be an unreasonably large sum, he respectfully asks the same.

I take great pleasure in expressing the opinion that I have been particularly fortunate in my selection of assistants during the past year. Had I the same duties to perform again, my first endeavor would be to obtain as assistants, Messrs. Day, Goddard and De Witt.

All of the foregoing is respectfully submitted.

S. H. MARLETTE,
Surveyor-General.

NOTE – This is the earliest moment at which I have been able to transmit my Report. A statement of the expenditures of this office and required appropriations to meet deficiencies was transmitted some time since, one copy to the Speaker of the Assembly, and another to the Chairman of the Senate Finance Committee, and may be found substantially in Appendix A, No. 1. Mr. Still's account for surveying a part of the Sierra County boundary, may be found in his Report in Appendix C. His map I transmit to the Senate, also a map of the State Prison Grounds, and a diagram illustrating Mr. W. Patton's contribution, and a map illustrating Mr. Chapman's communication. Also, a map of the Calaveras Wagon Road Route. Mr. Goddard's maps and profiles will be transmitted in a few days. To both Senate and Assembly I transmit a copy of the map, showing what U. S. Township plats have been received, and what copied and sent to the County Surveyors. S. H. M.

Sacramento, Feb. 16, 1856.

APPENDIX
TO
SURVEYOR-GENERAL'S REPORT.

APPENDIX.

APPENDIX A.

1. EXPENDITURES AND DEFICIENCIES IN SURVEYOR-GENERAL'S OFFICE.

Annexed may be found in Exhibit A, a statement of the expenditures of the Surveyor-General's Office (during my term,) since February 1, 1855, including the expenditures necessarily incurred by me for the State, since the expiration of my term of office, up to the 7th of February, 1856.

EXPENDITURES.

Cash, \$7,830 78; Scrip, \$7,831 43; - equal to about \$13,700 is cash, or \$18,000 in scrip.

Exhibit B shows the *deficiencies*, and to whom due.

DEFICIENCIES.

Due in cash, \$6,977 30; due in scrip, \$6,915 20; - equal to about \$12,000 in cash or \$16,000 in scrip.

NOTE – The above statement of *expenditures* and *deficiencies* includes about \$2,000 (in scrip) for advertising; about \$1,500 of which is for advertising an abstract of the Act for the sale of the swamp and overflowed lands, and the instructions for the survey of the same, in the *Times and Transcript* (20 insertions), in the *Sacramento Union* (15), in the *San Joaquin Republican* (12), and in the *California Express* (6). The claim is not strictly legal, but it is equitable, and I recommend that it be paid. The above named papers inserted the advertisement at my request, relying upon the justice of the Legislature for compensation. If the Act was worth passing, it was worth being made public – particularly the portions published.

Exhibit C shows for what purposes the contingent fund has been expended.

Exhibit D shows the amount due me for cash expenditures for the State, beyond the appropriations, as equal to \$855 35, to which I have added \$400, for services since the expiration of my term of office. Total, \$1,255 35 cash.

Exhibit E consists of certified accounts of Jesse Hackett, George H. Goddard, Thomas Tennent, the United States Surveyor-General and Ferris Foreman, *all for cash*; it having been understood that they were to be paid in cash or its equivalent. Total, \$5,722 30 cash.

It also contains certified accounts of Sherman Day, James Langley, Wm. L. De Witt, Nevett & Co., A. Koneman, James Allen and Edwin Billings, *all for scrip*; it having been understood that they were to be paid with the same. Total, \$3,992 scrip.

It contains also Milton Ferrell's account for \$120, of which I have recommended \$100 be paid,

Exhibit F consists of Silas Wilcox's account for the survey of the boundary line between the counties of Stanislaus and Tuolumne, ordered by the last Legislature, for \$481.

I am of the opinion that Mr. W. is entitled to charge eight (most certainly six) dollars, instead of four per mile. I would, therefore, recommend that his bill be paid as made out by him.

Exhibit G consists of C. D. Semple's account for survey of boundary line between Colusi and Yolo Counties, authorized by me under the Act concerning the office of the Surveyor-General, for \$342 20.

His account should have been certified to by the Board of Supervisors and County Judge, yet, as the work has undoubtedly been done, I recommend that he be paid.

My approximate estimate, scrip \$24,000 of Dec. 15, contained \$7,000 for county boundary surveys, whereas this statement includes less than \$1,000. Returns for the balance have been, or probably will be, received by my successor.

EXHIBIT A.

EXPENDITURES OF SURVEYOR-GENERAL'S OFFICE.

WAGON ROAD.

	Scrip.	Cash.
For reconnaissance of routes, including Eastern Boundary Survey	\$1,537 20	\$2,781 91
For survey of Wagon Road	1,456 00	255 17

Equal to about \$5,300 cash, of which about \$1,000 was expended in purchasing instruments.

STATE LANDS.

For U. S. township plats.		3,200 00
For copying "		367 50
" " and swamp land returns	1,230 00	
Advertising and printing, about	2,000 00	

Equal to about \$5,600 cash.

County Boundary Surveys	833 20	
State Prison Ground Survey and Map	112 00	
Office Rent	426 00	85 00
Contingent Express	246 70	771 20

Equal to about \$900 in cash.

For my own services since the expiration of my term of office, I have reported		400 00
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Totals	<u>\$7,831 43</u>	<u>\$7,830 78</u>
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Equal in cash to about	\$13,700 00	
" scrip "	18,000 00	

EXHIBIT B.

DEFICIENCIES OF SURVEYOR-GENERAL'S OFFICE.

CASH.

Due	S. H. Marlette	\$1,255 00
	Jesse Hackett.	237 00
	George H. Goddard	1,882 25
	Thos. Tennent	259 00
	U. S. Surveyor General	3,200 00
	F. Foreman	144 05
	Total deficiency to be paid in cash	<hr/> 6,977 30

SCRIP.

Due	Sherman Day	2,600 75
	James Langley	714 00
	William L. De Witt	516 00
	Nevett & Co.	59 25
	A. Koneman	71 00
	James Allen	17 00
	Edwin Billings	14 00
	Milton Ferrel	100 00
	Silas Wilcox	481 00
	C. D. Semple	342 20
	Total deficiency to be paid in scrip	<hr/> \$4,915 20

NOTE – To the above should be added for certified accounts for advertising and printing, about \$2,000 in scrip, if not otherwise provided for.

Total deficiency, including \$2,000 scrip, for advertising, equal in cash to about \$12,000.

Equal in scrip to about \$16,000.

EXHIBIT C.

State of California in account with Surveyor-General's Office.

1855. CR.
By appropriation for contingent expenses... \$2,000 00

DR.

April 17.	To W. G. Chambers, for portorage	\$26 50	
30.	To expenditures of Surveyor-General on trip to San Francisco to consult U. S. Surveyor-General about Map	41 25	
	To D. W. Ap. Jones, for Monk's Map of U. S.	25 00	
	To James Gudgeon, for wool	6 25	
May 1.	To Chas. Binney, for stationary	36 00	
4.	To James Anthony, for <i>Sacramento Union</i> ..	12 00	
17.	To A. Koneman, for candles and matches ..	17 87	
25.	To J. W. B. Barclay, for horse	301 20	
June 6.	To A. B. Youmans, for rent for June	83 33	
11.	To H. Rivett, for awning	55 83	
16.	To Rivett & Co., for matting, and for moving office fixtures.....	26 00	
			\$631 23
	Balance		\$1,368 77

The above was drawn July 2, and sold at 75 per cent., realizing	\$1,026 58	
Add amount realized June 2, from sale of warrant for \$34 91, at 60 per cent., from Quartermaster-General, for stove, etc.....	20 95	1,047 53

May 25.	To cash paid Williams, for bringing horse, and for keeping same, etc.	8 00
	To balance on horse to J. W. B. Barclay, to meet loss on scrip	39 16
	To cash paid Roth, for saddle, bridle, etc....	55 00
	" " for whip, and mending bridle	2 00
June 26.	To table, hone, matting and oil cloth	17 25
July 2.	To cash to George H. Goddard	18 50
	" A. B. Youmans, for rent	50 00
	" " for shelves	10 00

	“	Chas. Binney, stationery	37 90
3.	“	George H. Goddard	50 00
7.	“	“	11 50
	“	Pacific Express Co.	20 00
10.	“	Charles Pace, Altitude and Azimuth Instruments	600 00
	“	Gillig & Co., for sprinkler	1 25
12.	“	Smith & Barclay, horse-keeping and shoeing	47 50
13.	“	F. Foreman, postage and box rent	42 00
15.	“	for blankets, saddle-bags, etc., for Carson Valley expedition	19 00
16 to 26.	“	expenditures on Carson Valley expedition.....	12 00
July 28.	“	Carr & Winans, pedestal in Observatory	25 00
			<u>\$1,066 06</u>
		Deduct credit as above	<u>1,047 53</u>
		Excess of expenditures, July 28	\$18 53

EXHIBIT D.

State of California to S. H. Marlette,

1855.

DR.

July 28.	To cash expended beyond appropriation, as above.....	\$18 53
Aug. 1.	" paid George H. Goddard	7 50
2.	" " for tent for Mr. Goddard's expedition	12 00
	" " rope and wool for " "	2 25
	" " oiled silk case for altitude and azimuth instrument	9 00
	" " Stage Co., and others, for freight on saddle and sundries	2 50
3.	" " Geo. H. Goddard	30 00
4.	To note given to Wm. Schmolz for barometer	55 00
6.	To cash paid Geo. W. Ricker & Co., for observatory, drafting desk and stand for altitude and azimuth instrument	100 00
13.	" Geo. O. Whitney for desk stool	2 50
14.	" A. B. Youmans for office rent	50 00
15.	" Sherman Day	50 00
21.	" expenditures on trip to Placerville	8 00
Sept. 7.	" J. W. B. Barclay, horse keeping, shoeing, etc.....	62 50
12.	" C. Binney, stationery	25 00
14.	" for repairing theodolite	1 00
	" Sherman Day	20 00
20.	" " " 	80 00
24.	" " " 	19 00
25.	" " " 	30 00
	" to Michiner for tent, duck and drill	23 22
Oct. 1.	" Sherman Day	10 00
	" Mr. Schmolz for leveling rod	20 00
2.	" Geo. W. Hancock (for assisting Mr. Day)	21 00
	" Seth Dustin " "	21 00
3.	" Fare, etc., of Mr. Goddard and self from Placerville.....	5 75
4.	" For telegraph charges, etc.	3 80
13.	" Geo. H. Goddard	20 00
17.	" Wines & Co.'s Express charges on Map	50
19.	" Eye-glass, keel and pencils, etc., for Mr. Day.....	2 30
31.	" Geo. H. Goddard	60 00
Nov. 1.	" J. W. B. Barclay, horse keeping, shoeing, etc.....	60 00

Oct. 31	To cash paid expenditures on trip to Calaveras, on wagon		
to Nov. 9.	road business		40 00
Nov. 14.	“ J. Gudgeon for wood		4 50
15.	“ Geo. H. Goddard		20 00
Dec. 1.	“ Mr. Murray, rent of office for December		20 00
	“ J. W. B. Barclay, horse keeping and		
4.	medicine for horse		21 00
5.	“ Geo. H. Goddard		50 00
	“ Jesse Hackett, portorage		25 00
9.	“ J. Gudgeon for wood		9 00
28.	“ “ “		4 50
	“ Geo. H. Goddard		50 00
1856.			
Jan. 1.	“ “ “		100 00
4.	“ J. Gudgeon for wood		4 50
7.	“ Mr. Murray for office rent		15 00
	“ D. Woods, and Womser Brother, interest on		
	money used for State during last year		13 00
	Add interest to be paid to David Woods, March 1 st , 1856,		
	on notes for \$380 used for State		81 00
			<u>\$1,319 85</u>

CR.

Aug. 14.	By cash realized from sale of warrant for		
	\$133 33, at 75 per cent, from rent fund		
	for office for July and August	\$100 00	
17.	By cash realized from sale of warrant for		
	\$83 33 at 72 per cent, transferred from		
	rent fund for office rent for June	60 00	
Dec. 5.	By each received of Wm. Higby, for horse,		
	saddle, bridle, etc., belonging to the		
	State, sold early in November	335 00	495 00
			<u>495 00</u>
	Balance due S. H. Marlette, in cash, Jan. 7 th , 1856		\$824 85

I certify the above bill to be correct.

S. H. MARLETTE,
Surveyor-General.

State of California to S. H. Marlette,

1856.

DR.

Jan. 7.	To cash expended for State in Surveyor-General's office, as above	\$824 85
9.	To cash paid for cartage in moving part of office fixtures, etc.....	6 00
20.	To cash paid to J. Gudgeon for wood	4 50
26.	To cash paid J. Morrill for office rent, from Jan. 9 th to Feb. 9 th , 1856	<u>20 00</u>
	Total cash expenditures for State to Jan 26.	\$855 35
	Add for one month's services since expiration of term of office, (from Jan. 7 to Feb. 7,) say	<u>400 00</u>
	Total	\$1,255 00

I certify the above bill to be correct.

S. H. MARLETTE,
Surveyor-General.

Sacramento, Feb. 6, 1856.

EXHIBIT E.

State of California to Jesse Hackett,

DR.

To portorage from the middle of May, 1855, to 7 th of Jan., 1856, at \$30 per month.....	\$232 00
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CR.

By Cash from S. H. Marlette, Dec. 5, 1855	<u>25 00</u>
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Balance due J. H. in cash, Jan. 7 th , 1856	\$207 00
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I certify the above bill to be correct.

S. H. MARLETTE,
Surveyor-General.

Add for services from Jan. 7 th to Feb. 7 th	<u>30</u>
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\$207 00

I certify the last charge to be correct.

S. H. MARLETTE.

Sacramento, Feb. 7, 1856.

State of California to Geo. H. Goddard,

1855.

DR.

Aug. 1. To salary in Surveyor-General's office, from June 26 th to Aug. 1, at \$250 per month, (cash)	\$291 00
To cash expenditure at sundry times	76 50
Oct. 1. To salary on Wagon Road Exploration and Boundary Survey, two months at \$300 per month, (cash)	600 00
To cash expenditure at sundry times	62 25

1856.

Jan'y. 7. To salary in Surveyor-General's office from 1 st of October to Jan. 7 th , at \$300, (cash)	<u>970 00</u>
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Total	\$1,999 75
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CR.

By cash received of S. H. Marlette, at sundry times 417 50

Balance due Mr. Goddard in cash, January 7, 1856 \$1,582 25

I certify the above bill to be correct.

S. H. MARLETTE,
Surveyor-General.

Add one month's salary from January 7 to February 7, at same price... 300 00

Total in cash..... \$1,882 25

S. H. MARLETTE.

Sacramento, Feb. 6, 1856.

State of California to Thomas Tennent,

1855.

DR.

From July 9th to Nov. 12th. To repairing altitude and azimuth instrument and theodolite; also to barometer, thermometer, chains, etc., and hire of chronometers, as per bill, in cash..... \$259 00

I certify the above bill to be correct.

S. H. MARLETTE,
Surveyor-General.

Sacramento, January 7th, 1856.

State of California to United States' Surveyor-General,

DR.

To furnishing the State Surveyor-General's Office with 300 township plats, at sundry times, cost \$8 00 each – (an account for the above was certified to, and rejected by the Controller Oct. 9th, on the ground that there was no appropriation to meet it)..... \$2,400 00
Jan 7. To furnishing 100 township plats, at sundry times, at \$8 00..... 800 00

Total..... \$3,200 00

The above should be paid in cash.

I certify the above bill to be correct.

S. H. MARLETTE,
Surveyor-General.

The State of California to F. Forman,

DR.

To unsettled postage and box rent for last three quarters of 1855, for
which accounts have been certified to by the undersigned, (cash)... \$144 05

S. H. MARLETTE,
Surveyor-General.

Sacramento, January 7th, 1856.

State of California to Sherman Day,

1855.

DR.

To services and making map of State Prison and grounds, in June, 1855, seven days, at \$16 per day	\$112 00
To services in making reconnaissance of Immigrant Wagon Road routes, in June, July, August, September, seventy-one days, at \$16 per day	1,136 00
To expenditures on do	72 75
To services surveying Wagon Road in September, October, November, December and January, ninety-one days, at \$16 per Day	1,456 00
To expenditures on do	33 00
Total	<u>\$2,809 75</u>

CR.

By cash received of S. H. Marlette during reconnaissance	\$169 00	
By cash of do. during survey	<u>40 00</u>	
		<u>\$209 00</u>
Balance due Mr. Day, January 7, 1856		\$2,600 75

I certify the above bill to be correct.

S. H. MARLETTE,
Surveyor-General.

Sacramento, January 7, 1856.

State of California to James Langley,

1855. DR.

From July to Dec., for 102 days' service in Surveyor-General's Office,
copying maps, documents, etc., at \$7, (scrip,) \$714 00

I certify the above bill to be correct.

S. H. MARLETTE,
Surveyor-General.

Sacramento, December 27, 1855.

State of California to W. L. De Witt,

DR.

To services in Surveyor-General's Office, drafting, etc., from the 12th
of Nov., 1855, to the 7th of Jan., 1856, 43 days at \$12, (scrip,) \$516 00

I certify the above bill to be correct.

S. H. MARLETTE,
Surveyor-General.

State of California to Nevett & Co.

DR.

To stove and fixtures for Surveyor-General's Office, (in scrip) \$59 25

I certify the above bill to be correct.

S. H. MARLETTE,
Surveyor-General.

Sacramento, Jan. 7, 1856.

State of California to A. Koneman,

DR.

To candles, matches, rope, box of soap, etc., from June 2, 1855, to
January 2, 1856, (in scrip,)..... \$71 00

I certify the above bill to be correct.

S. H. MARLETTE,
Surveyor-General.

Sacramento, Jan. 7. 1856.

State of California to James Allen,

DR.

To *State Tribune* for Surveyor-General's office, from April 8, 1855, to
January 1, 1856 \$17

I certify the above bill to be correct.

S. H. MARLETTE,
Surveyor-General.

Sacramento, Jan. 7, 1856.

State of California to Edward Billings,

DR.

To *California Chronicle* for Surveyor-General's office, seven months,
in 1855 \$14 00

I certify the above bill to be correct.

S. H. MARLETTE,
Surveyor-General.

Sacramento, Jan. 7, 1856.

State of California to Milton Ferrel,

DR.

To services of self and two horses from Sept. 15th to 22nd, inclusive,
eight days at \$15, on Wagon Road and Boundary Survey \$120 00

The above services were rendered, and I would recommend that Mr. Ferrel be
allowed \$100 for the same.

S. H. MARLETTE,
Surveyor-General.

Sacramento, Jan. 7th, 1856.

EXHIBIT F.

STATE OF CALIFORNIA,
Stanislaus County, August 8, 1855.

State of California in account with Silas Wilcox,

DR.

To distance run in the survey of the County line between Stanislaus and Tuolumne counties –

27 miles, 151 feet	\$109 00
21 monuments erected on line	63 00
20 miles to place of beginning	10 00
3 maps of the line	9 00
Recording	2 00
Assistance on the line, 36 days	288 00
	<hr/>
	\$481 00

I hereby certify the above account to be correct.

Signed,

SILAS WILCOX,
County Surveyor.

We, the majority of the Board of Supervisors of Stanislaus County, have examined the foregoing account of S. Wilcox, Surveyor of this county, charged by him for running the county line between this and Tuolumne County, and believe it to be correct and the charges reasonable.

Witness our hands, this 8th August, A. D. 1855.

Signed,

DAVID B. GARDNER,
JNO. M. NEVISON.

I hereby certify that the above work has been performed to the best of my information and knowledge.

Signed,

H. W. WALLIS,
County Judge.

August 8th, 1855.

EXHIBIT G.

COLUSI, July 28th, 1855.

State of California to C. D. Semple,

DR.

For ascertaining and running the boundary line between the counties of Colusi and Yolo –

29 miles and 12 chains, at \$10 for first mile and \$8 for each subsequent mile	\$235 00
To hire of two chainmen and one workman, 4 days, at \$3 per day	36 00
To hire of wagon, team and driver, to break down tule, 2 days, at \$10 per day	20 00
Board of hands, at \$3 per day	42 00
Plat and Certificate	3 00
Recording	2 00
Traveling to place of beginning, 8 miles	4 00
	<hr/> \$342 00

Signed,

C.D. SEMPLE,
County Surveyor.

I hereby certify that the above account is just and true, and that the disbursements therein named were made.

Given under my hand, the date above,
Signed,

C. D. SEMPLE,
County Surveyor, Colusi County.

2. HON. SHERMAN DAY'S REPORT ON THE IMMIGRANT WAGON ROAD EXPLORATIONS.

Hon. S. H. Marlette, Surveyor-General:

Dear Sir:

At your request I have examined, at different times during the past three months, several routes across the Sierra Nevada, with a view to the construction and improvement of an Immigrant Wagon Road, under the Act passed by the last Legislature. These routes were examined merely by riding or walking over them, or near them, but without a regular survey, and without the use of instruments, except in a few cases, to obtain the bearings of prominent points, or to determine the grades at some of the more difficult places. As it became apparent at an early stage of the examinations, that the question of the boundary between this State and the Territory of Utah, might affect materially the question of the location of the Road, I have given some attention to that point, and have made some surveys to connect Placerville with the U. S. Land Surveys; and also to define the position of the more important mountain peaks, lakes and valleys, near the south end of Lake Bigler, the Carson Cañon and Red Lake, on the Old Immigrant Road. As the astronomical investigations relating to this subject, are in charge of another person, and yet incomplete, I will only remark here, that the facts obtained by my surveys, relating to the boundary, will tend greatly to elucidate the topography of the Road, and show more clearly the relative positions of the different routes. They also serve to assure us that the Carson Cañon, the most important point on the Road and common to all the routes explored, is entirely within the limits of this State.

Since this boundary survey has been undertaken on the part of the State, I am gratified to learn that a U. S. Deputy Surveyor is also occupied in running "a standard parallel" (L on W line) past Placerville, Leek Springs, Red Lake and Carson Cañon to the eastern boundary of the State. The two surveys with the astronomical observations, will serve to test each other, and will furnish accurate data for a correct topographical map of the region examined. On my return, lately, I met Mr. Jones, the U. S. Deputy Surveyor, and exchanged notes with him, by which our surveys can be connected.

Much more time has been spent on these examinations, than would otherwise have been, in consequence of the necessity of depending upon volunteer parties, fitted out by citizens of the towns interested in any particular route. None of the parties liked to be drawn off from their own favorite route to examine another, and as the parties were generally composed of persons who expected to be absent but a few days, I was obliged to be regulated by their arrangements, and to make five or six repeated trips back and forth to the mountains, where one or two would have sufficed, if the party had been fully at my disposal for all and any of the routes.

The first route examined was one leading from Georgetown to the point where the Middle Fork of the American River issues from the higher mountains, and thence, after crossing the main middle Fork, over the mountains by a smooth and low pass, descending through a valley to the western shore of Lake Bigler, about opposite the middle of the lake, we went out along the natural ridge between the waters of Silver

Creek and those emptying into the Middle Fork. The route along this ridge was generally very smooth, the grades easy, or when difficult, naturally susceptible of improvement at a cheap rate; excellent pasture was most abundant, and up to the point where we struck the high mountains, the route would need little more than to have the bushes and timber cut away, and a few side-hill grades, to make it ready for stage travel. But, unfortunately, at the end of the ridge we found no practicable pass through the mountains. It would be necessary to leave this ridge, cross a tributary of the Middle Fork, then a high granite ridge of the south side of the Middle Fork, then the main Middle Fork, and ascend on the north side of the next mountain spur to the excellent pass which we discovered. This pass is a flat meadow, draining westward, and scarce separated from two upland lakes draining Lake Bigler. The cañon descends by an easy grade, with good earthy surface for a road to Lake Bigler, except for about a quarter of a mile, where large granite boulders are encountered, but presenting no insuperable or very formidable obstacle. In the valley between the summit and Lake Bigler, several good grazing farms might be located.

Circumstances compelled our return from this point, and I did not examine the continuation of the route around the south-west shore of the lake, except so far as I was afterwards enabled to examine it at a distance from the opposite shore. The design at the time was to continue the road around the south shore of the lake, and connect with Carson Valley through the "Eagle Ranch Pass." Of this part of the route I shall have occasion to speak elsewhere. I think a glance at the map is sufficient to convince any one that although this route might ultimately be an available one for the people of Yankee Jims, and Auburn, and Nevada, to connect with a road through Carson Cañon, yet it would seem to be a very circuitous one for the people of Georgetown to take to get round the south shore of Lake Bigler.

The next route examined was one that had been recommended by Mr. Taylor, of Cold Springs, (on the old Immigrant Route above Placerville,) and was then under process of examination by Dr. Bradley, of Diamond Springs, and Mr. Graham, of Ringgold. As you were with us upon this route you are aware that, for a considerable distance on the upper part of the route, immediately below Red Lake and Silver Lake, we could not conveniently travel over the ground, suggested by Dr Bradley for the actual route, but were obliged to view it from a distance on the opposite side of a stream. The design of this route is to follow the old Immigrant Road through Carson Cañon, Hope Valley and the "Eastern Summit Pass," into the valley of Red Lake – by some called Clear Lake and by others Summit Lake – thence, instead of passing another summit, higher than the eastern, and traveling along the very circuitous old road, it is proposed to pass round the western shore of Red Lake, and keep along on the side-hill at the foot of the steep bluffs that form the western summit, and pass down on the south side of the valley of the Red Lake Fork of the American, until the mouths of Silver Lake Fork and Tragedy Fork are passed; thence ascending obliquely and either crossing, or passing around the north end of the high ridge east of Alder Creek, and crossing the valley of that creek, and the valleys of Wolf Creek and Plum Creek, together with the two ridges intervening, the line again joins the old Immigrant Road at Cold Spring. The peculiar merits claimed for this route are, that it crosses but one summit of the high Sierra; that it greatly shortens the distance, compared with the old Immigrant Route; that it is susceptible of improvement at a cheap rate, and that it

affords abundant pasturage. The objections urged against it are, that in the more elevated region, where snows fall very deep, by keeping under the shady side of a ridge for several miles, the road is liable to be closed for many weeks earlier and later, than on routes more exposed to the sun; and that much of the advantage gained by avoiding the high western summit, will be lost by encountering the ascents of Alder Creek, Wolf Creek and Plum Creek ridges. On my recent trip I examined a portion of the route, as far down as "Lover's Leap," about five miles below Red Lake, which we were not able to examine previously. As had been stated by Dr. Bradley, [found two or three rocky dikes to be cut through, but they were not wide, nor exceedingly costly. The overhanging conglomerate rock is very friable and liable to roll down upon the roadway. In the month of September I found the north slope of the mountain in shadow, by the steep overhanging cliffs above, as early in the day as one o'clock. This would cause the snows to be very deep in winter and to remain late in the spring.

What difficulties might present further down I did not ascertain. As far as I have seen the route I think well of it; but before I should decide to give it the preference over any other, I should wish to examine it with instruments, and also carefully consider the testimony and arguments in relation to the snow. Below Taylor's Ranch, or Cold Spring, the present road is quite good, or can easily be made so, without the agency of the State.

East of Red Lake, on the old Immigrant Trail, the road over the eastern summit, needs some improvement before reaching the summit, principally in the way of removing boulders and smaller stones, and at the descent into Hope Valley, about 700 feet of decent, the road needs to be entirely regarded on a new route. Hope Valley presents a good natural road, with a grade of about two degrees. Carson Cañon, extending for five miles between two lofty and rugged cliffs of granite, was formerly the terror of all travelers, on account of the enormous granite boulders with which the route was obstructed; but it has been recently much improved, by partially clearing out the roadway and erecting two bridges, which give access to better road on the other side of the stream. It still needs much improvement. There is room enough for a good grade, and a reasonable amount of labor will make it as good as other roads. It is worthy of being noticed, that this cañon is a common terminus for three different routes proposed – perhaps for four. All parties, therefore, concerned in either of those routes, must rejoice in the prospect of its improvement.

After having passed through this cañon we continued our examinations along the western border of Carson Valley, to the Mormon Station, distance about seventeen miles from Cary's Mill, at the mouth of the cañon. There is a fair, natural road along the gentle slope at the eastern base of the mountains. The mountains rise very abruptly from the western side of Carson Valley. Their sides are covered with the debris of a white, rotten granite, very friable, and assuming naturally a steep slope. A road-way cut along these slopes would be very sandy, and subject to be constantly filled in by the sliding of the sands from above. There is a pass in the rear of Dr. Daggett's, about three miles south of the Mormon Station, leading over to the south-east corner of Lake Bigler, but it is only used for horses and mules, having never been graded for wagons, on account of the difficulties mentioned above.

Passing along the valley at the eastern foot of the mountains, about six miles below the Mormon Station, we turned in to the left, and crossed a low pass lying to the

south-west of the Eagle Ranch. Over this pass leads the wagon road known as Johnson's Cut-off. The altitude of the pass at its culminating point, appears to the eye to be less than that of any other pass in this range, east of Bigler Lake. It lies opposite to the middle, apparently, of the east side of the lake, and opposite to the low pass which we came through on the Georgetown Exploration. The ascent is smooth, through rather sandy. The grades might be very much improved by side-hill cutting. The descent from the pass to Lake Bigler, in a line directly west, is very abrupt and precipitous, (so I have been told) but the wagon road does not follow this line, on account of the difficulty of passing several rocky points that put into the lake, and several swamps at the mouth of the streams between the spurs. It winds its way along the western side of the mountains, near the origin of the larger spurs and gulches, and – as it appeared to me – (though I had no instrument with which to test it,) in several cases ascends to a much greater altitude than that of the pass through which it crossed the summit. Certainly the sum of the ascents and descents in climbing six or seven of these lofty spurs, would have sufficed to have crossed directly over the highest knobs of the mountain, at almost any point. Before the old road through the Carson Cañon had been improved, this wagon route was probably preferable to that as a mode of approaching Bigler Lake Valley, and the western portion of Johnson's Cut-off Road; but at present, I think any person knowing the two routes would much prefer to reach the upper pass of Lake Valley, by passing through the Carson Cañon, and then through Luther's Pass; and I believe that this is not the opinion of Mr. Johnson, the original explorer and improver of the cut-off through the Eagle Ranch Pass. Although the precise position of the boundary line is not yet determined, yet I have very little doubt that the Eagle Ranch Pass, as well as the pass near Dr. Daggett's, are both in the Territory of Utah.

Passing up Bigler Lake Valley from the Eagle Ranch Road, we came to the point where Johnson's Road rises the steep side of the main Sierra, west of Lake Valley. From this point we ascended the valley about a mile further, and crossed over in a south-easterly direction from Lake Valley, through Luther's Pass, into Hope Valley, at the head of Carson Cañon, distance about six miles. Mr. Luther, of Sacramento, first crossed this pass with a wagon in 1854. It was surveyed during last winter by Mr. Henderson, County Surveyor of El Dorado County, as a portion of the route from Placerville by way of the South Fork, to Cary's Mill. This pass is, naturally, one of the best I have seen over this range of mountains. Several miles of it are now good natural road. The other portions need grading, and removal of rocks. For about a mile the upper portion of the valley through which the pass opens, is occupied by a lagoon and marshy flat. The ascent from Hope Valley presents no difficulty of importance. The difference of altitude from the head of Carson Cañon to the summit in the pass, measured by an aneroid barometer, is about 790 feet. The altitude above the sea is precisely the same as that of Red Lake Valley, and 750 feet lower than that of the eastern summit, on the old Immigrant Route. These altitudes may require some slight corrections, depending upon the variations of the thermometer, not yet fully determined, but are near enough for a comparison of the different points.

The next route examined was the route from Bigler Lake Valley, past Slippery Ford, and down the South Fork of the American River, comprising a portion of Johnson's Cut-off Road, and a portion of the route along the South Fork Valley. Johnson's Wagon Route, after passing Slippery Ford, going westward, ascends the

high ridge dividing Silver Creek from the South Fork, and continues along the crest of the ridge to Bartlett's Bridge. This part of the route, on account of its altitude, is liable to be obstructed by heavy snows in winter, and our examinations were therefore directed to the lower route – hitherto only used as a pack trail – along the valley of the Creek.

The most difficult portion of this route is encountered in the ascent from Bigler Lake Valley to the western summit, about 1,000 feet above the valley. The route lies along a very steep, natural slope, through a thicket of manzanita chaparral, interspersed with large and a small boulders of granite. The present road attains the summit by a length of only three-fourths of a mile, or 3,960 feet, which gives a grade of over fourteen and a half degrees, or about three and a half to four times what it should be. In addition to the steepness of the grade – the difficulty of ascent at present is increased by the presence of a great number of rocks. What has been done to the road already demonstrates, however, the practicability of obtaining a good grade by increasing the distance, and applying sufficient labor to remove the rocks. Most of the rocks can be removed without blasting. It will require about two miles of road to attain the proper grade. The expense of constructing a good road up this hill has been estimated from \$6,000 to \$15,000. I think it should not exceed the latter sum; before making a more exact estimate, I should prefer to make a careful survey of it with instruments. After ascending the steeper portion of the hill, the road rises by an easy, natural grade, about seventy-five to one hundred feet higher, making the total ascent about 1,100 feet. But there is a lower point about a mile south of the present road, where it is supposed the summit may be reached by an ascent some two hundred feet less.

Continuing westward from the summit, the road descends by fair grade through a valley of pines, and over good ground for a road bed about four or five miles, to a rocky cañon above Slippery Ford. The points of two low hills, covered with chaparral and heavy granite boulders, here close in upon the creek leaving no margin for the road. By removing the boulders, most of which are loose, a good grade can be had over the points of these spurs, and thence across the sloping rocks down to the trading post below the Ford. The distance of bad road here to be overcome, is about nine and a quarter miles to get a proper grade.

From this point, for five miles below, the grade may need improvement at some few points, and a few culverts should be thrown across ravines; but the road is at present a passable wagon road as far as the point where Johnson's Cut-off turns to ascend the high ridge. From this point a new road is proposed to be constructed, not following the narrow bottom along the creek (which is at places obstructed by solid spurs of rock for a quarter or half mile in succession), but maintaining a proper grade along the benches of the spurs, at an elevation above the creek of 100 to 300 feet, generally attempting to obtain a uniformly descending grade, but occasionally ascending or descending, as the case may be required, to attain a more favorable bench. At Sugarloaf Rock, about eleven and a half miles below Slippery Ford, the road descends to the bottom bordering the creek, and after passing along this flat for about two miles, again winds round among the benches of spurs. At twenty-two miles below Slippery Ford, or at some point in this vicinity not yet determined upon, it is proposed to cross to the south side of the South Fork by a bridge, and ascend by an easy grade to the ridge leading down to Placerville.

The whole distance on this route from Cary's Mill to its junction with the present ridge road, would be about forty-four miles; of which, about thirty miles would need more or less expense to make a good road. Below Slippery Ford, the principal items of expense will be in side-hill grading and in erecting culverts and log bridges over the ravines. The details of these items can only be given after a regular survey.

It is claimed in the favor of this route that it is a more direct route across the mountains than any other, there being only eighteen miles from Cary's Mill to Slippery Ford, below which the route lies through a valley; that it is less obstructed by snow than any other route, and can be passed in some seasons nearly all winter (as was the case during the last one); and in the more severe winters, it is open six weeks longer in the fall, and six weeks earlier in the spring than other routes through more elevated regions; and as the lower part of the route runs along the sunny slope of the hills in a sheltered valley, the snow is melted off from it soon after it falls, and is seldom over a foot deep. It is conceded that on both the summit portions of the route there will be deep snows, but that the distance from either of these portions to a lower sheltered valley on the road is only from three to four miles, which may soon be traversed by a traveler in view of an approaching storm. It is also contended that the short distance of deep snow will permit the route to be broken open by the travel at each fresh fall of snow.

As far as I have been able to gather testimony on the subject of the snow, the above views have been corroborated. The mail was carried on horseback over this route, with very few interruptions, once a fortnight last winter, between Placerville and Carson Valley.¹⁰ It is also a just claim in favor of this route, that it will open a constant communication with the valley of Lake Bigler, which will doubtless be very extensively settled. At this valley and Lake Bigler will be divided by the boundary line, it will be important that prompt communication be had by the officers of the frontier counties.

It is urged by those opposed to this route and in favor of another, that it crosses two summits, when the true principle of engineering would admit the crossing of but one; that the more difficult portions are exceedingly rough and expensive, and that the ground along the lower part is much broken, and requires much of the road to be artificially made. This latter objection I had at first thought to be a prominent one, but on a closer examination of the route, I found that, although the pieces of artificial road occur at frequent intervals, yet in the aggregate, much of the route requires little or no expense to place it on a par with ordinary country roads. I also found that most of the rocky points could be avoided.

On my recent trip to Red Lake I also examined the old Immigrant Road from Red Lake, over the western summit, past Tragedy Springs, Leek Springs and Alder Springs, to Taylor's Ranch at Cold Spring. In its present state this is a "hard road to travel," on account of the many rocks still remaining in the roadway, and on account of steep grades. These might be obviated with adequate expense; but the principal objections to the route are: that it is very circuitous; that it crosses the high western summit, which might be avoided and, consequently, that it detains the traveler a much longer time among the deep snows, and is utterly impassable in the depth of winter. It was opened, or very much improved, by the Mormons in the summer of 1850, since which time other

¹⁰ Mr. Henderson states in his Report, that in February, 1855, he found in the passes and summits on this route, the snow was about one foot and a half deep, and the first thirty-six miles (that is, the western thirty-six miles), the ground was bare.

parties have improved it at certain points. From the western summit, downwards towards the Sacramento, the route keeps as far as possible on the dividing ridge between the American River, and the Mokelumne and Cosumnes, and along the crest of this ridge there are many miles of good, smooth, natural road.

If there were not other shorter and more desirable routes, susceptible of improvement, it would be possible to make a very good road of this, so far as grade is concerned, but it would always be circuitous and impassable in winter.

Just previous to my last trip on the old Carson Route, an exploring party from Calaveras County, in the vicinity of Murphy's, had passed through Hope Valley and Carson Cañon, to explore a wagon route between Carson Valley and Murphy's. As I did not meet them, I had no means of knowing definitely where they had examined, except from casual information obtained through immigrant parties. I made, however, a short excursion up the upper and southernmost head of Hope Valley, some five to six miles above where the Carson road joins it, and on my return I have learned that this forms a part of their route. We crossed the summit between the head of the Hope Valley fork of Carson River and a tributary of the Mokelumne. The ascent of the north side was not difficult, nor excessively steep or rocky. A wagon might ascend it in its natural state. The elevation was apparently as great as that of the western summit on old Carson route.

Further south, over a low ridge, we could discern the two lakes mentioned in their report, and the route appeared not to be rough, but at a distance the cañon of the Mokelumne river seemed to be deep and rugged. Not knowing the precise route they had passed over, and having no sufficient party for the purpose, I returned.

In summer I have no doubt a good road could be made over that portion which I could see; but the earth had the appearance of being much covered with deep snows in winter. My principal objection to this route is that it traverses the mountains too much in a line parallel with the main ridge, and it must consequently be much obstructed in winter. I have no doubt it would be an excellent route for stock in summer. It is proposed to terminate this route, like several others, in Carson Cañon.

As the result of my explorations, of all the routes examined I should select only two as requiring a full and accurate survey to decide upon their respective merits. These two are the Slippery Ford route and the Red Lake route as proposed to be modified by Dr. Bradley. If these two routes are to be regarded as summer routes only, and a decision is to be made on principles of engineering alone, I should not feel able to decide between them without a careful survey of both; but if the obstructions from snow are to enter into the argument, and it is deemed important, even with some additional expense, that a route shall be selected with a view to winter as well as summer travel, then, perhaps, it may be deemed necessary to survey but one route, and put that immediately under contract.

All estimates of expense, until the proper data are obtained from a survey, are necessarily conjectural. The same remark will apply to distances, as the improvement of grade will increase the distance. Forty to forty-five miles will, I think, be the limit of length of road to come under the supervision of the State, of which not much over half will need any expensive improvements. The estimate will also depend much upon the quality and extent of the improvements which it is decided to apply to the road. What one man would term a good road, might be deemed a very poor one by another. A road

which an immigrant might get through upon with a light load, might not answer the purposes of a teamster hauling goods to Carson Valley and Salt Lake. As regards grade, the facilities for procuring a low or an easy grade, are much greater than I had anticipated, and I deem it quite practicable to construct a road across the mountains at a maximum of four degrees, and quite probably at two or three degrees in many places. It is quite practicable to make such a road across the mountains, that a teamster, having hauled a maximum load over it, would be obliged to unload one-third or one-half of it, before he could pass over some of the roads between Sacramento and Placerville. The cost of improving either of the routes named above the survey, I consider need not exceed \$100,000; and the limit can be varied from that down to \$30,000, according to the nature of the improvements determined upon.

I had hoped to be able to illustrate this Report with an accurate map, and had indeed commenced its preparation, but I find that many of the data requisite for its completion remain in the mountains in the note books of Mr. Goddard; many require considerable time to digest, and others are yet to be obtained by the astronomical party, and also by the U. S. Surveyors. The surveys of the road will also add many precise data for the map. At the close of these surveys, we shall have the data for constructing a more accurate map of the mountain region south of Lake Bigler than any that has yet appeared. A valuable list of altitudes taken both with the barometer and the theodolite, is also in preparation. In the mean time, I must refer you to a rough sketch of a map which I made after returning from the Georgetown exploration, which I have altered in some particulars, and marked thereon the various routes explored.

An engineer, before making an estimate of the cost of improving a road or constructing a new one, usually desires to have a plan of the route, with distances, grades, side slopes and streams distinctly and definitely marked upon it. This we have not yet. It is the very thing proposed to be entered upon *preliminary* to the estimates.

I submit the above views with much reluctance, in consequence of not having precise measurements, upon which to base a calculation of cost and distance. Should the survey of either route be actually made, the facts can then be presented in a satisfactory form.

I have the honor to subscribe myself, with respect,
Your obed't serv't,

SHERMAN DAY

Sacramento, 20th Sept., 1855.

3. HON. SHERMAN DAY'S REPORT ON WAGON ROAD SURVEY.

Hon. S. H. MARLETTE, Surveyor-General:

Dear Sir:

On the 12th December last I transmitted to you, from Slippery Ford, a report of the progress of the survey of the Immigrant Wagon Road, as far as that point, with an estimate, somewhat hastily made, of the cost of construction of the eastern portion. On the first page of that report I gave a synopsis of the distances of the five divisions of the road, then surveyed, with a brief description of the course of the line. A copy of that synopsis I herewith annex, to save repetition.

I there noted that, of the six miles in the fifth division, from Johnson's Summit to Slippery Ford, (six miles,) only one mile had been located. This was on the 12th December. We remained there two days longer, and surveyed an additional half mile, eastward from the summit of Slippery Ford Hill, as far as the upper side of the next spur that closes in upon the river; and we also completed the location of the unfinished portion at Slippery Ford House, making, of the six miles between Johnson's Summit and Slippery Ford, one and two-thirds miles of line surveyed, and four and one-third miles unsurveyed. As I had become quite familiar with this four and one-third miles during the previous summer, and knew that much of it was flat meadow land, and some of it gently rolling land along the side of a stream, and none of it difficult or impracticable, I thought it better to defer the surveying of it until spring, the snow being now about fifteen or eighteen inches deep. This depth of snow did not render it *impossible* to survey any portion of the line, but it rendered it quite inconvenient for the party to travel daily so far from camp and return again at night, leaving but a short time to spend in surveying.

While at that camp we also surveyed the line below Slippery Ford, for 7,679 feet, or 1 45-100 miles, as far as the upper end of Strawberry Flat. This portion of the line is over ground generally smooth and of easy grade. Below the termination of that surveyed line, the route continues for one or two miles along a level flat, except where one small spur closes it upon the river. We might have continued our survey without interruption, below this point, if our supplies of provisions had reached us, according to previous arrangements. But after waiting two days beyond the appointed time, and reducing our stock to a supply for two days only, we were compelled to leave camp at Slippery Ford, on foot, and march through the snow to a new cabin which Mr. Kirk had ordered to be built for us, about twelve or thirteen miles below, on the South Fork, at the eastern end of Sugar Loaf Flat. This place we called Sugar Loaf Cabin. It is below the point at which deep snow is found, on the lower and southern slopes of the ridge.

Fearing that I might not be able to complete the continuous location of the whole line, before the close of the year, I determined to survey the most important and difficult points along the South Fork, in detached portions, if necessary, and estimate the more easy portions by my general knowledge of the route, acquired on several trips last summer over the route.

Commencing the South Fork line, near Sugar Loaf Cabin, we ran a line up the river winding along the side hills at an altitude generally of 100 to 300 feet above the river. We continued this line in all 4 59-100 miles, or 24,246 feet. It passes below

Cottage Rock, but not very near to it, and beyond that crosses the large creek and cañon, descending from Silver Creek Ranch, and turns round the point of a high spur at the foot of a rocky ledge. The line up to this point is nearly all along side-hill slopes of various grades, usually with an earthy or gravelly bed, but occasionally encountering large boulders, or some bed-rock near the surface. It may be considered about as expensive as Carson Cañon, or the rougher portions of Hawley's Hill and Luther's Pass. We found it necessary to survey several lines on some portions of this division, before determining upon the proper location.

On account of the obstruction from snow, and the distance from camp, we abandoned the further prosecution of the survey up the river, leaving an interval unsurveyed from here to Strawberry Flat of about six and a half miles. The point at which we stopped is about two miles below the junction of the river trail with the ridge road passing Silver Creek. There is no doubt about the practicability of this unsurveyed portion, and at an easy grade. Four and a half miles of it is already used for a wagon road. As the snow – about fifteen inches – prevented our observing the precise character of the ground, it was thought best to leave the location of the line until Spring.

Recommencing at the former point near Sugar Loaf Cabin, we ran the line down across the flat in front of Sugar Loaf Rock, which is about a mile below the cabin, and about sixty feet above the level of the river. Having passed the rock, the line rises gradually as it turns round the spurs putting out from the base of Pea-vine Hill. About 4-1/8 miles the line attained a height of about 600 feet above the river, and passed round the foot of a rocky ledge without cutting into it. Below this point near the bank of the river we built another cabin, to which we gave the name of Cedar Cabin, and removed our camp to it.

On my recent trip to this city, I had passed between Cedar Cabin and Brockliss' Bridge, a distance of some twelve miles, both along the spurs about one hundred to two hundred feet above the river, and also about half-way up the side of the main ridge, above the origin of most of the small spurs and ravines that shoot down towards the river. Occasionally a larger ravine or cañon obtruded past the upper line, and extended towards the crest of the main ridge. It appeared to me that this upper line, if it did not encroach too much upon the snow line, would present a smoother line than that along the river, and avoid several of the sharp, rocky points and little gulches of the lower route. The river route, however, would probably be shorter, and present a line with less ascent and descent. It was my intention, therefore, to have two lines run, diverging from Sugar Loaf Flat: one following the upper line, near the snow line, and the other the river route, as far as Brockliss' Bridge.

When I left the party on the 5th of January, they had progressed on the upper line about one mile below Cedar Cabin, and the prospect for a good line ahead was quite favorable. The last mile run encroached slightly beyond the line of snow, but only to a depth of six inches to a foot in the most shaded positions.

Between Sugar Loaf Cabin and Cedar Cabin, the upper line crossed very few points from which the snow was not melted.

On the ten miles surveyed along the South Fork previous to my departure, the portion above Sugar Loaf Cabin is the most difficult and costly, although I do not know of any one mile there that should be more costly than the slope of Johnson's Hill or Slippery Ford. Several rocky points, but not of great length, are passed, and many

short, steep ravines. The line below Sugar Loaf Cabin is about on par with that along Hawley's Hill, and the lower part of Luther's Pass.

It has been impossible for me, amid the incessant labors of the field, or during my hurried journeys to this place to review the field notes of the line, so as to present herewith an accurate estimate of the route as far as surveyed; nor would such an estimate be of much value until the remainder of the line to, and below, Brockliss' Bridge, is completed. A more full report will be presented when the notes of the whole survey can be reviewed, and maps and profiles may be made from them.

I left the completion of the remainder of the line in charge of Mr. Thomas J. Arnold, my Assistant, who is fully competent to the task, and to whom I have communicated my views on the subject. He will probably be able to finish the survey in about three weeks. On my journey down, along the river route, I encountered scarcely any snow; and as snows have fallen very copiously this winter, I presume it is a safe conclusion, that the southern slope of the lower half of the main ridge, along which our survey line extends, is generally free from snow all winter.

It may, perhaps, be due to myself and the party with me, to render some reasons why the survey has occupied so much time. One reason was, that the survey having been commenced at a late period, we were more interrupted by cold, snow and storms, than we should have been in summer. The want of ample pecuniary means, or of undoubted credit, by which to obtain supplies, teams and men, at proper times, and in sufficient force, tended greatly to interrupt and retard our operations. Another, and, perhaps, the chief reason, is that much of the route was of that peculiar nature, that, although one could see easily by a general glance at the locality, that the proper route was somewhere about there, yet it often required two, sometimes three, experimental lines to be run before the final location could be determined upon, that would properly connect all the points.

As far as practicable, observations with the aneroid barometer and thermometer, have been continued along the line, and comparisons made of the barometric with the measured altitudes. On one night in Hope Valley, in November, the thermometer reached a degree of cold 18° below zero. These observations will be more carefully collated and reported hereafter.

I remain, Sir,
Very Respectfully,
Your obed't serv't,

SHERMAN DAY.

SLIPPERY FORD, 12th December, 1855.

Distances and Divisions from the Eastern Terminus of the Wagon Road to Slippery Ford.

FIRST DIVISION.

The eastern terminus of the Road is in the Carson Cañon, at a point 1-2/3 miles south-west of Cary's Mill. The first division extends from this point to Station Z, at the head of the Cañon, and on the east edge of Hope Valley. Distance by the graded line in miles 4.33

SECOND DIVISION.

From Station Z, around the northern end of Hope Valley, and over Luther's Pass, and along the north bank of Marlette's Flat, to Station 35 as the outlet of the flat. Distance by graded line..... 4.95

THIRD DIVISION.

From the outlet of Marlette's Flat, along the north bank of the outlet stream for about 1 mile, then crossing the stream three times in descending Hawley's Hill (on the east side of Lake Valley), crossing the south-west branch of Truckee River, to Station 124 at the foot of Johnson's Hill. Distance by graded line 4.16

FOURTH DIVISION.

Comprises the steep eastern slope of Johnson's Hill, from Hope Valley to the summit. Distance by the graded line 2.00

Total of connected line actually located 15.44

FIFTH DIVISION.

From the summit of Johnson's Hill to Slippery Ford House, (of which there has been located 1 mile, at and near Slippery Ford to the top of the hill,) estimated from Henderson's survey at, miles 6.00

Total distance from eastern terminus to Slippery Ford 21.44

NOTE – Since the above was transmitted, the amount of located line east of Slippery Ford, forming part of the above 6 miles, is 1-2/3 miles – leaving 4 ½ miles on the summit unsurveyed. Also, about 1 ½ miles were located below Slippery Ford House.

REPORT OF A SURVEY

OF A PORTION OF THE

EASTERN BOUNDARY OF CALIFORNIA

AND OF A

RECONNAISSANCE OF THE OLD CARSON AND JOHNSON
IMMIGRANT ROADS OVER THE SIERRA NEVADA.

REPORT.

Sacramento, Dec. 15th, 1855.

To the Hon. S. H. MARLETTE, Surveyor-General:

Sir:

I have the honor to submit the following Report of the Survey, intrusted to my charge, and carried out, as near as circumstances permitted, in conformity to the following instructions received from you:

“SURVEYOR-GENERAL’S OFFICE,
Sacramento, Aug. 3, 1855.

Sir:

As you are now provided with the necessary men, animals and instruments, you will proceed without delay to Placerville, *en route* for Carson Valley. At the former place you will determine the latitude and longitude, and the rate of your chronometers, by astronomical observations, and by comparing your chronometers and local time with those of San Francisco, which you can readily do, by means of the Telegraph lines which have been kindly placed at your service for this purpose.

From Placerville to Carson Valley, *via* Cold Spring Ranch and Carson Pass, you will take such barometrical observations as will enable you to construct a profile of the route. You will also take, so far as practicable, a somewhat accurate sketch of the country traversed, and collect such other data as in your opinion will be of service in comparing the merits of this with other routes, for the Immigrant Wagon Road, in respect to both practicability and economy of construction.

At or near Carson Valley you will determine, astronomically, with some precision, the position of the eastern boundary of the State; and I would suggest that such portion of the State line as shall fall in Carson Valley, or so much of it as you may deem necessary, be measured and defined with tolerable accuracy, in other that it may be used as a primary base for the determination, trigonometrically, of the position of such points as it may be found necessary to determine for the purpose of connecting our surveys and explorations, and for fixing the eastern terminus of the road.

Somewhat durable and conspicuous monuments should be erected at the termini of the primary base, and perhaps at the extremities of some of the secondary bases, from which shall be taken the bearings of the prominent and well defined peaks of other objects of the Sierra Nevada, and other mountains, and of the adjoining country, of which you may obtain a view.

The men and animals provided you, have been furnished by Judge Hyde, of Utah Territory, who will provide all the assistance and provisions requisite, after you leave Placerville until you return to the same place.

On what route you had better return I have not decided, but this is of no consequence, as I intend meeting you in Carson Valley, but should I not do so, you will consult with the Hon. Sherman Day, with whom you will probably meet in that vicinity, and return by such route as is in his judgment will most facilitate the selection of the most practicable and economical route for the Immigrant Road.

You will, of course, take the same observations coming as going, so far as practicable.

Inform me of your progress as often as you shall find it convenient to do so, and oblige,

Very respectfully, your obedient servant,

S. H. MARLETTE,
Surveyor-General.

GEO. H. GODDARD, Esq., Civil Engineer," etc.

Provisions to the receipt of the foregoing letter I had, according to your instructions, collected together the several instruments and other requisites for the expedition, and had progressed considerable with the preliminary observations.

The following is a list and description of the instruments provided and used on the Boundary Survey:

An Altitude and Azimuth Instrument, by Parkinson & Frodsham, of London: with horizontal circle twelve inches in diameter, divided to ten minutes, and reading to ten seconds, by the verniers, with a vertical circle sixteen inches in diameter, divided to five minutes, and reading to five seconds, by the verniers; the telescope had four feet focal length, with a three-inch object-glass, and two eyepieces, with magnifying powers of 120 and 180 times. The Instrument was supported on a central pillar, and the telescope revolved at one extremity of its axis, by which it was more adapted to astronomical than geodetical purposes.

A very fine 6 ½ inch Theodolite, of English make and usual construction.

One large Chronometer, by Dent, London, No. 1,946.

One small Chronometer, by Parkinson & Fordsham, of London, No. 1,628.

An Iron Cistern Mountain Barometer, by Green, of N. Y., divided on the tube.

An Aneroid Barometer, by James W. Queen, No. 264, Philadelphia.

One Marine Opera Glass.

One Thermometer.

The above instruments were provided by you as the property of, or hired by, the State; in addition to these, I used the following instruments of my own:

A Sextant of 7-inch radius, by Hughes, of London, divided to ten minutes and reading to ten seconds.

Two Artificial Horizons, with quicksilver troughs.

A Surveyor's Compass, by Young, of Philadelphia.

A Prismatic Compass, by Schmalcalder, of London.

A Camera Lucida, by Chevallier, of Paris.

One small Thermometer.

A Telescope and a Pocket Compass.

William Herrick, Esq., of the *Alta California* office, San Francisco, kindly loaned me a Borda Reflecting Circle, with Troughton's improvements.

It being desirable to connect the proposed survey with the geographical position of Sacramento, a small observatory was erected on the building occupied as your office, and the Altitude and Azimuth Instrument was set up and adjusted to the plane of the meridian. The tremulousness of the ground, however, upon which Sacramento is built renders it an unsuitable place for astronomical observations; and those taken for latitude, longitude and time, were somewhat uncertain.

Previous to leaving Sacramento I compared my Greenwich time with that at San Francisco, by means of the Telegraph, which was obligingly placed at your disposal by its liberal proprietors.

The transmission at San Francisco was attended to by Mr. Charles Pace, chronometer maker; and the time sent was that deduced from Anderson & MacGregor's transit observations, at their observatory on Telegraph Hill. The results of this comparison will be found under the heading "Astronomical Observations."

I had much desired to have had the chronometers carried, in the way they were to travel, for a few hours daily, before leaving Sacramento, in order to have an opportunity of rating them when in motion, but it was judged best not to delay our journey on this account.

The men sent by Judge Hyde to form my party were as follows:

CHRISTOPHER MERKLEY, of Great Salt Lake City.

SETH DUSTIN, " " "

GEORGE W. HANCOCK, " " "

The two latter performed the journey on foot, carrying the chronometers and barometers; the former were packed in hand-baskets, well stuffed with wool.

PLACERVILLE, ALTITUDE 1,755 FEET.

On the 4th of August I started my party for Placerville, with the pack animals and camp baggage, and on the following morning I took stage with the instruments.

The readiness shown by the aneroid at several points on the road, will be found under the Meteorological Observations, and the altitudes deduced therefrom, in the table of Altitudes.

In the evening my party, which I had passed on the road, arrived, and I was glad to find the chronometers appeared to have traveled thus far without injury.

It had been my intention to have selected for an astronomical station, a commanding point of view on one of the hills above the town, from which I could have seen the leading mountain peaks on the head waters of the American River and other well known objects. With the intention of selecting such a place, the morning after my arrival, accompanied by Messrs. Cary and Lyon, I walked round the hills forming the

divide between the Placerville waters and those of Weber Creek, as far as the aqueduct on the South Fork Canal, at the head of Cedar Creek. I, however, found no site that would have answered, without clearing away a great deal of timber that interrupted the prospect. Perhaps the most favorable one for the purpose, is the point on the hill some 300 yards to the left of the stage road, where it crosses the ridge just before entering Placerville. I was much disappointed in finding the horizon very smoky, and Monte Diablo, the Jackson, Butte and most of the peaks of the Sierra, completely hidden from view.

On returning to Placerville, I found that there would be some difficulty in procuring provisions and camp equipage for present use. As I had no funds at my disposal for purchasing the same, and as it had been arranged that my party could board at Cary's Hotel, I concluded that it would be more convenient to choose a spot nearer town for the astronomical station. Accordingly I selected the summit of a knoll a little east of Cary's, and had the camp set up, and the instruments removed thither.

The mountain barometer I kept at the hotel, it being less liable to accident there than at the tent. On first setting it up it coincided exactly with the aneroid, each read 27 in 83. In a few hours, however, air bubbles ascended the tube, and I had some difficulty in removing them. I consider this construction (Green's Iron Cistern Mountain Barometer,) as faulty, in consequence of the open space underneath the cistern; for on immersing it in the cup of quicksilver, pent up air remains in the cavity, and continually works through between the ring and plate at the bottom of the cistern, and ascends the tube, causing a great deal of trouble.

August 8. – I was engaged the whole day in setting up, clearing and adjusting the altitude and azimuth instrument. In the afternoon the cross hairs, which consisted of three horizontal and five vertical wires, were by some cause broken, very probably caused by the great heat of the weather, the thermometer standing at the time at 104 in the shade. I sent the diaphragm to Mr. Tennent for a new set. I was informed to-day by Mr. Cary, that the party who was to have supplied me with the provisions for the journey on the credit of the State, had declined doing so except for cash, having understood that there was already an appropriation of \$5,000 for the Wagon Road Survey, which could be drawn upon. I afterwards saw Mr. J. Kirk, who promised to get the matter arranged, or to supply the requisite funds himself.

August 9. – Took observations for time with the sextant, from which it appears the chronometers have materially increased their rates. The heat continues excessive.

August 10. – Had a fly made and spread over the tent, which has made it rather more endurable. Took a set of equal altitudes for time. In the afternoon Mr. Day arrived, and reported very favorable on the South Fork Route for the proposed Wagon Road. The day has been slightly overcast; a strong east wind caused the barometer and aneroid to sink about a tenth of an inch.

August 11. – Received the cross-hair diaphragm from San Francisco, Adjusted the instrument, and took the azimuth of Polaris at the eastern elongation, and fixed the instrument on an appropriate meridian. During the evening I remarked numerous shooting stars in proceeding apparently from a point near Capella.

I was detained in Placerville until the 26th of August. The altitude and azimuth instrument required some little repairs. The vertical circle was slightly bent, probably from the shrinkage of the case in which it was packed, caused by the heat in coming up

by the stage from Sacramento. The stand also, which had been made for the instrument, had become twisted, and rendered entirely unfit for the purpose from the same cause. Thereupon I had a block cut from a dry log, and sunk in the ground sufficiently deep to make a firm pedestal, on which to place the instrument; which was at length fixed in tolerable adjustment on the meridian. Finding it impossible to preserve the instrument in perfect adjustment, I made a scale of the error for each level, from which a correction has been deduced in the final computation of the results of the observations. During our stay at Placerville a series of observations were taken, which, together with those with the sextant and theodolite, amounting in all to 137 observations for latitude and 244 for time, will be found under the head of Astronomical Observations.

The direct observations for longitude were necessarily few; the moon passing the meridian before the stars were visible, until the last day or two of our stay, prevented my obtaining more than one lunar transit. Several eclipses of the satellite of Jupiter were however obtained, which agreed nearly with the longitude deduced from the time observations, and rates of the chronometer. To make the matter of longitude quite certain, I had the Greenwich time transmitted to me by telegraph from San Francisco in the same mode I had at Sacramento. As the line between Placerville and San Francisco was owned by two different companies, there was some little difficulty and delay in adjusting the wires together, and it was not until the second day that the attempt was finally successful.

Mr. Day fearing that some accident might prevent my getting the time correctly by telegraph, measured an extension of the second standard parallel of the U. S. Land Survey, from the corner of townships ten and eleven north, ranges eight and nine west, near Salmon's Falls, to within a short distance of Placerville, connecting it with my astronomical station, thus giving the longitude by absolute measurement. There was, however, a difference of about half a mile in the result, which has since been explained by an error of fifty-two chains having been found in the standard parallel, as originally run.

The shortness of the time I have had at my disposal for the purpose, has not allowed me to re-compute all the observations taken at Placerville; sufficient, however, have been calculated to reduce the amount of error to a very small fraction. The geographical position of the astronomical station is as follows: Latitude, $38^{\circ} 43' 32''$; Longitude, $120^{\circ} 46' 23''$ west from Greenwich, and the altitude above the level of the sea, measured by successive differences with the aneroid barometer, 1,885 feet.

I measured a short base line, and lengthened it by intersections, making compass bearings to all prominent points from several stations in the valley and on the hills, so as to enable me to make a tolerably accurate sketch map of the town and county around.

Placerville is situated in a valley almost entirely surrounded by hills, whose even and tabular appearance is highly suggestive of a sedimentary origin. The summit of these hills is composed of the horizontal sand and pebble beds, which so generally crown the ridges throughout the mining districts. The various streams belonging to the Placerville basin have mostly sunk themselves to the underlying slate rock, over which they flow to a common center at Placerville, leaving their beds full of the rich deposits which have attracted so many a weary immigrant to settle here, and build up a flourishing city, in one of the earliest discovered, and richest of the gold-producing

basins of California. Standing on the rim of tabular land, and looking across the valley, is it not less a stretch of fancy than a recalling of a past state of things, to imagine the period when this basin did not exist, when the wide extended gravelly plain stretched in its length and breadth across the country, instead of simply tipping the summits of the divides? And then glancing onward from this ancient day to the present, we see the little rivulet washing out the sands, and rolling the pebbles onward, always deepening and widening its beds, until the firmer underlying rock is reached, whilst in like manner the side streams are deepening their courses to keep pace with that creek, whose tributaries they have become. This have changes been brought round, till all that remains of the ancient plains is now to be found in the narrow rims dividing basin from basin, or cañon from cañon. And it is to this basin-like formation that these districts owe their peculiar richness, for the specific gravity of the sands and pebbles of gold so thickly sown throughout these gravel beds, has retained them, whilst the rest has been washing away. The tunnel miner of the present day is but doing that which nature through her countless ages has been doing before him on a larger and on a grander scale. The wide, extended auriferous, sedimentary deposits, which she has left in tact, are now becoming the great fields of enterprise, and are yielding their harvest of gold to the persevering miner.

I gathered some few flowers here, which, on my return, I submitted, with others gathered on the journey, to Dr. Kellogg, of San Francisco; a list of which, with their botanical names, will be found at the end of this report. It was too late in the season, however, to obtain many.

We were, as you are aware, detained somewhat by want of funds, and difficulties thrown in our way, by those to whom I had been directed to look for assistance. However, on your arrival, all these matters were finally arranged and I was supplied with the provisions, camp equipage and extra animals I required. There being considerable risk in carrying the altitudes and azimuth instruments on the pack mule, I endeavored to procure a light wagon for the transport of all our instruments; such, however, was not to be found in Placerville, and Mr. Kirk lent his buggy, with one horse, for the purpose, and a second was obtained from Mr. Ferrel, who agreed to accompany us and take charge of the extra animals.

As the time approached at which the U. S. District Court was to hold its session for the Western Division of Utah Territory, Judge Hyde impressed upon me the necessity of proceeding on our journey without further delay, so as to determine whether Carson Valley was legally under its jurisdiction. Elder Hyde, who had been appointed by Judge of Carson County, had been withheld from opening his Court, and issuing the election proclamation, from the uncertainty as to which side of the boundary line the valley might lay. The Judge had rendered me much valuable assistance during my operations, and had delayed his own journey to accompany us on ours.

I had determined to fix some point near the 120th meridian, before descending into Carson Valley, from which I could locate the position of the leading peaks of the Sierra, in relation to the boundary line; and for this purpose I intended to camp, for a week, on or near the dividing ridge, in some suitable locality. As this arrangement afforded Mr. Day a further opportunity of examining the Clear Lake Fork of the American River, up which Dr. Bradley's proposed road was to be located, he determined to accompany me as far as the summit.

On the evening of the 26th August we started from Placerville. Our party, as finally equipped, consisted of the three men before named, and Mr. Ferrel, Elder Hyde and the Hon. Sherman Day. To transport ourselves, instruments and provisions, we had a buggy with two horses, two riding horses, and the two pack horses and mule originally brought from Carson Valley.

HAWLEY'S, ALTITUDE 2,674 FEET.

A bright moonlight evening's ride of seven miles, brought us to Hawley's, where we made our first Camp. From Cary's Hotel the town stretches up the valley for nearly a mile. The Immigrant Road, after crossing the Placerville basin, ascends the ridge to the north-east by a long but easy hill; this ridge divides the Placerville waters from those running more directly to the South Fork of the American. Here it may be said the forest begins, as up to this point the pines have been scattering and intermixed with oak. In the ascent of the Sierra every district is particularly marked by its vegetation. On the foot hills the white oak is spotted over the country in considerable numbers, yet never sufficiently so to assume a forest character. These trees, from their stunted and rounded forms, always appear as individuals, and in however close proximity they may be, they never combine to give a wooded character to the scenery. The flex, or live oak found in the same localities, and more abundantly near the streams, contrasts its dark foliage and black bark, to their light foliage and white branches. Its ancient and highly picturesque forms add considerably to the beauty of the landscape. On attaining about 1,000 feet elevation above the sea, the first of the pines is met. The *Pinus Sabiniana*, a tree which in form almost appears to be a link between pines proper, and deciduous trees. Its foliage is of a silver green color; the nuts it bears are used as food to a large extent by the Indians, who are said to prefer them to any other pine nuts. This tree scarcely reaches to an altitude of 2,000 feet, except in the more southern portions of the country; but it is more than replaced by the pitch-pine, (the *Pinus Brachyptera*,) which, for another 1,000 feet, is the leading tree. The white oak, at this elevation, is seldom seen. Several other varieties of oak found lower down, have also disappeared, but a black oak, with straggling branches, still represents the family. The timber of this tree is hard and durable, but too crooked to be of much service except for fire-wood. The balsam-fir (*Pinus Balsamia*) also grown to some extent in the pitch-pine district. On attaining an elevation of 3,000 feet the sugar-pine (*Pinus Lambertiana*,) the pride of the California forest, is the first found. This truly magnificent tree becomes, as we continue to ascend, the chief tree of the forest. It has been so often described, that I only allude to it here in its character of marking a particular elevation, from 3,000 to 5,000 feet above the sea. With this tree the white cedar, or *Libocedrus Decuneus*, is associated; and in the higher portions, the spruce-fir.

The total rise from Placerville to Hawley's is upwards of 900 feet, and one-half of this is made in the first ascent to the ridge. After which, the ascent is very gradual, and could be made much more so if required.

We camped at 10 P. M. under a group of cedars, when Mr. Day and myself took some observations for latitude and azimuth, and set the theodolite on an approximate meridian. Later in the night, I got a meridian transit of Polaris.

The following day being Sunday, we remained in camp. I obtained observations for time, and also bearings from an open point on the ridge of some of our known

localities. The forest, however, was too thick to be able to see much from any one point.

August 27. – This morning the camp was moving early, and we made a good start. The road continues along a ridge generally rising, although there are some slight undulations.

SPORTSMAN'S HALL, ALTITUDE 3,246 FEET.

About 3 ½ miles brought us to the Sportsman's Hall, where there is a steam saw mill doing large business. The barometer gave rise of 570 feet from Hawley's. The ridge from Hawley's having headed, the Placerville Creek becomes the divide between Weber Creek and the streams flowing northwards into the South Fork of the American River. The forest becomes more dense and imposing as we ascend, the pines larger and taller; the sugar-pine has outnumbered the pitch-pine; the fir begins to show itself. The latter and the cedar have their trunks very frequently covered by a bright pea-green moss, which has a very striking appearance; it does not appear to grow on any of the other forest trees. In continuing up the ridge, some few sharp ascents occur, which however could all be avoided should a new road be laid out along the ridge.

FORKS OF ROADS, ALTITUDE 3,942 FEET.

Four miles more, with an ascent of about 700 feet, brought us to the junction of the old Carson or Ridge Road and the Johnson or Cut-off Road. The latter descends to the north and crosses the South Fork at Bartlett's Bridge, some 1,400 feet below this point.

We continued along the Carson Road, which here bends off considerable to the south-east and descends some 200 feet in the next two miles. This is the low depression in the ridge which is seen at the head of Weber Creek, from Placerville Hill, and over which Pyramid Peak and its group are seen in the distance. Here the Diamond Springs Road branches off a divide to the south.

TAYLOR'S, ALTITUDE 4,517 FEET.

About 9 ½ miles further we arrived at Cold Springs Ranch, finely situated on one of the heads of Sly Park Creek, and at the foot of Iron Mountain. From the low depression spoken of to this point, there is a rise of 780 feet, exclusive of several ascents and descents of the ridge which there is no necessity to traverse. The house is about 200 feet below the summit of the divide at the foot of Iron Mountain. From Placerville to this point there is one of the finest ridge roads that could be desired. The total distance, 25 miles from Placerville, with an absolute rise of 2,760 feet, as given by the barometer – which would make the top of the divide at the foot of Iron Mountain, about 3,000 feet above Placerville. A road of a continuous grade could be laid out along this ridge, but for railroad purposes it would be too steep – 120 feet to the mile. The increased distance might reduce it to about 100 feet; and this, let it be recollected, is usually and justly considered the easiest and best part of the road. At Taylor's, or Cold Spring Ranch, one of the difficulties of the old Carson Road occurs. The ridge now makes an

abrupt rise, up which the road continues at a very steep grade. This ascent is known as Iron Hill.

It is at the foot of this hill that Dr. Bradley's proposed new road turns off on the northern slope of the divide, crossing or heading round Plumb, Wolf and Alder Creeks, and continuing as near a uniform grade as the nature of the country would admit of, to the Clear Lake Fork of the South Fork of the American River. The great object of this route was to avoid the steep hills and elevated ridges of the old road, which for so large a period of the year are buried deep in snow. This proposed road traverses some fine valleys, and has good feed along most of its course. It would be a great improvement on the old road, besides materially shortening its distance; but being for the most part on the northern flank of the mountains, and at a high altitude, I fear it would not have those advantages for a winter road which have been contended for.

After taking bearings to all the prominent points around, we resumed our journey and proceeded some 4 ½ miles further, ascending Iron Mountain and continuing along the ridge which headed round Sly Creek to the south and Plumb Creek to the north. Unfortunately, the men had gone ahead while Mr. Day and I were taking observations at Taylor's, and I was thus deprived of noting the barometer on Iron Mountain and this portion of the ridge.

CAMP SPRINGS, ALTITUDE 5,497 FEET.

It was above an hour after dark when we got to Camp Springs, where we found our party encamped, and also Mr. Taylor, who was returning from the Sierra with a wagon-load of snow for the Placerville market. He gave us a great deal of information on distances, etc., along our route.

A great improvement on the present road up Iron Hill could be made at small expense, by cutting a road round the side of the mountain and coming out on the divide at the head of Plumb Creek. The distance might be slightly increased, but not much, and the grade need not exceed 200 feet to the mile. There is a low depression in the ridge at the head of this creek, the descent into which by the Ridge Road would be thus entirely avoided. The first mile out from Taylor's makes a rise at present of not less than 700 feet, and perhaps more. This is an improvement I would strongly recommend, as it would avoid a very bad hill.

On the moon rising, Mr. Taylor left us to continue his journey. His reported the mountains as freer from snow than he had ever known them before. I procured some good observations of Polaris for latitude. The night was very cold, with a heavy dew. The distance traveled to-day was twenty-two miles; our altitude by barometer, 5,497 feet.

After passing Taylor's Ranch, the character of the forest altered much. Its air of luxuriance was gone. Sturdy, tough and of slower growth, few trees reached 150 feet on the ridges, though in the bottom of Camp Creek, to the south, fine timber still appeared.

August 28. – Before starting I obtained observations for time. Camp Springs is on the southern slope of the ridge, half a mile from the divide, and falls towards Camp Creek, near which there is another branch of the Carson Road, which diverges from this on Iron Hill, and re-enters it a few miles higher on the ridge. It is used by drovers, from being well supplied with grass and water.

Immediately on starting, our road re-ascended the ridge, at which point we took bearings on Pyramid Peak and several other points. The ridge continued from some five or six miles to the north-east and east, to the head of Camp Creek. In this distance there is a rise of 950 feet, but the road is good and all the ascents easy. Alder Hill rises abruptly at this point, and is another of the bad points on this road. This hill is composed of white granite, and the road ascends it between large boulders and masses of rock. The ridge from Taylor's to this point is composed of gravel and pebbles, belonging to the conglomerate which overlies the granite. Occasionally large boulders of granite are met. Here, however, the white granite country is entered. From the summit of the first bench of Alder Hill, a very fine view is obtained of the tributaries of the South Fork and the mountains beyond. This mountain forms the head of Alder Creek to the north and Camp Creek to the south. The road, after having ascended a second bench of the hill, descends again about 200 feet to Leak Springs, which are in a valley, tributary to the Cosumnes; from the summit of Alder Hill to Leak Springs, the distance is about a mile, and the course south. This portion of the road might be improved by a sidling road being carried from the head of Camp Creek round the hill towards the south, and passing over the ridge into Leak Spring Valley, a lower point. The road would then be comparatively easy.

From this space the road still continues in a southerly direction, passing on the south-west side of the divide, and across it again to the head of a stream running to the South Fork of the American; indeed, in this part of the ridge, the streams on each side interlock each other so as to destroy its ridgelike character altogether. At this point we first enter the true breccia formation, which is so largely developed in the Sierra Nevada, and forms so much of its forest scenery. This rock is composed of angular fragments of older rock cemented together with a substance harder than the rocky fragments themselves; red and gray porphoritic rocks appear to composed its principal mass, yet many other rock enter into its composition; often boulders or fragments of white quartz are to be found, and on some of the most elevated peaks, I have taken out petrified wood, which, from my experience, I should say is very abundant in this formation. I may here pint out one of its remarkable features, that the breccia formation is *never found in the valleys*, except as a huge fragment which has rolled down from the hights above, and wherever it occurs it overlies the granite and forms the *upper portions of the ridge*, often cropping out in long extended horizontal steps around the upper benches of the hills. It bears the appearance of having been once a continuous formation, which has overspread this part of the country to a considerable extent, and that the portions which now exist are merely the fragments left by previous convulsions of nature. Whether this rock is a true volcanic breccia which has flowed in a more or less fluid state from a volcanic crater, or merely a highly metamorphic portion of the conglomerate formation, which is as extensively developed on the lower hills, there is, I believe, not yet sufficient evidence to prove; but as I shall have occasion to refer to this rock repeatedly on our journey, I shall proceed with the description of the route.

From the head of the creek last alluded to, the road bends round the north flank of a rough breccia hill for about a mile, coming out on the ridge again at a depression, where the rock is of white granite; a fine open valley, with a large flat, lies to the south, falling away very gradually toward the Cosumnes. Indeed, in this part of the ridge, the difference between the slope of the country to the north and south is very striking.

While the country descends with smooth and easy steps to the south, it falls away most precipitously to the north. This portion of the Ridge Road is very good; the junction of the Volcano Road is soon reached; the latter appears to follow up a very smooth and even ridge, which is said to form the divide between the waters of the Cosumnes and Mokelumne rivers. The views obtained to the north are very grand; all the creeks falling to the American have broken up the country in the roughest possible manner, while beyond them Pyramid Peak towers aloft, forming a magnificent back ground to one of the most striking scenes on the road.

TRAGEDY SPRINGS, ALTITUDE 7,512 FEET.

Some three miles more brings us to Tragedy Springs, which are situated at the head of one of the branches of the Mokelumne River. Mr. Day and myself took bearings to the prominent points from the ridge above our camping ground, and in the evening we obtained observations for latitude. This place owes its name to a party of California Pioneers of the Volunteer Battalion, who were barbarously murdered here by the Indians in 1849; their graves are to the right of the road in descending the hill.

August 29. – While the train was packing this morning, Mr. Day and I again ascended the ridge and completed the observations commenced last evening. A fine view is obtained here to the north-east. Silver Lake lies more than 1,000 feet below, embosomed in white granite hills and fringed round with dark pines. On its east rises a lofty range of dark volcanic mountains, which forms the spur over the Carson Road passes, and which terminates to the north at the two remarkable thimble-looking obelisks of black rock, which are seen from so many points of the old road. On returning to camp, I obtained observations for time before starting.

Immediately on leaving camp, the road led us up a rather steep hill, from which a trail to the left makes a short cut across by Silver Lake to the lofty pass of the Carson Road, and saves a detour of several miles which the Wagon Road here makes. The distance across is said to be seven miles, while round by the road it is thirteen; this saving is however more than made up for in the extra descent and ascent on the trail. The Wagon Road, which we followed, continues to the south and descends into a valley of the Mokelumne, down which and over some pretty flats it continues for a mile to the south-west, passing several small sheets of water. This valley is confined on the eastern side by a rough and barren breccia range of cliffs, through a low gap in which the road passes over into another valley which stretches away to the south. The rock forming the bottoms of both these valleys is white granite. The breccia summit of the intervening ridge appears to be wholly superimposed on the granite. The road keeps up this valley at the foot of the breccia, and is for the most part good; at length crossing over to the eastern side, it ascends the ridge by a long but easy ascent. On reaching the summit, we found ourselves on a narrow divide, having a large open valley to our east, which appeared to contain a fine pasturage. In various places along the summit of this ridge fragments of breccia remain, but the greater portion of the ridge is of white granite. We had now attained an elevation of 8,200 feet, and were evidently fast approaching the summit. A strong, cold south-west wind depressed the barometer, as we continued to ascend, more than was due to the difference of altitude.

We passed over a breccia point of this ridge, which commanded a very extensive view of the mountains to the south-east. Two lofty, double headed peaks of the central

ridge of the Sierra lay to the east, the southern of which I recognized as that pointed out to me from near Walker's River in October, 1853, by my esteemed friend, the late lamented Major Ebbets, whose untimely end¹¹ has delayed the exploration of the pass discovered and named after him, and which, there is reason to believe is the lowest and most suitable one for the Pacific Railway in the central portion of California. This pass lies a little to the south of this Butte-like mountain, and is on the head waters of the main branch of the Mokelumne River. Major Ebbets, with a large prospecting party, had crossed it in the month of April, 1850 or 1851, and found it at that season free from snow, while the mountains on either side were totally impassable.

I recognized also several other well known peaks, one of which was a lofty castellated peak south of the Sonora and Walker River Immigrant Road named the Castle Peak, and whose position I had determined when on the Railway Exploration under Lieut. Moore, U. S. A., in 1853. I availed myself of the present opportunity of connecting the surveys together.

As we approached the pass the scenery becomes more grand and imposing. The ridge which the road follows is very narrow, and falls away precipitately on either side into deep cañons; those forming the heads of the North Fork of the Mokelumne are of white granite, and apparently totally impassable.

WEST PASS, ALTITUDE 9,036 FEET.

By 4 P. M. we reached the summit of the Great Carson Spur, which being the highest point on the Wagon Road, is generally called Carson Pass, although, in reality, it is not on the divide of the Sierra. This great spur is the range of dark volcanic rock seen from Tragedy Springs. It branches off from the main Sierra near the head of Hope Valley, and running south-west for four or five miles, turns abruptly at this point to the north-west, and terminates at the Thimbal Rocks, before named. It is composed of breccia, or volcanic scoria, having occasionally dykes, or domes, of compact lava, or basalt, in its mass. This rock forms a large portion of the summit ridge of the Sierra, from the Sonora to the Carson Pass, but as we shall see, reaches but a short distance north of the latter. Its cliffs, blackened by age and exposure, contrast finely with the brilliant white granite hills and valleys below, which are always dotted with pine, while the former are every where barren. Now is the contrast less striking in form, as well as in color, between these granite mountains, whose boulder-like masses are too much cut up with detail to allow them to form the same grand and majestic outlines exhibited by the breccia mountains, whose curved bases, precipitous sides and turreted escarpments, are crowned with castellated summits of gigantic proportions. Indeed, wherever this rock appears, it adds much to the wildness and grandeur of the scenery. The culminating point of the road was 9,036 feet above the level of the sea.

There was a conical peak of the mountain just above and to the east of the pass, from which I determined to take a sketch of the surrounding country; and it being already late, we determined to camp on the mountains for the night. Sending, therefore, the train forward to find a sheltered camping ground, Mr. Day and I ascended the mountains taking with us the theodolite and barometer. On the northern slope there was a patch of snow, the first we had seen. On reaching the summit, the wind was

¹¹ He was lost in the blowing up of the Secretary on his way to Petaluma, in May, 1854.

piercingly cold, and so strong as to make it difficult to take observations. The height of this peak was, by the aneroid, 318 feet above the pass, or 9,354 feet above the sea. In clear weather the view from the point would be very fine; but there was so much smoke on the lower hills that it was difficult to make out the distant objects. Monte Diablo loomed up in the extreme western horizon, while the White Mountains of Utah bounded the eastern. In the south, the Castle Peak of the Sierra could be seen, and to the north, nothing beyond Wasshoo Peak, to the north of Lake Bigler. At last we were fairly frozen out, and had to descend to the camp, which we found in a sheltered spot, near a fine stream, some 600 feet below the summit.

In the evening we obtained some indifferent observations for latitude.

CAMP 4. ALTITUDE, 8,736 FEET.

August 30. – After breakfast we sent the train forward to Clear Lake, which lay in the valley before us some four miles distant, while Mr. Dan and I ascended again to the peak, and completed the observations commenced the day before. In ascending the mountain I found a piece of petrified wood in the breccia formation, of which I procured a specimen.

On the summit the wind was blowing as cold as on previous ascent, though more from the south, and we came to the conclusion that it would not do, provided as we were, to attempt to camp on Round Top, and make that point our astronomical station. The wind would have kept the altitude and azimuth instrument in a continual tremble, which, with the cold at night, would have made our observations worthless. As there appeared to be a flat line in Clear Lake valley, on which we could measure a suitable base line, I determined to set up the instrument there, and connect it with the neighboring peaks by triangulation.

The road down to the valley is very rough; in some places it is almost impassable, and although it never could be made a good one, yet it might be a very much improved, and that at no very considerable expense.

CAMP. ASTRONOMICAL STATION 2, ALTITUDE 7,176 FEET.

The descent to the lake from our camp was 1,560 feet. We found our party on the eastern side. They received our announcement of camping in the valley, instead of on the summit of the Sierra, with great satisfaction. Choosing a spot from which I could see Round Top and some of the other well-defined peaks of the summit ridge, all the requisite preparations were made for setting up the instrument.

Clear Lake is about three-fourths of a mile long by a half a mile wide; it is situated in the center of a flat as large again, which has been in past times a portion of the lake. Its shore and bottom is composed of pebbles, but without any admixture of sand. A second lake lies to the west, which runs into it. Several large streams feed it on the south-eastern side. It forms the head of one of the largest branches of the South Fork of the American, which being the largest as well as most southern, should bear the name of South Fork in preference to any other. The lake is surrounded by an amphitheater of mountains, composed of the central ridge of the Sierra and the great spur already described. The bases of all these mountains are of granite, while their summits are breccia. Two remarkable masses of the latter rock stand forward on their

granite pedestals almost into the valley, and form highly picturesque objects in a spot where all is beautiful. The granite hills are clothed with pine to the base of the breccia; a few juniper give variety to the foliage, while willow and aspen adorn the streams and bottoms.

In the evening we obtained several good observations for latitude, with the sextant and theodolite.

August 31. – We were aroused this morning at an early hour by a thunder storm, which caught us very unprepared. The fly was immediately spread, and our things put under its shelter. By the middle of the day the sun came out again, and the clouds clearing off showed us the summits above white with snow. In a few hours, however, it had mostly disappeared. In the afternoon I set up the altitude and azimuth instrument. I remarked that the aneroid appeared to be little affected by the rain, whilst it appears to be much more depressed by wind.

Sept. 1. – The weather has been beautiful to-day. I adjusted the instrument, and in the evening I obtained a good azimuth of Polaris, and set the instrument on an approximate meridian. I obtained also a set of equal altitudes for time. I fixed up the mountain barometer to-day: at ten 'o clock in the morning to read 22.75 in. while the aneroid read 22.63 in. During the day the aneroid appeared more sensible to small changes in the atmosphere than the mercurial barometer. By half-past nine in the evening both instruments stood precisely the same, at 22.71 in. Unfortunately, this was the last observation I had with the mercurial barometer, as it was broken soon after. This was a cause of great regret to me, since I had no means left of checking the aneroid. Still one important comparison had been made, and that too at the highest astronomical station on the journey. Could I have had such another comparison in Carson or Bigler Lake Valley, I should have been perfectly satisfied. The faithfulness of the aneroid so far gave me confidence for the future.

Mr. Day has measured a base line in the valley, and been to the summit of Round Top and some of the other peaks taking observations and setting up flags.

Sept. 2. Sunday. – Walked some two miles down the valley. There were a number of currant bushes near the trail, some of which were loaded down with remarkably fine currants, nearly as large as gooseberries and fine flavored. Ferrel brought in some fine duck for dinner, which are in great abundance on the lake.

Sept. 3. – Took equal altitudes for time and completed several of the lake observations. In the evening, obtained observations to correct the position of the instrument, and adjusted it on the true meridian. Unfortunately, the telescope received a blow which again threw it out of adjustment and of its center. Of one thing you may be assured, that it is impossible to use the tent devoted to the protection of the instruments for other purposes, without endangering or at any rate delaying the work. Took some fresh observations on north and south stars to re-adjust the instrument.

Sept. 4. – Computed the new observations and again got the instrument on the meridian, and set stakes and flags on each side of the lake on the true meridian. Mr. Day had been engaged in re-measuring two base lines in the flat of the valley, and in triangulating from the stations to flags that he has had placed on Round Top, Red Mountain, the Elephant, etc. From each of these peaks he has also taken a complete set of observations on all the principal points around, and so covered the country with a complete network of triangles. They have all been taken with the theodolite, and afford

ample material for mapping in the country. To-day Mr. Day prolonged my meridian over the Round Top or central ridge of the Sierra, setting up large flags, which we were in hopes would be visible from the shores of Bigler Lake.

Sept. 5. – Rose early this morning to get a transit of the moon, which, however, I did not succeed in. it being now the moon's 23rd day, it passes the meridian by daylight, and I shall not be able to get an observation with the culminating stars. Thus the accident of the 3rd has lost us a day, at a time when we least could have spared it.

I had seen sufficient to know that the angle of the State boundary must be in Bigler Lake rather than Carson Valley. I therefore gave up the intention of taking the instruments there, and determined after completing the observations at our present camp to proceed to Bigler Lake Valley, and there set up the instrument as near the initial point as might be convenient.

As there would be no available observation for longitude before the 29th, with Mr. Day's advise I determined in the mean time to proceed to Carson Valley, lay in a fresh stock of provisions, and have the flags I required set up on Job's Peak and such other points as might be advisable.

Judge Hyde had left us a few days before for the valley, to be present at the opening of the U. S. District Court. When he left us, I had the intention of following him with the instruments in a few days, but from having obtained the conviction that Carson Valley lay beyond the State boundary line, I had altered my plans as already stated.

Mr. Day proposed remaining here until my return on the 9th, and in the mean time explore the route down the river. Taking with me Merkley, Dustin and Ferrel, with four of our animals, my compass, sextant, the small chronometer by Parkinson and Fordsham, the aneroid and thermometer, we left camp at about half-past two in the afternoon, for Cary's Mill.

Immediately on leaving the valley, our road lay up the ascent to Carson Pass proper. In rising the hill, a very fine view is obtained of Clear Lake Valley, with its two lakes and surrounding mountains. It is certainly the most imposing view on the road, and I believe is unsurpassed in wild beauty or grandeur by any in the State. The juniper grew in considerable numbers on this hill side. This tree is of a highly picturesque form, and is the more remarkable from being so seldom met with. It bears much resemblance to the yew in the contour of its branches and general appearance. On the Sonora and Walker's River Road, on the eastern side of the mountains, it is found in greater number, and I made an accurate drawing of it when I first met with it there.

CARSON PASS, ALTITUDE 7,972 FEET.

A large dark granite rock marks the summit of the old Carson Pass. It is of a fine grain, and quite different from that of the hills below, and appears to belong especially to the axis of the Sierra, for I remarked this same description of granite elsewhere, except as *nodes* in the white granite formation. The distance from Clear Lake Valley to this summit is about three miles, and altitude above the valley 797 feet; its height above the level of the sea 7,972 feet.

This appears to be the pass by which Col. Fremont entered California on the 20th of February, 1844, but instead of keeping down to Clear Lake Valley, he continued to ascend the ridge to the head of the Truckee, and thence continued along the Round Top Ridge for several miles, before descending a spur to the South Fork of the

American. It is at this point that the Sierra divides, throwing off to the north-east the chain of mountains that forms the western rim of Hope and Carson Valleys. Several of the peaks on this range being considerably higher than those on the True Divide, or Round Top Ridge, Col. Fremont concluded that they formed the axis, or summit ridge of the Sierra. Seeing a large lake to the west of this lofty chain, and an apparent gap in the ridge he was following on the south-west side of the lake, he naturally concluded that this lake ran into the American River. This gap I suspect is the one at the head of the Slippery Ford Creek, or possibly the depression of the ridge in the neighborhood of Johnson's Pass. The lake in Col. Fremont's map attached to his Report, is called Mountain Lake, and in the general map by Charles Preuss, Lake Bomplaud. It has since been named Lake Bigler, and as such is most generally known. An endeavor has lately been made to name it Truckee Lake, from its being on the head waters of that river, but as a lake lying to the north of the Truckee Pass has been known for many years under that name, it would be very unadvisable to disturb the present names.

From the old Carson Pass the road descends a most precipitous hill, certainly the worst and least easy of improvement on the road, in fact the whole ascent we have made for the last three miles, is on this side made in about half a mile; it is a complete falling-off place, and is of itself sufficient reason for the rejection of the Clear Lake route, for the intended Immigrant Wagon Road.

RED LAKE, ALTITUDE 7,247 FEET.

On a small bench of the hill below, and at the foot of Red Mountain, is a small marshy lake, apparently fast drying up. This is Red Lake. I could not see that it had an outlet, but in all probability it soaks through the narrow rim of white granite rocks that lie on the Hope Valley side.

HOPE VALLEY, ALTITUDE 6,535 FEET.

The road continues down the spurs forming the base of Red Mountain, crossing several small streams and little flats, until at length the large meadow flat of Hope Valley is reached, which is about four or five miles long by a mile and a half in width. Much of the rock of these spurs appear to be of an altered, schistose formation, or jasparoid rock. I saw this same rock, in a similar situation on the east flank of the summit ridge, south of the Sonora Pass. It does not appear to belong to the talcose slate, or gold-producing rocks of California, but rather to the quartz or schist, of the burr-stone description, which exists much higher up on the western flanks of the Sierra, and which is extensively developed in the upper portions of Tuolumne County.

The chronometers and aneroid being carried by a person on foot, we could not proceed very fast. I therefore sent Ferrel forward to the Mill to give notice that we were on the road.

HEAD OF CARSON CAÑON, ALTITUDE 6,488 FEET.

It was quite dust when we arrived at the head of the famed Carson Cañon, and we had not proceeded far before the overhanging cliffs and dark pines above our heads, involved us in total obscurity. The roughness of the road, too, warned us that we

had no easy task before us, in getting down this mountain chasm in the dark. Neither of us had traveled over this road before, so we had to trust pretty much to the mules, whose instinct generally keeps them right. We spent three of the longest hours in blundering down this place in the dark, and when at last we did emerge, the light of the stars was even dazzling to the eyes, so totally and painfully obscure had it been. A good supper, however, at Cary's soon set us to rights again.

CARY'S MILL, ALTITUDE 5,032 FEET.

The difference of altitude between Cary's and Hope Valley, at the top of the cañon was 1,456 feet by the aneroid; our height above the sea 5,032 feet. Since this period, Mr. Day, in prosecuting the Wagon Road Survey, has measured the difference of level between these two stations, and has made it within *one foot* the same as given above. This remarkable coincidence has increased my confidence in the aneroid, when used with care, but as its zero is very liable to be altered, it ought during a long journey to be checked from time to time with a mercurial barometer. Before retiring for the night, I obtained some good observations for latitude.

September 6. – Sent Ferrel back to Clear Lake camp with the requisite supplies. Took observations for rating the chronometer before starting down the valley.

Cary's Mill is about a mile from the foot of Carson Cañon, and is situated in a hollow formed by the spurs from the mountains on the west, which are well clothed with pine. The lumber produced on the east side of the mountain is very inferior to the sugar pine lumber of California. It is hard, and very full of knots, but no better being obtainable it is in large demand. The Mill is situated on the west fork of the Carson River, which rises at the upper end of Hope Valley, and descends through the cañon to Carson Valley.

The east fork of the Carson River, which is the largest stream, rises to the south of the valley, and is formed from several large affluents. It heads in the central ridge of the Sierra, near Ebbett's Pass. One of its forks appears to overlap Hope Valley. There is an Indian tribe settled upon it, who since the days of Fremont appear to have been uniformly friendly to the whites. They bear a high reputation for honesty amongst the inhabitants of Carson Valley.

On leaving Cary's, the road makes a considerable ascent over a spur of the mountain, which forms the western side of the valley. On the highest point of this spur, about two miles beyond Cary's, the barometer indicated a rise of 447 feet above the Mill. The whole of this portion of the valley is composed of ridges of pebbles, boulders and sand, overgrown with the wild sage or artemesia, and which slopes down from the base of the mountains to the river. The road winds along over these ridges, which have a most desert-like aspect.

The chain of mountains forming the western side of the Carson Valley, rise from two to four thousand feet above the valley, and although of white granite, and similar in general character, are not only divided into groups of deep ravines, but have certain individual peculiarities which makes them readily distinguishable. The first group, from Cary's to Thornington's, is well timbered with pine, and has some little grass, or vegetation, over most of its slopes, and appears now of a brown color. The second group, which is the loftiest, is known as Job's Peak; it is divided by deep ravines from its neighbors; it has no vegetation on it, and very few pines; the summit is a perfectly

naked cone of decaying white granite, and the whole mountain has a white, bare and sandy appearance. The middle group in this range is of similar character, more cut up, and not so grand in its outlines, but better timbered than Job's. From Daggett's to the Mormon Station, although the summit of the ridge is white granite, the flanks and foot hills on the Carson Valley side are mostly of a metamorphic rock, and have a brown earthy color, and are bare of trees. It is at the foot of a spur of this character that the hot springs are situated. Beyond this the hills have much the same character as the group first described, and are covered with some little vegetation.

From the point of the spur before mentioned, I took bearings to southern peaks and sketched the view. A lofty peak, in the neighborhood of Ebbett's Pass, lies some distance to the South. The eastern side of Carson Valley is bounded by several chains of lofty but entirely barren mountains, the very picture of desolation. The length of the upper valley, from Cary's to Clear Creek, is about thirty miles, and in its widest part it is perhaps twelve miles across. On its western side one of the forks of the Carson River flows, while the eastern or principal stream comes out from the foot hills on the southeastern side of the valley, and follows a generally north-western course, to its junction with the West Fork, near the Mormon Station. From thence the river flows to the north-east and passes between the hills to the lower valley, near Gold Cañon. A few cottonwood mark the course of the Eastern Fork across the valley bottom, but the west has very few trees on it except willow. Parallel with the latter are several sloughs, into which most of the streams from the western mountains flow.

The bottom of the valley is very marshy in places. The only part settled upon is the gentle sloping ground between the foot of the western mountains and the river, a large amount of which is fenced in. From Thorington's, houses are scattered along the road all the way down the valley, seldom above a mile apart.

DAGGETT'S, ALTITUDE 4,417 FEET.

We traveled along but slowly. On reaching Dr. Daggett's we received a hearty welcome, and he produced from his garden some very fine musk and water melons, which was a treat to us after our mountain fare.

MORMON STATION, ALTITUDE 4,337 FEET.

We arrived at the Mormon Station by supper time, where we were welcomed by Judge Hyde and Col. Reese.

The U. S. District Court had been opened by Judge Stiles, and the business already got through. The party were preparing for their return to Salt Lake City. My men, who had come out with them in the spring, wished very much to return, but Judge Hyde kept them to their duty.

Since I was here in 1853, a handsome grist mill has been erected, with a saw mill attached, which appears to do a thriving business. A court house has likewise been lately built, and several other improvements made. The small immigration of this season is however complained of by all the inhabitants of the valley.

After supper I obtained observations for latitude, but we had such a large crowd of lookers on, that it was rather difficult to get a good set.

Sept. 7. – A flag has been set on the highest peak above the Mormon Station, and Mr. Mott is to have one placed on the summit of Job's East Peak. I informed Judge Hyde that the principal part of the valley was on the Utah side of the line, although there was a little uncertainty as to the settlements in the upper part of the valley. He accordingly determined to issue the proclamation, calling for the election to take place at the Mormon Station, on the 20th of September.

I obtained equal altitudes of the sun for time, but lost the meridian observation. In the afternoon, accompanied by Judge Hyde, we started up the valley on our return. The fall, from Cary's Mill to the Mormon Station, was, by the barometer, 695 feet; the highest of the latter above the sea, 4,337 feet.

JOB'S.

At Job's Store the Judge procured us the supplies required, and parting company, he returned down the valley, while we continued up to Thorington's.

Night had already closed in upon us as we left Job's, and we had hardly proceeded a mile on the road, when the animals frightened at cattle in the sage bushes, took a stampede and scattered one of our packs, containing provisions, along the road. After an hour's delay, things were righted and we proceeded again, minus our coffee, shot and candles, which had been lost by the accident. The whole of the rest of the journey the animals were stiff-legged and were with difficulty got along at all; and we determined not to make any more right marches.

THORINGTON'S, ALTITUDE 4,729 FEET.

At length we arrived at Mr. Thorington's, or Lucky Bill's as he is generally called. Here we spent the night and found a good supper awaiting us, which was enlivened by the sallies of natural drollery for which our host is famed.

Sept. 8. – This morning I sent back Mr. Merkley to procure more coffee and shot in place of that lost last night. I sent Dartin forward with a flat to a hill in the center of the valley, near which I supposed the State boundary line would fall. I made some sketches and took bearings to most of the principal points around. After drinking with Lucky Bill, and thanking him for his hospitality, we resumed our journey.

CARY'S.

On arriving at Cary's mill, I left the small chronometer (Parkinson & Prodsham's) in his charge, intending to return to the point again – not wishing to subject the chronometer to more moving than I could help; I had confidence that he would not neglect the winding it regularly.

We then continued on about a mile to the first bridge at the mouth of the Carson Cañon, which we now had an opportunity to examine by daylight. It is a grand gorge or defile in the mountains, through which the west branch of Carson River falls above 1,200 feet in five miles. It is in some places very narrow, and is closed in on each side by lofty precipices. These mountains, which at some former period appear to have been rent asunder, are of white granite. At nearly the center of the cañon, on the summit of one of the cliffs, to the north, is a large mass of black rock of castellated

appearance, no doubt composed of the volcanic breccia so prevalent. This rock is, however, rather remarkably situated, and is the most northern specimen of breccia I have seen on the eastern range. On the summit of the mountains south of the road, are three smooth knolls of apparently the same rock, but there are not seen from the cañon. They form points of a smooth ridge which overlies the granite. This range of mountains forks off at Job's Peak and from the Carson chain, and running in a southerly direction pass Thorington's and Carson Cañon forms the eastern rim of Hope Valley, toward the southern end of which it sinks down into lateral spurs, and disappears as a ridge altogether.

On reaching Hope Valley, we camped for the night at the deserted log cabin at the head of the cañon. The barometer returned to the same height here which it had previously marked when we passed this place on our way to Carson Valley a few days earlier.

The appearance of Hope Valley indicates it to have been at one period a mountain lake, its smooth, gravelly bottom, with its beds of pebbles and boulders, and the beach-like formations round the slopes of its hills leave little doubt, on my mind, of its lake origin; a large portion of the flat even now is marshy, and in the wet season must be covered with water; indeed, in the map accompanying Fremont's Report, a lake is represented in this place. The pine around the sides of the mountains are of large size; hemlock and spruce is abundant, and also a handsome species of pine with red bark and wide-spreading foliage.

Sept. 9. – Wishing to obtain the height of Luther's Pass, in order to transmit it to you with the rest of the heights by Mr. Day, I determined to return to camp by way of this pass and Lake Valley instead of following the Wagon Road to Carson Pass. I was also glad of this opportunity to explore the upper portion of Bigler Lake Valley, which gives rise to the headwaters of the longest branch of the Truckee River. Apprehending that we might find it difficult to get the pack animals across, I sent the forward with Mr. Merkely by the road and took with me Mr. Dustin and the horse I rode, my compass, and the barometer and thermometer.

Luther's Pass lay directly across Hope Valley, to the west, and formed a low gap in the hills. We crossed the marshy flat to the foot of the Pass through which several small, sluggish streams flow; there is no direct water course or ravine from the pass, although the ground is springy over much of the ascent. We missed the trail and arrived on the summit of the pass at its southern side where it is a few feet lower than where the trail actually crosses. The height of this pass was, by the barometer, 696 feet above the flat of Hope Valley, while the old Carson Pass at the southern end of Hope Valley is 1,437 feet above the same point. This pass, in fact, is not as high as the bench at the foot of the steep ascend of the old pass, and why a road should not have been constructed over it before seems unaccountable. From the summit of this pass the ground slopes off into a large flat, having a shallow lake in its center, which finds an outlet at the western end of the flat where the hill breaks off and falls to Bigler Lake Valley. Seeing some indications of the trail at the northern side of the valley, we crossed over and found it winding round at the foot of the mountain. The descent from Marlette's Flat to Bigler Lake Valley was far greater than I expected to find it; we descended some 800 feet and the valley appeared to be about 400 feet lower still, but as the trail continued to wind round the base of the hill to the north-west, we followed it

no further. Striking across to the south-west, we passed with some difficulty the rocky creek which comes down from the lake above. The forest was so thick that it was difficult to see far ahead, but what we saw was not very inviting. The country toward Round Top had the roughest possible appearance. The stream of the Truckee, the main feeder of Bigler Lake, came down through apparently impracticable cañons, and I began to fear we had made a mistake in bringing the horse with us. We soon came to another creek which was difficult to cross, this proceeded from a valley to the south of and lying parallel with Luther's Pass; crossing there a sandy spur covered with large granite boulders, we came to a very steep, rocky hill which we next ascended, so as to see how to shape our course. From this point we saw that between us and the Round Top ridge there was a basin of naked, white granite rocks cut into deep cañons by the Truckee and its tributaries, and that it would be impossible for us to get across it with an animal. I saw also sufficient to give up all intention of prolonging the meridian line of Clear Lake Camp to Bigler Lake.

We now returned to the south up the ridge we had ascended, alternately climbing and descending, to avoid precipices and fallen pines, which blocked our progress in many places. After proceeding in this way for an hour longer, the country improved. We had got above the immediate brink where the upper valley fell away into Bigler Lake Valley. We crossed some small streams, and at length came on to a spur, covered with the gravel and debris of breccia rocks. Soon after we approached a lofty cliff of breccia, which, with its castellated summit, overhung a most romantic little lake, which we left on our left. The water was dark blue and appeared to be very deep; but we had no time to remain at this enchanting spot. After crossing some more rough granite hills, which bordered the lake on the west, we came out on a low granite sand ridge, in the center of the upper valley. This ridge was characterized by a fair growth of pine along it, while the rest of the valley on each side, as well as the surrounding mountains, were perfectly barren. I need hardly say that the latter were of the breccia formation. This small ridge is shown very correctly on Fremont's Map.

As we continued up this flat the mountains gradually narrowed in upon us. Red Mountain, with its lofty rocky summit, frowned above us on the left, while the central ridge of the Sierra, which divided us from Clear Lake Valley, lay to our right. There was some of the finest bunch grass I have seen, on our journey in this upper valley.

The breccia, of which the mountains were composed, cropped out in horizontal lines on both sides of the ridge, and formed vertical steps, to which the snow in many places adhered in large banks, which, in melting, hollowed out the soil from underneath, giving a singular cave and column-like appearance to these ledges, which I had been unable to account for, until I had seen how it was produced.

At length, passing over a small stream which descends from Red Mountain, we began the ascent of the mountain at the forks of the ridges, half an hour brought us to the summit, where there was a small pool on the very top of the divide, which forms the head waters of the Truckee. The barometer gave, as the height of this point, 8,250 feet above the level of the sea, being 1,080 feet above Clear Lake, and 2,378 feet above Bigler Lake. The view to the north is confined by the summits of the two ridges, to the valley of the Upper Truckee. I made a sketch and took what bearings I could from this point.

Here we again crossed the trail of Col. Fremont, who kept along on the summit of the ridge, leaving the valley we had ascended, to his right. To our south was the valley of Carson Pass, with the lofty range of breccia mountains beyond. The wind was very cold and we remained but a short time at this point, from which I took bearings to the principal peaks around.

We now descended the precipitous hill-side, to the south, and soon reached the old road, at about a mile to the west of Carson Pass. Proceeding onwards, in the course of an hour we reached our camp on Clear Lake, where we found Merkley had arrived some three hours before with the supplies, to the great relief of the party remaining at camp which had been reduced to living on squirrels and ground rats for the last day or two.

Although I had not pursued the track I had intended, in reaching camp, I had still gained the objects of the excursion. I had procured the approximate elevation of Luther's Pass, and had positively determined that our meridian could not be prolonged across the rough country which makes the middle portion of the Valley of the Upper Truckee. I had also been to its head, and sketched the general form of the upper portion of this great central valley. I had hastened back to camp to-day for the observations for longitude in the evening, but in getting there I was disappointed. The evening clouded up at the time I wanted it clear, and so they were lost.

Sept. 10. – Mr. Day was to have left us to-day, on his return to Sacramento, I therefore requested him to report to you the progress of the survey. He took a copy of the barometrical observations, as we had not the time here to work them out, and we exchanged some of our notes on the survey so far. In the afternoon Mr. Day rode over the Carson Pass to the head of Hope Valley, and made a partial exploration of the pass on the Calaveras route, but the time did not permit of much examination.

Sept. 11. – Been engaged plotting the chief lines of the triangulation, and computing some of the observations. Mr. Day left us this morning. In the evening I got transit observations, and an emersion of the first satellite of Jupiter, which agrees well with the longitude by chronometer.

Sept. 12. – Continued working up the triangulation. Obtained observations for time. In the evening I obtained emersions of the second and third satellites; that of the second was remarkably good. The resultant Lon. is $120^{\circ} 00' 09''$. The last observation was not so satisfactory. Indeed, frequently, there is a considerable interval between the first ray of light appearing and the satellite obtaining its full brilliancy. It is, therefore, difficult, if not impossible, to obtain the precise instant corresponding to the Greenwich observations. The observations for time have been so numerous, and the results obtained agreeing so nearly with the direct observations for longitude, leaves but little doubt but that the mean of our observations will give a nearly correct result. I desired, however, to obtain some lunar transits as soon as an opportunity offered, which would be about the 20th. In the meantime, therefore, I determined to proceed to Bigler Lake Valley, and set up the instrument at the nearest point I could to the initial point of the State Boundary, and connect the whole survey together by triangulation.

Sept. 13. – Broke up camp, and made our final exit from Clear Lake Valley. The block on which the instrument was placed will mark this station well, and besides which, the bearings on several peaks around will note the position, should the block be removed or destroyed.

During our stay here the men had built a raft and crossed the lake several times; it was from six to eight feet deep, and bears evident traces of filling up.

It was 11 A. M. before we were ready to start; we, therefore, determined to proceed only to Hope Valley to-day. We went by the road previously described, over Carson Pass, where the barometer read four-hundredths of an inch lower than last time, caused by an increase of sixteen degrees in the temperature; thus this instrument continues to work well. At the other points along the road, where I had taken the previous observation, it gave nearly similar results to-day.

Ferrel drove the buggy; in going down the bad hill Merkley held on behind, and it was thus got down in safety. We crossed the flat of Hope Valley and camped at the foot of Luther's Pass, at a small spring. Our provisions were again running short, or I would have preferred remaining in this valley a day or two, so as to have ascended Cary's Peak, on the east side of the valley, and completed this portion of the triangulation; as it was, I was obliged to proceed; composed, as my party was, of Volunteers, I had to give up many points in order to keep them at all together.

Sept. 14. – Went over Luther's Pass by the trail to Lake Valley. The road winds round Marlette's Flat at the southern base of the mountain. This is certainly a very fine pass. The descent, however, into Bigler Lake Valley, is difficult; there are numerous boulders, and the granite ledges are in many places bare; yet a good road can be got. The total descent, from the lower end of the flat to the valley bottom, is 1,186 feet by the barometer. We continued down the fine level bottom of the valley, passing and leaving to our left the trading post, now deserted, where the unsuspecting inmates were murdered in July last. At this cabin the Johnson Road turns up the hill and crosses the ridge. We continued along the flats to Smith's Station, likewise deserted. The house which formerly stood here has been burnt, like almost all the houses on the road. The elevation of this place is 5,958 feet above the sea by the aneroid; we are, therefore 1,218 feet lower here than we were at our camp in Clear Lake Valley. The appearance of the forest too, would also indicate a much lower elevation. From Round Top the ridge falls away very considerably to the Johnson Pass.

The whole of the hills in this neighborhood are composed entirely of white granite, the breccia has quite disappeared. We halted for a couple of hours at Smith's where I took observations and sketched in our route.

We now followed the Johnson Road, and crossing a small stream just past Smith's, we continued along a low ridge of granitic sand and pebbles, slightly elevated above the flats, and lying parallel with the base of the mountain. The whole country is so heavily timbered that we saw nothing of the lake and very little of the mountains; a large stream runs alongside of this ridge for several miles, at the base of the mountains, while the Truckee flows along on the northern side, winding through a large marshy flat which continues down to the lake. At about four miles from Smith's we arrived at the end of this singular ridge and crossed a large creek which falls into the Truckee, the road then winds along over spurs of the mountains to the east, crossing several smaller creeks, all of which empty into the Truckee. At length we reached the point to leave the road for the lake. We had been obliged thus to wind round the lake to avoid the swampy ground which forms its southern shore.

BIGLER LAKE.

Bigler Lake is a noble sheet of water, from fifteen to twenty miles in length by six to seven in width; we arrived at its shore at dusk, and camped at the point of timber which forms the eastern boundary of the swamps on the southern end of the lake.

Sept. 15. – I went along the beach of the lake to the mouth of the Truckee River; this beach is a strip of firm, solid ground inclosing the swampy flats. I selected a favorable site for our astronomical station, one from which Round Top and several of the other points on that ridge, as well as all the mountains surrounding the lake, could be seen. It was near the mouth of the river and sufficiently far from the timber to prevent its intercepting our view. I had a block cut and prepared for the instrument; in the forenoon I took a set of time observations, but the afternoon closed in cloudy and windy; sent Ferrel and Hancock down to Carson Valley for more provisions.

Sept. 16. – Had a raft made and floated the block half a mile along the lake shore to the place chosen yesterday. The tent was set up and the instrument put into adjustment; took an observation of Polaris at the eastern elongation, and set the instrument on an approximate meridian.

The party sent to Carson Valley for supplies returned to-day, bringing with them very little, and that so bad that it is hardly eatable; the flour is about half smut. They complain that they are entirely out of provisions in the valley.

Sept. 17. – Took observations for time. There are so many clouds on the hills that we cannot make out any of our flags, not even with the large telescope. The lofty peak of Job's Group visible from this camp turned out afterwards not to be the eastern peak on which my flag was erected. I set out and measured a base line of seventy-eight chains on the flat, and had a flag put up on the granite knob some three miles to the south which overlooks this portion of the valley.

Mr. Merkle went to Carson Valley to-day, as he is desirous of returning to California in search of his son, and thus I am all the time short of hands. The afternoon closed in with heavy rain and wind, and the men went off into the forest and built themselves a brush shanty; I remained at the tent but did not get any observations.

Sept. 18. – The mountains are white with snow, so there will be little chance of seeing any of our distant flags. Spent the morning in computing some of the recent observations. In the afternoon crossed the Truckee on our raft, and went to the point of timber on the western side of the flats, from which I took bearings to our tent and the flag on the granite knob as well as to all the points round the lake. In the evening I took transit observations on an approximate meridian; obtained also an emersion of the first satellite of Jupiter, which gives as the longitude of the camp, $119^{\circ} 56' 30''$, while by rate it should be Lon. $119^{\circ} 58' 15''$.

Sept. 19. – After taking a set of time observations I crossed the Truckee on our raft, and, accompanied by Dustin, went to my station on the granite knob, from which I took a complete set of bearings. This knob is an exceedingly rough white granite hill, or rather mass of rocks, standing in the center of the flats, connected, however, to the main ridge of the Sierra on the west, by a low, smooth and even ridge, that runs out in a north-easterly direction from the mountain, on the south of a low gap in the Sierra, which is certainly the lowest pass in these parts. I have not heard it spoken of under any name and believe it is unexplored; it leads over to the Slippery Ford branch of the South Fork, and unquestionably would be the pass most suitable for a railroad should

the height of this valley not be insurmountable; the pass cannot be 500 feet above the flats of Bigler Lake Valley. I would have liked much to have explored it. A fine view of the lake is obtained from this station. The lake is entirely closed in with mountains, and it is impossible to detect the opening by which the Truckee River flows from it. Indeed, no one I have spoken to on the subject has been able to give me any exact information in relation to it, and some even have expressed a doubt as to whether the lake has an outlet at all! The mountains on the north-western shore gives some indication that there might be a passage that way.

Since my return from the mountains I have understood that there is a road from Yankee Jim's, which crosses the Truckee River on the north-western side of Bigler Lake, and then follows the river up to the lake, round the north end of which it winds, and then crosses over into Washoo Valley. There are others, also, who state that there is an outlet from Bigler Lake to Washoo Valley. If such is the case, certainly a route could be obtained, which would offer an easy grade to the plains. These mountains ought to be properly explored, as from their peculiar character they are cut up by numerous passes, some one of which may serve for the great Pacific Railroad. The lake, I suspect, is very deep in the center, as there is a well defined line of deep blue stretching out from a point on the eastern side, towards the mouth of the Upper Truckee. It would be interesting to ascertain the depth of the lake, lying as it does at an elevation of nearly 1,500 feet above Carson Valley, and separated from it only by a narrow ridge of extremely friable white granite mountains, which are wearing away with considerable rapidity (geologically speaking).

A dense forest spreads out from this point of our observations in every direction, except along the swampy flats before mentioned. The ground in many places is literally covered with strawberry vines, or sun-flowers. The whole bed of this valley is composed of granite sand, and banks of pebbles, which in many cases appear sorted by the action of water. We returned to camp late in the afternoon. At the mouth of the Upper Truckee, the stream is about fifty feet wide, with a depth of from two to six feet. It runs very slowly, and in some places has very deep pools. It, as well as the lake, is well stocked with trout. This was not, however, the season, and we did not procure any. There were plenty of wild duck, mud hens and sand-hill cranes. We did not succeed in shooting any of the latter, but the camp was pretty well supplied with duck while our shot lasted.

In the evening I obtained an emersion of the third satellite, which gave our longitude as $119^{\circ} 58'$.

September 20. – To-day being election day in Carson Valley, Dustin and Hancock both went down to vote, and join in the festivities on the occasion of the first election in Carson County. I obtained a set of equal altitudes for time to-day, and from the south end of my base line I took bearings to all the other points visible. In the evening I obtained a transit observation of the moon and zeta and beta sagittarii. It seems that something, however, is always to prevent our getting successful observations. Merkley, in moving round the tent, struck the telescope in the interval between the passage of zeta sagittarii and the moon. The instrument was of course slightly displaced, and the result was, that between the passage of the preceding star and the following star, there was an excess in the observed time, amounting to seven and a half seconds; allowing that this was caused by the blow, and deducting that

amount from the observed interval between the transit of the first star and that of the moon's bright limb, the result would give our longitude at $119^{\circ} 59' 48''$. Very shortly after, the evening clouded up, and I was unable to obtain any observations to replace the instrument on the meridian.

September 21. – Rode to-day to the summit of Daggett's Pass with Merkley; when near the summit we met Dustin and Hancock returning from the valley. The Mormon party have been elected by a large majority. The Mormon Station has been chosen the County Seat, which is to be named Genoa, after the birthplace of Columbus. I set up a flag on the summit of a rocky eminence, a little to the south of the pass. From this point our tent on the lake, the flag on Job's Peak, and the flat of Carson Valley were visible, as well as Pyramid Peak, and several other points already fixed by triangulation. I sent Hancock down to the valley to put up flags in positions I pointed out, determining to make this the connecting point of the triangulations of Bigler Lake and Carson Valleys. After making a sketch, I returned to camp. On our way we followed round the shore of the lake, to its extreme eastern bend, from whence I took bearings to our tent and all the other points.

I was disappointed in the evening in getting a lunar transit. The weather had become very bad, and the sky entirely clouded. Our camp was again out of provisions, and the party much disorganized. When Mr. Day left me in Clear Lake Valley, he had promised to either write to me by the 18th, or to return himself. Up to this time I have received no intelligence whatever of the decision of the Wagon Road Commissioners, and their silence induced me to believe that the work had been abandoned. I had arranged with Mr. Day that I would remain in Bigler Valley until I saw or heard from him, but I now found myself placed in a position that I could remain here no longer. Mr. Ferrel stated that Mr. Day had told him that in case he did not return by the 20th, he was to bring back the buggy to Placerville. Of this I had heard nothing before. He now told me he was determined to return on the following day. Merkley also resolved to accompany him, and being, as I stated, entirely out of provisions, and the rest of the men unwilling to remain longer in the mountains, I reluctantly consented to remove camp the next day to Carson Valley.

The continued bad weather had prevented my getting the observations I most wanted at this camp; still, considering the means I had at my disposal, the result of the survey had been satisfactory, and its main object attained. The position now of the boundary line between El Dorado County and Carson Valley, was determined within a very small amount of error, and it only remained to carry that line over the mountains, to see exactly where it would fall in the valley.

Previous to doing this, however, the observations had to be re-computed with the corrected results already obtained; and on that being done, a monument should be erected at the point where the boundary line leaves the Lake, and a station fixed in line therewith on the summit of the ridge above Carson Valley. At this, however, could not be done before the office work required in the first instance was completed, I concluded that it would answer all present purposes to connect Carson Valley with the survey, and locate the several settlements there, so that when the map of the entire work was completed, the boundary line could be drawn thereon with accuracy, leaving the tracing it off on the ground to a future occasion.

The latitude and longitude of this camp by a mean of our best observations is, Lat. $38^{\circ} 57' 01''$; Lon. $119^{\circ} 58' 02''$, and its altitude above the level of the sea, 5,850 feet. The initial point found by the intersection of the thirty-ninth parallel with the 120^{th} meridian, is, therefore, four miles distant from the camp, on an azimuth of $30^{\circ} 30'$ west of true north. Assuming the longitude given by Captain L. Sitgreaves, U. S. Topographical Engineer, of the point where the Colorado crosses the thirty-fifth parallel, as $114^{\circ} 40'$, the boundary line will form part of a great circle, uniting these two points; and at the thirty-ninth parallel and 120^{th} meridian, the line will make a spherical angle with the meridian of S. $48^{\circ} 25' 55''$ E., and at the junction of the 114^{th} , 40^{th} meridian and thirty-fifth parallel of N. $45^{\circ} 13' 5''$ W.

Sept. 22. – This morning broke up camp in Bigler Lake Valley. Ferrel and Merkley returning with the buggy, taking the altitude and azimuth instrument, and such other things as we should not again require, while I left with Dustin for Carson Valley. The station here is marked by the instrument block, and can readily be found by the bearings taken to the different natural objects around.

DAGGETT'S PASS, ALTITUDE 6,824 FEET.

We traveled over the ground of yesterday to the summit of Daggett's Pass, which was 974 feet above our camp on the lake, and 941 feet above the junction of the Wagon Road and trail, at the foot of the pass. Leaving Dustin with the animals on the summit, I ascended to the station chosen yesterday, and took bearings to all the noted points, and sketched in the view to assist me in mapping the work.

The flags I had sent Hancock to set up in the valley were not placed, however, in the positions I had directed, and I was unable to make them out. Leaving a very large flag on this station, I returned to the pass, where Hancock had already arrived, but it was too late to ascend the point again to have the positions of the flags pointed out. A heavy rain storm was hanging over Job's Peak, and a portion of Carson Valley, making objects very indistinct. Descending to the valley, the barometer made the height of this pass above Daggett's, 2,407 feet; the distance is under four miles; the trail is in some places very precipitous, and winds along the steep sides of the mountain, where a false step would precipitate one into the rocky cañon 500 feet below.

MORMON STATION.

The weather looked very threatening, so I hastened on to the Mormon Station. Judge Hyde was glad to find we had so nearly got through with the work, and did not wish more done than absolutely requisite. The evening came out very fair, making me regret that I had left our lake station, as I should have got a good observation of the moon had I remained there. I obtained observation for latitude, which gave $39^{\circ} 00' 20''$. I obtained, also, a lunar observation. Our longitude, by computation, is $119^{\circ} 49' 53''$, and height above the level of the sea, 4,337 feet.

Sept. 23. – Sunday brought a day's rest for the men, though not much for me. In the morning I walked down to the bridge over Carson River, just below the forks, with Judge Hyde, and took bearings to locate this point. I had a flag set here. I arranged with the Judge that I would go up the valley the following day, measure the line between my flags in the valley as a base, and complete my survey at the station near

Thorington's Ranch, instead of continuing it and closing on Cary's Peak, which I had wished to do; but as the Judge could only promise me the men for three days longer, I had to make the best I could of it. I obtained observations for time, and computed some of those lately taken.

In the evening there was a remarkably beautiful sun-set. A long, narrow streak of clouds, stretching from the northern to the southern horizon, formed, at a considerable height in the atmosphere, parallel with, and above, the eastern range of the Sierra Nevada. Light, misty clouds, which came up with a westerly wind, stopped on this cloud-bank, which remained stationary for half the night. It retained the brilliant hues of the sun-set for a considerable time, and kept its position in the heavens until it had entirely dispersed, or evaporated. It seemed to be the harbinger of fine weather, for from this time the rain-clouds disappeared, and we had another week of summer weather. After it dispersed, the barometer rose about a tenth of an inch.

Sept. 24. – This morning, before starting up the valley, I had some difficulty with the men about their returning with me to Placerville, but on my appealing to Judge Hyde, he settled the matter by saying, that the promises he had made, should be fulfilled, although the survey had taken much more time than he had anticipated.

During the period we had been in Bigler Lake Valley, Mr. Jones, U. S. Deputy Surveyor, was in the upper portion of Carson Valley, engaged in extending the second standard parallel of the U. S. Land Survey across the mountains, partly by measurement and partly by triangulation. I had been in hopes of seeing Mr. Jones before I left the valley, and of being able to connect my work with his.

In going up the valley this morning I met Col. Reese returning from Thorington's, from whom I learned that Mr. Jones and his party had already started on their return to California. He gave me a memorandum which Mr. Jones had left for me, describing the position of the last stake he had set in Carson Valley.

I took bearings to locate the point of the spur near the Hot Springs, and also stopped at Daggett's and other places on the road, for the same purpose. We arrived at Mr. Mott's at noon. I determined to avail myself of his former invitation and remain at his house for the night. In the afternoon I went down to my flag station in the valley bottom, from which I set out and partly measured a base line of two miles, and took a complete set of bearings to the different houses, surrounding mountain peaks and stations. The base line was laid out in range with the western summit of the hill at the head of the valley, where I had had a flag placed, but which, from the smoke in the distance, I could not discern. The bearing of the base line was 28° S. 5' E. by compass. From this station I saw the two lofty peaks of Job's Group, seen from our camp on Bigler Lake. Evening closed upon us before I could finish measuring the line; and our animals having wandered off some distance, it was very late before we got back to Mott's.

Sept. 25. – This morning I finished measuring the base; took observations from its southern end, as well as from a point further to the east of it, from which I could see the upper peaks of Job's Group, before spoken of. This base line commences near the forks of the Carson River, in the flat between the two branches, and runs up for two miles to a deep bend the West Fork makes. Large stakes were driven into the ground at the flags. On completing this work we returned to Mr. Mott's.

In the afternoon we went up the valley to Thorington's, accompanied by Mr. Mott, who gave me the names of the owners of the several ranches we passed; all of which appeared to be in flourishing condition. On arriving at Thorington's we found that he had left on a visit to California. Mrs. Thorington, however, made us welcome.

Sept. 26. – Sent Hancock on to Cary's Mill this morning, after the chronometer we had left there when last in the valley. I took Dustin with me to the station flag at the head of the valley. We crossed a deeply furrowed sage plain, which sloped from the mountains from West Fork of Carson River. The whole of this bottom, as previously mentioned, is composed of boulders, gravel and sand. We found the bed of the river very rocky and rather difficult to cross. Immediately on crossing we commenced the ascent of our station hill, leaving our horses at the foot. This hill is unlike all on the opposite side of the river; it is of a volcanic rock, of columnar form. Its sides are exceedingly rough and entirely covered with broken angular fragments of rock, more or less weather-worn. The hill cannot be less than 400 feet above the river. On arriving at its highest point I found that the west summit was somewhat lower than the east, where our flag had been placed, but as the base line had been laid out for the former, I removed the flag to this point, which intersected with our line, and at 28 N. 5 W. From this station I made a sketch of the surrounding mountains and of the valley generally, and took bearings to all noted points. This hill is very near to the State boundary line. It stands isolated, although apparently belonging to a range of low hills which stretch out from the direction of Cary's Peak, along the east side of this fork of the river. Their general form is rounded and water-worn, but they are all of volcanic rock. I was unable, however, to ascertain whether this rock was an overlying one, or a dyke in the bed rock of the valley.

On returning to Thorington's I found Judge Hyde and Mr. Mott, who were anxious to know the position of the State boundary. Of course, before the observations were computed and the work completed, I could only give a general opinion. I stated that I suspected the line would cross the valley in the immediate neighborhood of Mr. Thorington's house; that I believed the house was on the Utah side of the line, but I would not be quite certain.

Hancock had returned from Cary's mill with the chronometer, which had been regularly attended to while there. I wanted, as stated before, to have ascended Cary's peak, and taken observations to the points of the Clear Lake triangulation, but under the circumstances this had to be given up. In the afternoon, having nothing to detain us, we bid adieu to Mrs. Thorington, and returned down the valley.

Many were the inquiries made of us as we proceeded, as to where the boundary fell, and I was glad to perceive that the result appeared to give general satisfaction. Indeed, falling as this line does, diagonally across the mountains, thence down a spur, and crossing at the bend of the valley, it does not cut up or divide any of the valuable property. From all I have been able to learn, the general opinion seems to be that the ranches would sell at higher prices in Utah, than if they had been in such an isolated portion of California. The ranch of Mr. Thorington's is one of the finest in the valley; he has about 600 acres of land fenced, most of which is under cultivation; a large stable, a dwelling house, and several small buildings. Old's and Willams' ranches follow. Mr. Wm. Cary has a small ranch, which has been lately fenced. At Job's, where the principal stone in the valley is located, there are several houses, some of which display

taste and neatness. The farming establishment of Mr. Mott and his sons, surpasses all the rest, not only in size, and the amount of land under cultivation, but in its valuable improvements, and in the large amount of stock. The dwelling-house, which is the best in the valley, is a comfortable log farm house, in which all the substantial comforts of life are to be found, and where Mr. Mott and his wife, surrounded with their sons, daughters and grand-children, lead a truly patriarchal life.

On arriving at this ranch I accepted Mr. Mott's invitation to remain with him until I left the valley; and it being arranged that we should start on our return journey on the 28th, Dustin, and Hancock continued on to the Mormon Station with the Judge, to make the necessary preparations.

Sept. 27. – Engaged the whole day in plotting out the main lines of the Carson Valley triangulation. In the evening I obtained a good observation of Polaris, which makes our Lat. 38° 56' 46".

Sept. 28. – At an early hour this morning Dustin and Hancock had everything prepared, and we took leave of our hospitable hosts. Judge Hyde met us at Dr. Daggett's, and wishing us a pleasant journey, we started on our return.

On reaching the summit of Daggett's Pass, the aneroid read nearly the same figure as before, allowing for the change between a windy, cloudy day, and a bright one.

We descended to the Wagon Road, along which we continued to Smith's Station. As this road has been already fully described, I shall not dwell upon it now. We came to the foot of Johnson's Pass at a little before 5 P. M., and in half an hour were at the summit of the divide; the barometer making the height of the pass from its foot, 782 feet. I estimated that from the place where I took the lower reading to the valley bottom, might be fifty feet, but it is possible that it may be more.

JOHNSON'S PASS, ALTITUDE 6,752 FEET.

The height of this pass above the level of sea, is 6,752 feet. It is, therefore, 425 feet below Clear Lake Valley, on the old road. Incredible as this result is, I have no reason to doubt it, the barometer having been tested at Clear Lake Valley, and since that time it has apparently worked correctly. The luxuriance of the forest in Bigler Lake Valley is an evidence that its altitude cannot be as great as has been usually imagined. The timber in the valley belongs to an altitude of not above 5,500 feet on the California side. It is probable that the climate is ameliorated by the large expanse of water in Bigler Lake, which is never frozen in the winter. The Johnson Pass is the lowest of any of the central passes yet examined, and as such, most fitted for a winter road. The pass before alluded to, lying some three or four miles north of this, although apparently of less elevation, does not appear to offer as great facilities for a Wagon Road; it does not enter the Bigler Lake Valley at as convenient a point. At about a mile to the south of the Johnson Pass there is another depression in the ridge, over which Mr. Henderson, County Surveyor of El Dorado, proposed locating the road. It has since been adopted by Mr. Day for the new Immigrant Wagon Road, and is, I understand, somewhat lower than the Johnson. After having attained the summit of the divide the present road rises a little on the ridge before it descends into the valley of the South Fork of the American. About a mile below the pass we camped for the night on a flat which at some seasons I suspect is overflowed. The barometer made us 279 feet from the pass, and an altitude of 6,473 feet above the sea.

Sept. 29. – Our animals not being tied up last night, wandered off, causing us to lose more than half the day in searching for them. In the afternoon they were brought in by an immigrant party, who had found them on the road half way back to the Mormon Station, who, believing they belonged to a party ahead, had brought them on. We did not resume our journey until 3 P. M. On leaving this camp the country falls away abruptly; several small streams come in from the south. Four miles' travel over a rapidly descending country brought us to the brink of the hill above Slippery Ford Creek, which is one of the worst parts of this road. This hill is mostly composed of ledges of naked granite, which crop out in the form of large, sloping steps, which in many places are broken off into immense boulders. The hill is covered by a growth of chaparral on the sandy places. The Slippery Ford Creek is the most northern branch of the South Fork, and drains the mountains from Pyramid Peak to the main summit, which form a grand amphitheater around its head waters. There is no spot on the road more strikingly wild. It is a naked basin of white granite rocks. On the south side of the river is a lofty cliff of dark granite, which contrasts finely in color and abruptness of form with the neighboring mountains.

SLIPPERY FORD, ALTITUDE 5,358 FEET.

At Slippery Ford Cabin the barometer made our altitude 5,358 feet, and the descent from the boulder hill 492 feet. We continued down the South Fork about a mile, to where we found some grass, and camped for the night; altitude by barometer, 5,136 feet.

September 30. – Made an early start; kept to the Wagon Road, which continues to wind up and down over several of the spurs of the mountains on the north side of the river for five miles below Slippery Ford. The barometer at this point marked 4,901 feet.

The road here winds up to the summit of the ridge, near to which is the small flat of Silver Creek Ranch; we had ascended 1,376 feet in the last two miles. The summit of the divide is about 100 feet higher than the ranch. Its level above the sea is 6,277 feet, being more than 300 feet above Bigler Lake Valley. This elevation accounts for the large amounts of snow on this ridge in the winter. It is formed by a spur from Pyramid Peak; on the north is the valley of Silver Creek, in which there are some large flats, and where much stock is ranched during the summer. The road now continues along the ridge, to Peavine Hill, from which a very extensive view is obtained; the elevation of this hill is 6,410 feet above the sea. From this point the ridge branches out, and falls away considerably. The road descends precipitously for above 800 feet, to the point where the trail from the river meets it. From here it continues along a gradually descending ridge, passing Brockliss' trading post. This is one of the finest portions of the road, yet the descent from the foot of Peavine Hill to the point of the ridge, a distance of about ten miles, is 1,554 feet.

BARTLETT'S BRIDGE, ALTITUDE 2,532 FEET.

The road now descends from the ridge to the river at Bartlett's Bridge, which is now kept by Mr. Rodgers. The distance from the summit is called three miles, the descent 1,510 feet; we had reduced our altitude here to 2,532 feet above the level of the sea.

On my arrival I was informed that Mr. Day was expected the next day, and that the South Fork route had been adopted by the Commissioners, and that this survey was to be immediately commenced. We remained here for the night. Mr. Rodgers had spent a fortnight in Bigler Lake Valley, in the early part of the summer, and gave me some information respecting parts of the valley I had not visited, but he knew nothing of the north portion of the lake, or where the Truckee flowed from it. He informed me that he had seen no indication whatever of the lake having an outlet.

October 1. – Made an early start by ascending the hills to the junction of the old Carson and Johnson roads. The height given by the barometer was 1,410 feet rise. This spot, as was before stated, is 3,942 feet above the level of the sea. The barometer did not return quite to me the same height shown here formerly; still, the difference was such as is within that of the atmospheric changes. As I had previously stated, the aneroid seems more sensitive to these changes than the mercurial barometer. It is possible, however, that the zero may have been slightly altered in this return journey, for I had carried it slung over my shoulder riding, while in the outward journey it had been carried principally by hand, and never on horseback.

PLACERVILLE.

We proceeded along our former traveled road, passing the Sportsman's Hall and Hawley's, and arriving at Placerville by noon, where I had the pleasure of meeting Mr. Day and yourself, and reporting personally the results of the survey, which a few days afterwards, at your request I embodied in a communication dated October 5, 1855.

In comparing the merits of the several routes proposed for the Immigrant Wagon Road, I will observe that the old Carson Road may be characterized as a ridge road. It keeps for the most part on the summits of the divides, and makes few descents, until it reaches its culminating point. For the greater portion of its length, it is a good natural road, of easy grades, and although it is eighteen miles longer than the Johnson, it has generally been preferred by immigrants, as being better provided with grass and water. The very difficult and precipitous portions of the road have already been pointed out. The route examined by Dr. Bradley would be free from many of the objections that could be urged against the old road, yet its general elevation would be greater, and its distance longer than that of the adopted road. The Johnson Road, as at present traveled, has several extremely precipitous hills. The ascent to the ridge on the north side of the South Fork of the American, is very objectionable, not only from the unnecessary hills it traverses, but also from its great elevation. The road as adopted by the Commissioners, follows the valley of the South Fork, up to Slippery Ford, on the southern exposed slopes, and changes an altitude of from 4,000 to 6,500 feet, for one from 2,500 to 4,500 feet. The culminating point of this road, at Luther's Pass, is 1,800 feet below that of the old Carson Pass, while Johnson's Pass is 400 feet lower still. The old Carson Road has thirty-two miles, at an elevation of from 7,000 to 9,000 feet above the level of the sea, while the adopted road has only three miles; the latter, at its highest point, does not exceed 7,200 feet, while the former 9,036 feet. From the profile it will be seen that the adopted road throughout its entire distance, is at least 1,500 feet below the old Carson Road, and from 500 to 1,000 feet below the Bradley Cut-off. For the more readily comparing number of miles at corresponding elevations on each of the roads, from their junction fifteen miles above Placerville, to Cary's Mill in Carson Valley;

the time that snow remains on the ground is of course only to be considered as approximate.

Snow remains on the ground.	Hight above the Sea Level.	Road Adopted.	Johnson's Road.	Old Carson Road.	Bradley's Cut-Off.
	feet.	miles.	miles.	miles.	miles.
During year, 1 month	2,000 to 3,000	6	2		
" , 2 months.....	3,000 to 4,000	13	4	6	6
" , 3 months.....	4,000 to 5,000	10	7	7	8
" , 4 months.....	5,000 to 6,000	9	14	10	16
" , 6 months.....	6,000 to 7,000	11	22	13	22
" , 8 months.....	7,000 to 8,000	3	3	24	9
" , 8 to 9 months.....	8,000 to 9,000			8	
	Above 9,000			1	

The above table shows conclusively that the greater portion of the journey by the adopted road, will be traveled at a comparatively low elevation. It must be borne in mind that the average duration and depth of snow on the ground, on the two latter roads is far more; not alone from the greater elevation, but from the vicinity of the very lofty peaks that surrounds the old Carson Passes. The Bradley route being also on the northern slope of the ridge, will, during a considerable portion of the year, be little benefited by the sun's direct rays, and cannot, therefore, be considered as a favorable locality for a winter road.

The following tables form portions of this report, in which the several results of the survey will be found in their appropriate place.

- TABLE 1. Table of Geographical Positions, Latitudes and Longitudes.
- " 2. Table of Distances and Altitudes on the old Carson and Johnson Roads, with notes thereon.
- " 3. Table of Comparative Hights on above routes, arranged in the order of their altitudes.
- " 4. Table of Approximate Distances and Altitudes on the Walker's River and Sonora Immigrant Road, from observations made in 1853.
- " 5. Table of the Meteorological Observations made during the journey.
- " 6. Barometrical Register for the months of August and September, 1855, kept at Sacramento, furnished by Dr. Logan.
- " 7. Barometrical Register for the month of August, kept at Coloma, by Dr. W. Zelnar.
- " 8. Triangulation Tables.
- " 9. List of Flowers.
- " 10. Astronomical Observations, with introductory notes thereon.

Accompanying this Report I beg leave to hand you the following maps and sections:

- 1st. A Topographical Map of the country embraced in the survey, showing the boundary line between the State of California and the Territory of Utah, from the

intersection of the 120th meridian and 39th parallel, as far as surveyed on a scale of two miles to the inch.

2nd. Map of the Lines of the Triangulation.

3rd. Section, showing the Profiles of the old Carson and Johnson Roads, drawn on a horizontal scale of four miles, and a vertical one of 600 feet to the inch, having also profiles of the same drawn underneath, to equal scales of four miles to the inch.

All of which is respectfully submitted,

By your most obedient servant,

GEORGE H. GODDARD.

TABLE OF GEOGRAPHICAL POSITIONS – LATITUDES

PLACE.	Date of Observa'n.	Latitude.		REMARKS.
		Results.	Adopted.	
Monte Diablo, Meridian.....		37 53 04.5	37 53 04.5	Determined by U. S. C. S.
Sacramento, Sur. Gen'ls Office...		38 34 41.5	38 34 41.5	By connect'n with U. S. L. S.
PLACERVILLE, Astro. Station 1.		38 43 32.3	38 43 32.3	Final results not fully com'd.
Hawley's.....	Aug. 26.	38 44 40	38 44 40	Approximate.
Camp Springs.....	" 27.	38 42 23	38 42 23	"
Tragedy Springs.....	" 28.	38 39 34	38 39 34	"
Carson Camp.....	" 29.	38 38 20	38 38 20	"
CLEAR LAKE, Astro. Station 2...	" 30.	38 42 09.8		Mean of Observations.
" "	Sept. 2.	38 41 46.5		Transit 12 stars.
" "	" 3.	38 42 15.1		Mean of 10 Transit Observa.
" "	" 4.	38 42 13.3		" 6 "
" "	" 9.	38 42 49.2		" 9 "
" "	" 11.	38 42 17.7		" 7 "
			38 42 23.8	" 65 Observations.
Cary's Mill, Carson Valley.....	" 5.		38 47 02.5	Approximate.
Genoa, Mormon Station.....	" 6.			"
" "	" 22.	39 00 02	39 00 02	"
BIGLER LAKE, Astro. Station 3..	" 16.	38 57 06.1		Mean of Transit Observation.
" "	" 18.	38 57 13.2		" "
" "	" 20.	38 57 01.1		Mean of 10 Transit Obser's.
" "	" 21.	38 56 20.6		" Sextant "
			38 57 01.1	Mean of – Observations.
Mott's Ranch, Carson Valley.....	" 27.	38 56 45.8	38 56 45.8	Approximate.
Pyramid Peak.....			38 51 15	By Triangulation.
Round Top.....			38 44 48	" "
Cary's Peak.....			38 44 50	
Job's East Peak.....			38 52 05	
Highest Peak of Group.....			38 52 22	
Old Carson Pass.....			38 42 15	
Highest Summit.....			38 39 30	West Pass.
Johnson's Pass.....			38 50 20	
Luther's Pass.....			38 48 18	
Daggett's Pass.....			38 59 15	
Smith's Station.....			38 52 33	Bigler Lake Valley.
Slippery Ford.....				On S. Fork, Am. River.
Bartlett's Bridge.....			38 47 40	Over " "

TABLE OF GEOGRAPHICAL POSITIONS – LONGITUDES.

PLACE.	Date of Observa'n.	Latitude.		REMARKS.
		Results.	Adopted.	
		° ' "	° ' "	
Monte Diablo, Meridian.....			121 54 01.2	Determined by U. S. C. S.
Sacramento.....			121 27 43.7	By connect'n with U. S. L. S.
PLACERVILLE, Astro. Station 1.	Aug. 17.	120 47 01.5		First Satellite Jupiter.
“ “	“ 19.	120 45 01		“ “
“ “	“ 23.	120 46 43		By Telegraph, from S. Fran.
			120 46 22.9	By U. S. L. S., corrected.
Hawley's.....			120 38 29	By connection, approximate.
Camp Springs.....			120 19 18	“ “
Tragedy Springs.....			120 06 25	“ “
Carson Camp.....			120 00 00	“ “
CLEAR LAKE, Astro. Station 2...	Sept. 11.	120 00 25.5		By rate, chronometer.
“ “	“ “	120 00 37		First Satellite Jupiter
“ “	“ 12.	120 00 08.7		Second “ best
“ “	“ “	119 58 27		Third “
“ “	“ “	120 00 06.4		By rate.
			120 00 08.7	By best Observations.
BIGLER LAKE, Astro. Station 3..	“ 18.	119 58 15		By rate.
“ “	“ “	119 56 30		First Satellite Jupiter.
“ “	“ 19.	119 58 00		Third “
“ “	“ 20.	119 59 48		Lunar Transit, imperfect.
			119 58 08.2	By mean of Observations.
Cary's Mill.....			119 47 22	
Genoa.....			119 48 25	Mormon Station.
Mott's Ranch.....			119 48 05	
Pyramid Peak.....			120 07 24	
Round Top.....			120 00 40	
Cary's Peak.....			119 50 06	
Job's East Peak.....			119 49 35	
Highest Peak, Job's Group.....			119 50 50	
Old Carson Pass.....			119 56 48	
Highest Summit, Old Road.....			120 00 00	West Pass.
Johnson's Pass.....			119 59 16	
Luther's Pass.....			119 55 00	
Daggett's Pass.....			119 50 40	
Smith's Station.....			119 58 14	Bigler Lake Valley.
Slippery Ford.....				On S. Fork, Am. River.
Bartlett's Bridge.....			120 30	Over “ “

DETERMINATION OF ALTITUDES,

And Notes on the Barometrical Observations taken on the Old Carson and Johnson Immigrant Roads over the Sierra Nevada, 1855.

The altitudes given in the following tables have been calculated from a series of observations made with the aneroid barometer during the journey. These observations are given at full.

The aneroid barometer used was No. 264, J. W. Queen, Chestnut Street, Philadelphia. It will be seen by a comparison with the register of Dr. Logan, of Sacramento which follows, that the aneroid was two-tenths of an inch lower than the Doctor's barometer on the first of August. There is reason to believe that the latter even was too low, but in the absence of a standard barometer, it is impossible to tell what the true height of the mercury should be in this country at the sea level. Certain it is, that the barometers in general use here, mostly of English construction (ship barometers), stand *very low*; while those which have been prepared with care and set up in San Francisco, on the contrary, appear to stand *too high*. It is possible that the quicksilver may be impure in the latter, and its specific gravity in consequence, too little. We await with impatience the arrival of a standard barometer, which is now on its way to this country, sent by the Smithsonian Institute to the San Francisco Academy of Natural Sciences.

In reducing the observations into altitude, I have considered it more advisable to depend rather upon the results obtained by successive differences, from station to station, taken with a few hours of each other under nearly similar atmospheric circumstances, than upon those obtained by any other mode. Thus, instead of taking the mean of all the observations at any camp as the reading at the upper station, and the present uncertain base of our sea level as the lower reading, I have, in all cases, preferred taking the difference between the last observation on leaving camp and the first observation made on the road, and so on, the difference between each observation and its last preceding one, until our arrival at the evening camp where the first observation made is the one used. The successive differences thus obtained, being put together, give the heights furnished in the table. Although this method carries an error once committed throughout the entire series, still I conceive it gives a nearer approximation to truth than a mean derived from the few observations made at any camp and compared with what I may consider as an altogether imaginary base could possibly give.

In addition to the aneroid barometer, I was furnished with one of Green's iron cistern mountain barometers, but from the difficulties attendant upon setting up this instrument, it could only be used at the principal camps by way of a test on the aneroid. Unfortunately, I did not receive it in time to set it up in Sacramento so as to compare it with the aneroid before leaving on our journey. This comparison was, however, made at Placerville and at the astronomical station in Clear Lake Valley, the highest permanent camp on the journey, and in both cases the two instruments coincided, as will be seen by the Register. At this camp the mountain barometer was unfortunately broken, and so no further comparisons could be instituted. The fluctuations of the aneroid are more considerable than those of the mercurial barometer, particularly those caused by the non-periodic variation of atmospheric pressure.

The corrections for horary variations and extreme air temperatures, given in the very valuable Barometrical Reports of L. Blodget, Esq., of the Smithsonian Institute, and Dr. George Engelmann, of St. Louis, and used in the reduction of the observations made on the explorations of the Lieutenants Whipple and Beckwith, and which appear to be required for the California climate, however applicable they may be to the mercurial barometer, do not appear to answer for the aneroid.

There is, indeed, an uncertainty as to the amount of correction the aneroid required for differences of temperature, and indeed as to what formula is most applicable to the reduction of observations made with this instrument. After trying several, I found the well-known formula of Bailey, Formula 38, Astronomical Tables, to give the best results, and have therefore used it in all cases.

There is another source of uncertainty with the aneroid; it appears highly sensitive to wind, and the amount of correction required can only be considered as approximately known. Hourly observations should be taken with the instrument at the principal points of a survey to get data for future use; my time, however, was too much occupied with the other duties of the survey to allow me to give that attention I would have wished to this subject. Yet, notwithstanding all these uncertainties and sources of error, I have had several most surprising instances of the correct working of the aneroid used. It is with considerable satisfaction and pleasure that I give the following comparisons, with actual measurements since made by the Hon. Sherman Day over the same ground in the survey of the Immigrant Wagon Road.

In my preliminary report, dated October 5th, and published on the following day, I gave the approximate heights of Cary's Mill in Carson Valley, and the head of Carson Cañon in Hope Valley. The difference of elevation between these two points was 1,456.2 feet. Mr. Day, on his return in the last week in December, gave me his instruments with theodolite and chain, up Carson Cañon between the same points, which amounts to 1,455.4 feet, thus proving the wonderful and absolute accuracy of the instrument in this observation.

In the height of Luther's Pass, above the same point in Hope Valley, the difference will be seen to be 695.5 feet by my observations; Mr. Day's measurement makes it 715.6 feet. There is an apparent error here of twenty feet, but the height given by me was at the lowest point of the divide, while the road crosses a small ridge slightly elevated above the former, which makes the observations almost, if not quite, identical. In the height of the Slippery Ford Hill we correspond again exactly. In some points, however, there are discrepancies. Mr. Day makes the descent from Marlette's Flat to Bigler Lake Valley forty feet greater than I do. In the height also of the Johnson Pass, Mr. Day's height will, I expect, exceed mine by about 100 feet; there is, however, a little uncertainty as our points of observation were not the same. I took the lowest point of the road on the summit of the divide, as the top of the pass, while the old road winds along on the divide for a quarter of a mile at an increased elevation.

I may also mention that, in the same preliminary report the difference between the elevation of the Mormon Station and of Cary's Mill, is within five feet of that made by reckoning it from the successive differences along the road.

So many instances of accuracy, absolute and approximate, gives me great reliance in the aneroid barometer, when used with care; but at the same time it is an instrument so liable to change its zero, from a jar or blow, that it ought to be carried in a

basket by hand, by person on foot, and not strapped across the shoulder or carried by a horseman. There being no means of detecting the amount of error caused by a change of zero, it is impossible to be too careful in its use. It is an instrument so adapted to an exploration of this nature, from the ease and rapidity with which the observations can be made, that it is certainly deserving of that care and attention that shall insure accuracy in its results.

A means of testing it at all the principal camps should likewise be provided, so as to obtain data for its temperature and horary correctness, as well as to be able to reset it, should its zero have been altered. The mercurial barometer should be used for this purpose, as the errors to which the measurement of hights by the boiling point is subject, are so very serious, that little dependence can be placed on results so obtained.

On my return to Placerville I handed over this aneroid to Mr. Day, who has had it with him ever since, testing it on several occasions. It has, however, had its zero altered by rough usage, several times; still, Mr. Day states, that the difference between certain points on the road were very similar to those previously given by me.

For more readily forming a conception of the relative level of the country, I have arranged a table of the altitudes of all the principal points on the old Carson and the Johnson Roads, in order of their elevations.

I have also inserted among these tables one, of the hights along the Sonora and Walker's River Immigrant Road, made from a series of observations, taken with an aneroid barometer, by me, when acting as Civil Engineer to the Railroad Expedition under Lieut. Moore, U. S. A., in 1853. The observations given were tested by the boiling point, at all the camps, which invariably gave a yet greater elevation. I am under the impression, however, that the hights given in the table are too great, for at all the points on the eastern slope of the mountains, high winds have lowered the instrument on several occasions. The mode of reduction I have employed was that of the *means* of the observations, against the monthly mean of Dr. Gibbon's barometer at San Francisco, as a base. As previously stated, this method of reduction I have since abandoned for that of successive differences, which, if applied to hights on the road in question, would lower them from 100 up, perhaps, to 400 or 500 feet, in the more eastern portions of the journey.

GEORGE H. GODDARD

TABLE OF APPROXIMATE DISTANCES AND ALTITUDES

On the Carson and Johnson Roads, as deduced from Observations with the Aneroid Barometer, taken by G. H. Goddard in connection with the Wagon Road Survey over the Sierra Nevada, August and September 1855.

SACRAMENTO TO JUNCTION OF CARSON AND JOHNSON ROADS.

PLACES.	Approx. Distance.		Approx. Altitude.		REMARKS.
	Last Station.	Sacrame'o.	Last Station.	Sea Level.	
	miles.	miles.	feet.	feet.	
Sacramento.....				57.0	S. Gen.'s Office, 4 th St. 2 nd story.
"				39.0	Levee, according to Dr. Trask.
Wellington Hotel....	22.0	22.0	408.1	465.1	Oaks scattering.
Summit Hill.....	1.0	23.0	447.5	912.6	
Pines on Ridge.....	1.0	24.0	91.1	1,003.7	Pines first appear among the oaks.
Divide.....			81.2	1,084.9	At head of fork of Cosumnes.
El Dorado House...			248.4	1,333.3	Pitch pines.
Mud Springs.....		41.5	183.7	1,517.0	
Diamond Springs...	1.5	43.0	196.5	1,713.5	
Placerville.....	2.0	45.0	41.6	1,755.1	At Cary's Hotel, ground floor.
"				1,770.5	By mean of 57 Observations.
On Hill.....				1,855.5	At Astronomical Station.
Elk Horn House.....	8.0	53.0	919.4	2,674.5	Hawley's Trading Post, forest.
Sportsman's Hall...	3.5	56.5	571.9	3,246.4	Steam Saw Mill.
Mountain Cottage...	2.0	58.5	232.5	3,478.9	Sugar pines, cedars and firs.
Junction House.....	2.0	60.5	464.0	3,942.0	At f'ks of Car. And Johnson roads.

TABLE OF APPROXIMATE DISTANCES AND ALTITUDES – CONTINUED.

OLD CARSON ROAD.

PLACES.	Approx. Distance.		Approx. Altitude.		REMARKS.
	Last Station.	Sacrame'o	Last Station.	Sea Level.	
	miles.	miles.	feet.	feet.	
Junction House.....		60.5		3,942.9	At F'ks of Car. and Johnson roads.
Forks' Road.....	2.0	62.5	205.5	3,737.4	Road to Diamond Springs.
Cold Spring Ranch....	9.5	72.0	780.1	4,517.5	Taylor's, at foot of Iron Hill.
Camp Springs.....	4.5	76.5	980.4	5,497.9	At Camp No. 2, south side ridge.
Summit of Divide.....	1.0	77.5	351.3	5,849.2	Road reascends ridge.
Head of Camp Creek.	5.0	82.5	946.6	6,795.8	Good road along divide.
Summit, Alder Hill.....	1.0	83.5	457.5	7,253.3	Rough Granite Hill.
Leak Springs.....	1.0	84.5	224.9	7,028.4	Road descends to South.
Gulch to Am. River....	1.0	85.5	20.0	7,008.4	" passes over ridge to N. slope.
Summit of Ridge.....	1.0	86.5	119.7	7,128.1	" reascends ridge.
Burnt Store.....	1.0	87.5	205.0	6,923.1	On low divide.
Volcano Road.....	1.0	88.5	338.5	7,261.6	Forks of Road.
Granite Hill.....	1.0	89.5	126.8	7,288.4	On divide.
Tragedy Springs.....	2.5	92.0	124.3	7,512.7	At Camp No. 3.
Summit Hill.....	1.5	93.5	273.3	7,786.0	Granite Hill.
Valley.....	1.0	94.5	325.1	7,460.9	Tributary of Mokelumne.
Summit, Breccia Pass.....	1.5	96.0	329.7	7,790.6	Cross from granite, the Breccia R'ge, to tributary of Moklm'ne.
Green Flat.....	2.0	98.0	54.0	7,736.6	" " "
Summit Divide.....	1.5	99.5	461.4	8,198.0	Reascends ridge to Shanty.
High Point.....	4.0	103.5	461.7	8,659.7	Granite ridge.
Carson Spur Pass.....	1.5	105.0	376.4	9,036.1	West summit, (highest pn't road).
Camp No. 4.....	0.5	105.5	299.8	8,736.3	On North slope of mountain.
Clear Lake.....	4.5	110.0	1,560.4	7,175.9	Astronomical Station No. 2.
Carson Pass.....	3.0	113.0	797.0	7,972.9	True divide of Sierra.
Red Lake.....	1.0	114.0	725.0	7,247.9	Small lake at foot of Red Mountain.
Hope Valley.....	3.5	117.5	712.4	6,535.5	At foot of spur in valley bottom.
Head Carson Cañon..	3.0	120.5	46.8	6,488.7	At Log Cabin.
Cary's Mill.....	5.5	126.0	1,456.2	5,032.5	Carson Valley.
Spur of Hill.....	2.0	128.0	447.2	5,479.7	" "
Thorington's	4.0	132.0	750.0	4,729.7	" "
Job's.....	6.0	138.0			" "
Mott's.....	8.0	140.0	284.0	4,445.7	" "
Daggett's.....	3.0	143.0	28.2	4,417.5	" "
Genoa.....	3.0	146.0	80.5	4,337.0	" "

TABLE OF APPROXIMATE DISTANCES AND ALTITUDES – CONTINUED

JOHNSON'S CUT-OFF ROAD.

PLACES.	Approx. Distance.		Approx. Altitude.		REMARKS.
	Last Station.	Sacrame'o	Last Station.	Sea Level.	
	miles.	miles.	feet.	feet.	
Sacramento.....				57.0	See last table.
Junction House.....	60.5	60.5		3,942.9	At forks of road.
South Fork Bridge.....	2.5	63.0	1,410.3	2,532.6	Rodger's, late Bartlett's
Summit, North Hill.....	3.0	66.0	1,510.6	4,043.2	Ridge Road.
Brockliss' Post.....	8.0	74.0	1,210.9	5,254.1	
Peavine Ranch.....	1.5	75.5	344.9	5,599.0	Foot of hill.
Peavine Hill.....	0.5	76.0	811.8	6,410.8	Very steep hill.
Burnt Store.....	4.0	80.0	138.5	6,549.3	
Silver Creek Ranch...	3.0	83.0	272.1	6,277.2	Road descends to river.
Valley of S. Fork.....	2.0	85.0	1,376.1	4,901.1	Point, wagon road turns up hill.
Camp on "	4.0	89.0	235.5	5,136.6	Above Strawberry Flat, ¼ miles.
Slippery Ford.....	1.0	90.0	222.1	5,358.7	At Log Cabin.
Boulder Hill.....	1.0	91.0	492.4	5,851.1	First hill beyond Slippery Ford.
Upper "			182.1	6,033.2	Hill beyond flat.
Camp on Flat.....	4.0	95.0	440.0	6,473.2	Upper flat.
Johnson's Pass.....	1.0	96.0	279.3	6,752.5	Summit of true divide.
Lake Valley.....	1.0	97.0	782.4	5,961.0	About fifty feet above river.
Marlette's Flat.....	2.0	99.0	1,186.0	7,147.0	Lower end flat.
Luther's Pass.....	2.0	101.0	38.0	7,185.0	Summit of divide.
Hope Valley.....	2.0	103.0	696.3	6,488.7	At Log Cabin.
Cary's Mill.....	5.5	108.5	1,456.2	5,032.5	Carson Valley.
Genoa.....	20.0	128.5	695.5	4,337.0	Late Mormon Station.

BY DAGGETT'S TRIAL.

Lake Valley.....		97.0		5,691.0	
Smith's Station.....	2.0	99.0	3.3	5,958.7	Bigler Lake Valley.
Junction Trail.....	9.0	108.0	65.9	5,882.8	" "
Daggett's Pass.....	2.5	110.5	941.8	6,824.6	Ascent to Pass.
" Ranch.....	3.5	114.0	2,407.1	4,417.5	Descent to Carson Valley.
Genoa.....	3.0	117.0	80.5	4,337.0	Mormon Station.

TABLE OF THE COMPARATIVE HIGHTS

Above the Level of the Sea, of the several Stations, Hills and Passes, on the Old Carson and Johnson Roads, arranged in the order of their Altitudes, as determined by the Aneroid Barometer, 1855.

	Hight
Sacramento, levee	39
Mud Springs, El Dorado County	1,517
Diamond Springs	1,713
Placerville	1,755
Bartlett's Bridge over the South Fork of the American River	2,532
Hawley's, seven miles from Placerville, on Ridge	2,674
Junction of Diamond Springs, (road), on Old Carson Pass	3,737
Junction of Old Carson and Johnson Roads	3,942
Johnson Road, at north side of river, after having ascended hill from Bridge, brink of hill	4,043
Genoa, Mormon Station, Carson Valley	4,339
Daggett's Ranch, Carson Valley	4,417
Mott's Ranch, Carson Valley	4,445
Taylor's Ranch, on Old Carson Road, Cold Spring	4,517
Thorington's Ranch, Carson Valley	4,729
Johnson Road, at point where it turns up hill, from river, five miles below Slippery Ford	4,901
Cary's Mill, Carson Valley	5,032
Brockliss' Trading Post, (ridge), Johnson Road	5,254
Slippery Ford, on South Fork, Johnson Road	5,358
Camp Springs, Old Carson Road	5,497
Peavine Ranch, foot of Peavine Hill, Johnson Road	5,599
Boulder Hill, above Slippery Ford, Johnson Road	5,851
Smith's Station, Bigler Lake Valley	5,958
Lake Valley, foot of Johnson Pass	5,961
Silver Creek Ranch, Johnson Road	6,277
Summit of Peavine Hill, Johnson Road	6,410
Head of Carson Cañon, Hope Valley, Carson Road	6,488
Hope Valley, upper end of flat	6,535
Johnson Road, highest part of Ridge Road, at deserted trading post	6,549
Johnson Pass, highest point on Johnson Road	6,752
Head of Camp Creek, Alder Springs, Old Carson Road	6,795
Daggett's Pass, on trail from lake to Carson Valley	6,824
Leak Springs, Old Carson Road	7,027
Marlette's Flat, New Road	7,147
Clear Lake, between the summits of Old Carson Road	7,176
Luther's Pass, highest point on New Road	7,185
Red Lake, upper end of Hope Valley	7,248
Alder Hill, (summit), Old Carson Road	7,253
Volcano Road, Old Carson Road	7,261
Tragedy Springs, Old Carson Road	7,512
Carson Pass, summit of true divide, Old Road	7,973
West Pass, highest Point on Old Carson Road	9,036

TABLE OF APPROXIMATE DISTANCES, TOGETHER WITH APPROXIMATE ALTITUDES,

On the Sonora and Walker's River Immigrant Road, as deduced from observations taken with the Aneroid Barometer, by G. H. Goddard, Civil Engineer, during the Pacific Railroad Exploration under Lieut. Moore, U. S. A., October, 1853.

SONORA AND WALKER'S RIVER ROAD.

PLACE.	Approx. Distances.		Approx. Altitude.		REMARKS.
	Last Station.	Sacrame'o	Last Station.	Sea Level.	
	miles.	miles.	feet.	feet.	
Stockton.....				26.5	Mean of 12 Observations.
Camp No. 2.....	18.0	18.0		158.6	" 5 "
Keeler's Ferry.....	20.0	38.0		292.5	" 4 "
Rock River House.....				534.0	Single "
Summit Hill.....				1,051.8	" "
Green Springs.....				1,200.0	" "
Shumacher's.....				1,522.0	
Wood's Creek.....				1,636.0	Above Jamestown, 1/2 mile.
Sonora.....	27.0	65.0		2,109.0	Mean of 6 Observations.
Bald Mountain Pass...				2,940.0	Single "
Sullivan's Cr., Camp 5	5.0	70.0		2,667.0	Mean of 5 "
Judge Hoxley's.....				2,871.0	Single "
Staple's Ranch.....				3,433.0	" "
Foot of Ridge.....				4,086.0	" "
Camp No. 6.....	18.0	88.0		5,127.0	N. f'k Tuolumne, mean of 5 Obs'vs.
Head Sugar Pine Cr...				5,702.0	Single Observation.
Summit Ridge.....				5,904.0	" "
On Divide.....				6,257.0	High point on divide.
Strawberry Flat.....	8.0	96.0		6,031.0	Mean of 5 Observations.
Green Mountain.....				8,445.0	Summit, (2 Observations.)
First Granite M'ting....				9,397.0	
Blue Lake.....	11.0	107.0		9,119.0	Camp No. 8.
Green Flat.....				9,292.0	At descent to Relief Valley.
Relief Valley.....		118.0		8,590.0	
Camp No. 9.....	4.0	122.0		8,970.0	On Middle Fork Stanislaus.
Breccia Pass.....	6.0	128.0		10,150.0	Head of Middle Fork.
Camp No. 10.....	5.0	133.0		9,840.0	On lake flat of Tuolumne.
Pass.....	5.0	138.0		10,133.0	Summit, central ridge Sierra.
Camp No. 11.....	1.0	139.0		10,027.0	In Green Basin of Summit.
Camp No. 12.....	15.0	154.0		8,016.0	On flat of Walker's River.
Breccia Hill.....				9,258.0	On West side of river.
Camp No. 13.....	14.0	168.0		8,251.0	On West Creek.
Camp No. 14.....	19.0	187.0		6,246.0	Round Flat, Walker's River.
Camp No. 15.....	18.0	205.0		5,936.0	Walker's R., last camp in plains.

METEOROLOGICAL OBSERVATIONS

Taken on the Survey of the Boundary Line between California and Carson Valley and during a Journey over the Old Carson and Johnson Roads, in connection with the Wagon Road Survey over the Sierra Nevada, by George H. Goddard, Civil Engineer.

PLACE.	Date.	Time.	Aneroid	Ther	Mt. Bar.	REMARKS.
		h. m.	inches.	deg.	inches.	
Sac., S. Gen's Office.	Aug. 1	8	29.57	72		At 57 feet above Sea.
" "	"	2	29.50	85.5		Weather cloudless.
" "	" 2	8	29.57	73.2		" "
" "	"	2	29.51	85.8		" "
" "	" 3	10 A. M.	29.58	77.5		" "
" "	" 4	9:30	29.63	76.4		" "
" "	" 5	10	29.65	82		" "
" "	" 6	6	29.52	78		Start by Stage to Placerville.
Wellington House.....	"	10:30	29.16	90		On road at foot of hills.
Summit of hill.....	"		28.75	89		
On ridge.....	"		28.65	90		Pines first appear.
Summit Divide.....	"	11:50	28.55	92		Between Cosumnes and American.
El Dorado House.....	"	12	28.30	94		
Mud Springs.....	"	1:30	28.12	95		
Diamond Springs.....	"	2	27.92	95		
Placerville.....	"	3	27.87	96		Ground floor, Cary's Hotel.
"	"	4:30	27.83	100	27.83	Mountain Barometer set at zero.
"	"	10:30	27.87	78	27.77	The Float sinks.
"	" 7	6	27.94	66.4	27.70	" "
"	"	12	27.94	90	27.70	Float of M'tain Barometer sinking.
"	"	10	27.85	78.7	27.65	" 1/8 inch too low.
"	" 8	7	27.92	69	27.64	" sinking.
"	"	12	27.87	94	27.66	" 1/3 inch too low.
"	"	6	27.73	104	27.71	" "
"	"	11	27.85	78	27.66	" "
"	" 9	9	27.88	80.7	28.02	Mountain Barometer reset at zero.
"	"	12	27.81	94.3	28.04	" "
"	"	2	27.76	101	28.02	" "
"	"	11	27.78	86.5	27.92	" "
"	" 10	7	27.81	67.7	27.90	Overcast East wind.
"	"	12	27.78	86.7	27.93	Cool day.
"	"	6:30	27.68	90	27.89	Much Overcast.
"	"	11	27.76	76	27.83	Bright night.
"	" 11	6	27.82	64.5	27.84	Clear weather.
"	"	10:30	27.83	75	27.94	" "
"	"	3	27.78	88.2	27.95	" "
"	"	11	27.86	70	27.95	Cold night.
"	" 12	7	27.96	64	27.97	Bright Morning.
"	"	11	28.01	69.5	28.08	Weather clear, with cold
"	" 13	7	28.97	64.2	28.10	nights, smoky horizon,
"	"	1	28.03	82.2	28.05	with breeze during day and calm
"	"	6:30	28.00	84	28.02	nights.
"	"	11	28.05	69.7	28.01	
"	" 14	7	28.06	64	27.83	-l- 12 for air bubbles.

METEOROLOGICAL OBSERVATIONS – CONTINUED.

PLACE.	Date.	Time.	Aneroid	Ther	Mt. Bar.	REMARKS.
Placerville.....	Aug. 14	h. m.	inches.	deg.	inches.	
"	"	3	27.93	96.1	27.90	-l- 12 = 28.02
"	"	11	28.00	76	27.89	-l- 12 = 28.01
"	" 15	6:30	28.05	67	27.78	-l- 12 = 27.90
"	"	12	28.00	88.3	27.80	-l- 12 = 27.92
"	"	12	28.02	72.1		Air bubbles ascend tube.
"	" 16	7	28.03	68		Weather continues calm
"	"	2:30	27.87	96		by night with West breeze
"	"	11	27.96	77.4		by day.
"	" 17	7	27.98	71		Cloudless, but smokey.
"	" 18	3:30	27.95	77		
"	"	7:30	27.98	77.5		
"	"	1	27.94	88.2		
"	"	10:30	27.91	83		
"	" 19	7	27.96	86.3		
"	"	1	27.86	96		
"	"	12:30	27.93	76		
"	" 20	6:30	27.97	72.5		
"	"	3	27.86	100		
"	"	6	27.85	97		
"	"	12	28.00	74		
"	" 21	6	28.03	72.1		
"	"	1	27.94	98	28.20	Reset Mounting Barometer to zero.
"	"	6	27.87	100	28.15	
"	" 22	11	28.02	92.3		
"	"	4	27.88	103	28.10	
"	" 23	1	28.02	74	28.05	
"	"	8	28.20	77.5	27.95	
"	"	2	27.87	102	27.95	
"	" 24	7	27.75	92		
"	"	7:05	27.66	80		At Astronomical Station.
"	" 25	7	27.73	70		Cary's Hotel.
"	"	3	27.70	92		
Hawley's Camp, No 1...	" 26	1:30	26.78	66		Fine clear night.
" "	"	7	26.81	84.3		Weather cloudless.
" "	"	2	26.75	89.5		
" "	"	9	26.86	68		
" "	" 27	5:30	26.89	65		
" "	"	7:20	26.87	80		
Sportsman's Hall.....	"	9:15	26.33	81.5		
Foot of hill.....	"	10:15	26.08	84		
Junction House.....	"	11	25.73	89		Forks Carson and Johnson Roads.
" Diamond Sp. R. ...	"	12	25.87	88		" " and Diamond Spr. R'ds.
Trading Post.....	"	1	25.31	88		
Cold Spring Ranch.....	"	4	25.10	82		Taylor's House.
Camp 2, Camp Spr'gs...	"	11	24.25	55		Camp No. 2.
" "	" 28	6	24.24	54		
" "	"	7:20	24.18	76		
Summit of ridge.....	"	8:15	23.92	74		Weather cloudless, but smokey.
On ridge.....	"	9:30	23.82	70		
"	"	10:30	23.50	74		
Head Camp Creek.....	"	11:40	23.14	76		
Summit Alder Hill.....	"	12:15	22.89	70		
2 ^{hd} summit.....	"	1	22.76	72		
Leak Springs.....	"	1:20	22.93	72.2		
Head of Gulch.....	"	1:30	22.95	74		

METEOROLOGICAL OBSERVATIONS – CONTINUED.

PLACE.	Date.	Time.	Aneroid	Ther	Mt. Bar.	REMARKS.
		h. m.	inches.	deg.	inches.	
Summit of Ridge.....	Aug. 28	1:45	22.87	76		
Burnt Store	"	2	23.03	74		
Junction of roads.....	"	2:45	22.76	73		Volcano Branch Road.
Granite Ridge.....	"	3:45	22.65	69.5		
Camp 3, Tr'gedy Spr's...	"	5:15	22.53	60		Camp No. 3.
" "	"	8	22.58	46		
" "	" 29	6	22.55	47		
" "	"	9:30	22.56	60		
Summit of hill.....	"	10	22.32	67		
Valley.....	"	10:25	22.58	68		Valley running to South.
Foot Breccia Pass.....	"	10:55	22.48	67.5		
Summit.....	"	11:15	22.32	69.3		
Green Flat.....	"	12:10	22.32	68		
Shanty on ridge.....	"	1	21.96	69		
Summit Ridge.....	"	2:20	21.62	59		Wind rising from West.
Flat on ridge.....	"	2:50	21.57	63		
Summit Ridge.....	"	3:30	21.35	62		Strong S. W. wind.
" Pass.....	"	4:10	21.06	60		" "
" from peak.....	"	4:45	20.85	56		Peak to right of road.
Camp No. 4.....	"	6	21.26	44.7		Under shelter of ridge.
" "	"	8	21.31	38		Clear night.
" "	" 30	6	21.28	41		
" "	"	7:40	21.23	61		Strong S. W. wind.
Camp 5, Clear Lake.....	"	2:15	22.57	60		Clear weather.
" "	"	9:30	22.62	48		Clouds rising in East.
" "	" 31	7:30	22.67	42.8		Thunder storm from West.
" "	"	11	22.63	58		Fine weather again.
" "	"	8:30	22.66	38		
" "	Sept. 1	6	22.68	28		
" "	"	6:30	22.67	54		
" "	"	8	22.64	71		
" "	"	10:15	22.63	73	22.75	Set Mountain Barometer at zero.
" "	"	12	22.62	68	22.74	
" "	"	1:30	22.61	70	22.73	
" "	"	6	22.64	52	22.71	
" "	"	9:30	22.71	35.5	22.71	
" "	" 2	6:40	22.72	72.7	Broke.	
" "	"	3:30	22.64	70		
" "	"	9	22.70	42.8		
" "	" 3	6:30	22.70	42		
" "	"	6	22.56	64.2		Strong West wind.
" "	"	12	22.55	50		Very high West wind.
" "	" 4	4	22.47	62		Wind falling.
" "	"	11	22.55	33		Calm.
" "	" 5	5:45	22.55	30		Clear weather.
" "	"	1:45	22.54	70		
Summit Carson Pass....	"	4	21.88	59		
Red Lake.....	"	4:30	22.47	57		
Hope Valley.....	"	5	22.63	56		First bench in Valley.
"	"	5:15	22.80	67		Second "
"	"	6:15	23.04	45		Flat at foot of Spur.
"	"	7	23.12	48		Head of Cañon.

METEOROLOGICAL OBSERVATIONS – CONTINUED.

PLACE.	Date.	Time.	Aneroid	Ther	Mt. Bar.	REMARKS.
		h. m.	inches.	deg.	inches.	
Carson Valley.....	Aug. 5	9:30	24.40	54		Cary's Mill, clear night.
"	" 6	8	24.41	51		" calm morning.
"	"	9:20	24.42	56		"
"	"	11:10	24.14	97		Spur of Mt., 2 mls. Fm Cary's R'nch.
"	"	12:15	24.74	88.3		
"	"	3	24.97	84.2		Mott's Ranch.
"	"	3:30	24.90	82		Dr. Daggett's.

METEOROLOGICAL OBSERVATIONS – CONTINUED.

PLACE.	Date.	Time.	Aneroid	Ther	REMARKS.
Carson Valley.....	Sept. 6	h. m.	inches.	deg.	
"	"	4:15	25.03	78.0	Dr. Daggett's.
"	"	7:20	25.08	70.2	Mormon Station.
"	"	9:15	25.14	67.8	"
"	7	8	25.28	54.0	"
"	"	4	25.04	78.8	"
"	"	11	24.92	64.0	Thorington's Ranch.
"	8	7	25.05	62.3	
"	"	9:15	24.98	68.0	
"	"	1	24.85	75.0	
"	"	4	24.18	83.0	Cary's Mill.
Hope Valley.....	"	6:30	23.12	62.0	Shanty at head of Cañon.
"	"	9	23.15	50.0	"
"	9	5:30	23.20	34.0	"
"	"	7:30	23.15	57.0	"
Luther's Pass.....	"	9:10	22.53	72.0	Summit of Pass.
Lake Valley.....	"	11	23.10	70.0	Spur, on leaving trail.
"	"	1:30	22.10	76.1	Top of Granite Ridge.
Head of Truckee.....	"	3	21.71	73.0	Summit of Divide.
Clear Lake.....	"	4:15	22.49	68.0	Return to Camp No. 5.
"	"	9:15	22.52	54.0	Clouds rising.
"	10	4:45	22.44	64.0	Strong West wind.
"	11	7	22.50	59.0	
"	"	5:15	22.47	62.0	Very windy.
"	12	6:30	22.58	38.0	Calm.
"	"	8:30	22.51	72.0	
"	"	3:40	22.48	68.0	Strong West wind.
"	"	10	22.49	40.0	Calm night.
"	13	7	22.48	54.0	
"	"	11:30	22.52	72.0	
Carson Pass.....	"	1:15	21.84	76.0	
Red Lake.....	"	2	22.40	73.0	
Hope Valley.....	"	2:45	22.71	73.0	First Bench on small Flat.
"	"	3:15	22.77	70.0	Second Bench on large Flat.
"	"	3:45	22.93	72.5	Foot of Spur, Hope Valley proper.
"	"	4:40	22.95	70.0	Camp No. 6, foot of Luther's Pass.
"	"	7:45	23.07	35.0	Calm bright night.
"	14	6:30	23.09	32.0	Fleesy clouds.
"	"	9:30	23.06	67.5	"
Luther's Pass.....	"	10	22.55	76.0	
Marlette's Flat.....	"	10:50	22.57	77.0	Lower end of Flat.
Lake Valley.....	"	12	23.48	77.0	Foot of ascent to Luther's Pass.
"	"	2	23.53	78.0	Smith's Post.
"	"	3	23.59	69.5	
Bigler Lake.....	"	6:30	23.62	58.0	Camp No. 7, at point of timber.
"	"	10	23.62	44.0	South end of Bigler Lake.
"	15	6	23.70	39.0	Calm morning.
"	"	11	23.60	65.0	
"	"	4	23.60	67.0	Wind rising.
"	"	6:30	23.59	54.0	Strong S. W. wind.
"	16	7	23.58	48.0	S. W. wind with clouds.
"	"	9:15	23.52	55.0	Camp NO. 8, Astronomical Station.
"	"	5:30	23.56	48.0	Cold bleak wind.
"	"	10	23.53	43.0	
"	"	6:45	23.59	36.0	Snow clouds on mountains.

METEOROLOGICAL OBSERVATIONS – CONTINUED.

PLACE.	Date.	Time.	Aneroid	Ther	REMARKS.
Bigler Lake.....	Sept. 16	h. m.	inches.	deg.	
"	"	9	23.53	63.0	Snow clouds on mountains.
"	"	4:20	23.58	42.5	Raining heavily, with wind.
"	18	12:30	23.64	60.0	Fine morning, calm.
"	"	6:15	23.63	52.0	Heavy thunder storm to West.
"	"	10:50	23.72	32.0	Fine night, a few clouds.
"	19	9	23.71	57.0	Fine and calm.
"	"	10:30	23.74	37.0	Clear night, calm.
"	20	6:30	23.78	35.0	Fine and calm.
"	"	10	23.72	44.5	Cloudy night.
"	21	6:45	23.73	41.0	Clear morning.
"	"	10			Cloudy night.
"	22	8:30	23.63	59.0	Cumuli rising,
"	"	10	23.64	60.0	
Lake Valley.....	"	12:15	23.57	65.0	At junction of wagon road trail.
Daggett's Pass.....	"	1:45	22.74	61.0	Heavy rain cloud on Job's Peak.
"	"	3:30	22.77	49.0	Raining heavily in Carson Valley.
Carson Valley.....	"	4	24.93	61.0	At Dr. Daggett's.
"	"	6:45	24.95	59.5	At Mormon Station.
"	23	7:15	25.06	45.0	" bright day.
"	"	7	24.95	62.0	" red clouds at sunset.
"	24	7	25.09	44.0	" fine morning.
"	"	9	25.11	63.0	" beautiful calm day.
"	"	12:30	24.96	83.0	At Mott's Ranch.
"	"	9:30	25.12	70.0	" bright night.
"	25	1:45	25.14	65.0	" at starting up Valley.
"	26				" on return.
"	27	1:30	24.86	74.8	" windy day S. W.
"	"	7:30	25.00	60.0	" calm night.
"	28	7:30	25.07	59.7	" calm, at leaving.
"	"	9	25.10	74.0	At Dr. Daggett's, calm.
Daggett's Pass.....	"	11:15	22.80	74.0	
"	"	11:20	22.83	61.0	
Lake Valley.....	"	12:30	23.57	87.0	Junction of road and trail.
"	"	3:50	23.52	88.0	At Smith's Post.
"	"	4:45	23.48	72.0	Foot of Johnson's Pass.
Johnson's Pass.....	"	5:15	22.84	66.0	
Camp. No. 9.....	"	5:45	22.95	63.0	On South Fork American River.
"	"	7:30	23.07	42.0	Fine clear night.
"	29	6	23.13	38.0	
"	"	10:45	23.11	65.0	
"	"	1:30	23.07	72.0	
"	"	3:15	23.04	71.0	S. W. wind rising.
Summit Hill.....	"	5	23.40	72.0	Above Slippery Ford.
" of granite hill...	"	5:10	23.55	72.0	
Slippery Ford.....	"	5:50	23.96	72.0	At Log Cabin.
Camp No. 10.....	"	6:15	24.12	60.0	One mile below Slippery Ford.
"	"	7:30	24.21	48.0	Fine night.
"	30	5:30	24.24	44.0	Fine clear morning.
"	"	6:30	24.26	44.5	At starting.
Foot of hill.....	"	7:30	24.50	56.0	
Silver Creek Ranch.....	"	9:15	23.38	76.0	Head Gulch, falling into South Fork.
Divide.....	"	9:35	23.27	75.0	Between South Fork and Silver Creek.
Burnt Store.....	"	10:15	23.18	84.0	Halt on ridge.
"	"	12	23.25	70.0	"

METEOROLOGICAL OBSERVATIONS – CONTINUED.

PLACE.	Date.	Time.	Aneroid	Ther	REMARKS.
		h. m.	inches.	deg.	
Summit, Peavine Hill.....	Sept. 30	1:45	23.39	82.0	
Foot of hill.....	"	2:30	24.06	87.0	At lower ridge.
Brockliss'.....	"	3:10	24.34	85.0	Trading Post.
Point of Ridge.....	"	6	25.35	74.0	Above the bridge.
Rodger's Bridge.....	"	6:45	26.72	72.0	Over South Fork American River.
"	"	9	26.77	64.0	Calm.
"	Oct. 1	6	26.79	57.0	Calm, but very smoky.
"	"	7:10	26.80	59.0	" "
Bench on hill.....	"	7:25	26.27	63.0	" "
Junction House.....	"	8:10	25.54	76.0	Forks of Carson and Johnson Roads.
Mountain Ranch.....	"	8:40	25.80	77.0	Summit Ridge.
Sportsman's Hall.....	"	9:20	25.98	84.0	"
Hawley's.....	"	10:40	26.44	95.0	Elk Horn House.
Placerville.....	"	1:25	27.45	96.0	Cary's Hotel, second story.
"	"	7:30	27.54	79.0	Calm day.
"	"	9:30	27.56	76.0	"
"	"	10:50	27.54	72.0	"
"	" 2	6	27.62	63.0	Cary's Hotel, second story.
"	"	7	27.65	63.4	" "
"	"	1:35	27.50	90.0	" "
"	"	8:30	27.52	78.0	" "

BAROMETRICAL REGISTER

Kept at Sacramento, by Dr. Logan, for the months of August and September, 1855.

1855.		Sunrise.		8 P. M.		10 P. M.		1855.		Sunrise.		8 P. M.		10 P. M.	
August.	Bar.	Ther.	Bar.	Ther.	Bar.	Ther.	Sept.	Bar.	Ther.	Bar.	Ther.	Bar.	Ther.	Bar.	Ther.
1	29.71	60	29.69	86	29.80	68	1	29.79	60	29.85	80	29.85			
2	29.72	63	29.72	77	29.73	67	2	29.85	60	29.85	78	29.85			
3	29.73	64	29.73	88	29.74	70	3	29.83	62	29.78	83	29.78			
4	29.77	64	29.79	90	29.78	73	4	29.78	61	29.72	80	29.72			
5	29.82	67	29.78	88	29.77	73	5	29.73	60	29.73	80	29.73			
6	29.77	66	29.75	90	29.72	72	6	29.79	60	29.78	86	29.78			
7	29.72	62	29.67	93	29.68	76	7	29.78	60	29.77	90	29.77			
8	29.69	68	29.68	98	29.62	76	8	29.77	62	29.69	91	29.69			
9	29.62	70	29.63	93	29.59	68	9	29.67	66	29.75	85	29.75			
10	29.61	66	29.56	81	29.54	66	10	29.67	62	29.68	79	29.68			
11	29.59	61	29.58	77	29.59	64	11	29.68	54	29.68	82	29.68			
12	29.73	60	29.73	78	29.74	66	12	29.74	58	29.70	80	29.70			
13	29.88	62	29.86	80	29.83	68	13	29.71	56	29.71	83	29.71			
14	29.81	65	29.82	85	29.78	69	14	29.73	58	29.74	79	29.74			
15	29.78	64	29.79	86	29.79	66	15	29.74	62	29.74	76	29.74			
16	29.79	62	29.77	89	29.80	70	16	29.74	58	29.74	71	29.74			
17	29.77	62	29.75	92	29.57	77	17	29.72	58	29.77	75	29.77			
18	29.75	69	29.75	88	29.73	76	18	29.79	54	29.77	76	29.77			
19	29.75	68	29.73	88	29.73	73	19	29.79	56	29.77	79	29.77			
20	29.77	66	29.75	90	29.76	71	20	29.79	57	29.74	77	29.74			
21	29.79	64	29.80	90	29.82	71	21	29.71	57	29.76	73	29.76			
22	29.82	65	29.82	93	29.82	74	22	29.75	56	29.76	73	29.76			
23	29.82	68	29.77	93	39.75	72	23	29.78	54	29.80	73	29.80			
24	29.71	66	29.66	87	29.64	68	24	29.82	58	29.83	80	29.83			
25	29.69	66	29.69	86	29.74	68	25	29.81	56	29.73	85	29.73			
26	29.82	64	29.81	81	29.82	68	26	29.71	61	29.65	90	29.65			
27	29.87	62	29.83	85	29.80	66	27	29.68	62	29.66	84	29.66			
28	29.82	62	29.77	83	29.70	63	28	29.70	56	29.72	89	29.72			
29	29.76	63	29.72	85	29.74	69	29	29.84	62	29.83	86	29.83			
30	29.77	64	29.77	83	29.77	66	30	29.82	60	29.77	88	29.77			
31	29.77	60	29.78	80	29.79	64									

BAROMETRICAL REGISTER

Kept at Coloma, El Dorado County, by W. Zelmer.

Approximate Latitude.

Longitude.

Altitude above Sea, 857 feet.

1855.	Thermometer.			Barometer.		Course of Wind.	REMARKS.
August.	8 A. M.	2 P. M.	8 P. M.	Morning.	Evening.		
1	72	93	81	290.6	29.10	N. N. W.	Pleasant.
2	81	92	81	29.09	29.10	N. N. E. N. W.	"
3	80	98	87	29	29	" "	"
4	83	95	81	29	29	N. E. E. N. E.	"
5	78	98	81	29.05	29	N. E. N. W.	"
6	80	98	84	29.15	29.15	N. W.	Warm.
7	82	100	82	29.10	29.10	"	"
8	82	102	82	26.10	29.15	N. E. N. W.	"
9	82	90	70	29.10	29.10	E. N. E.	Pleasant.
10	82	90	72	29.15	29.10	"	"
11	66	86	74	29.20	29.20	N. N. W.	"
12	66	84	70	29.20	29.20	"	Warm.
13	66	92	72	29.20	29.23	"	"
14	68	92	72	29.22	29.22	N. W.	"
15	70	90	82	29.22	29.24	"	"
16	70	98	82	29.22	29.20	"	Sultry and Shower.
17	72	98	88	29.21	29.25	"	Hot.
18	80	96	82	29.22	29.25	N. E.	"
19	80	97	94	29.22	29.22	E. N. E.	"
20	70	97	85	20.20	29.25	N. E.	"
21	80	98	82	29.02	29.23	E. N. E.	"
22	81	100	90	29	29.26	W. N. W.	"
23	82	96	86	29.25	29.25	N. W.	"
24	80	95	80	29.21	29.22	S. E.	"
25	80	92	76	29.22	29.22	N. W.	"
26	69	92	76	29.24	29.24	"	"
27	68	92	76	29.28	29.22	"	Pleasant.
28	60	88	70	29.22	29.24	"	"
29	65	86	72	29.22	29.22	"	"
30	68	86	72	29.22	29.22	N. N. E.	"
31	65	84	60	29.20	29.22	N. W.	Shower.

LIST

Of the several Stations of the Triangulation on the Eastern Boundary and Wagon Road Survey.

- A. Station at the south-east end base line, Bigler Lake triangulation.
- B. Station at west point of timber, Bigler Lake.
- C. Summit of Chrystal Peak.
- D. Station on Peak above Daggett's Pass.
- E. Station on Elephant Mountain, south of Old Carson Pass.
- F. Summit of highest peak of Job's Group of Mountains.
- G. Astronomical Station, Clear Lake Valley, north end base line.
- H. Station at east end of first and second base lines, Clear Lake.
- I. Station at east end of second base line, Clear Lake.
- J. Station on Job's East Peak, above Carson Valley.
- K. Station on North Granite Knob, Bigler Lake Valley.
- L. Summit of Little Thimbal, Rock, near Clear Lake.
- M. Station on Obelisk Hill.
- N. Station on Round Top Mountain.
- O. Summit of west peak of Job's Group of Mountains.
- P. Station on Pyramid Peak.
- Q. Station at south end of prolonged base, Carson Valley.
- R. Station on Red Mountain, north of Carson Pass.
- S. Station on Snow Peak, east of highest summit of Old Road.
- T. Astronomical Station, south end of Bigler Lake.
- U. Station north-west end of base line of Bigler Lake.
- V. Station north end base line of Carson Valley.
- W. Station south end measured base line of Carson Valley.
- X. Station to east of last Station, Carson Valley.
- Y. Summit of Cary's Peak, south of Carson Valley.

TRIANGULATION TABLE.

Triangles.	Angles.			Log Sines.	Sides.	Length in chain.		Logs of chain.	
	deg.	min.	sec.			chains.	links.		
Ast. Sta. 3, T (1)	T	66	10	50	9.916337	T A	78	08	1.895240
	A	95	39	40	9.997872	Base, A K	229	20	2.360218
	K	18	09	30	9.493660	T K	249	32	2.396752
(2)	T	62	22		9.947401	T K	249	32	
	K	17	35		9.480140	K B	224	32	2.350869
	B	100	03		9.993284	T B	76	49	1.883608
(3)	T	118	12		9.945125	T B	76	49	
	B	56	18		9.920099	T F	653	95	2.822134
	F	5	30		8.981573	F B	703	33	2.847160
(4)	B	75	50		9.986587	K B	224	32	
	K	71	30		9.976957	B C	394	12	2.595633
	C	32	40		9.732193	K C	402	96	2.605263
(5)	K	31	10		9.713935	K C	402	96	
	P	28	30		9.678663	K P	728	89	2.640535
	C	120	20		9.936062	P C	437	05	2.640535
(6)	A	67	55		9.966910	A K	229	20	
	K	87	40		9.999640	A O	554	02	2.748520
	O	24	25		9.616338	K O	513	80	2.710790
(7)	T	59	41	20	9.936161	T F	653	95	
	D	70	51	10	9.975284	T D	534	10	2.727626
	F	49	27	30	9.880776	D F	616	75	2.783011
(8)	D	9	00	00	9.194332	PC	437	05	
	P	20	58	41	9.553896	PD	1,396	00	3.144884
	C	150	01	19	9.698682	D C	1,000	02	3.000098
(9)	V	110	05		9.972755	Base, V W	160	00	2.204120
	W	48	35		9.875014	W D	413	07	2.616020
	D	21	20		9.560855	V D	329	82	2.518279
(10)	V	33	30		9.741889	Base, V W	160	00	
	W	136	30		9.837812	W J	508	55	2.706339
	J	10	00		9.239670	V J	634	25	2.802262
(11)	V	13	40		9.373414	V W	160	00	
	W	105	35		9.983735	W X	43	33	1.636771
	X	60	45		9.940763	V X	176	64	2.247092
(12)	V	49	12	33	9.879153	V X	176	64	
	X	116	47	27	9.951320	V J	634	25	
	J	14	00	00	9.383675	X J	537	15	2.730095
(13)	V	56	20		9.920268	V X	176	64	
	X	108	45		9.976318	V F	649	80	2.812778
	F	14	55		9.410622	X F	571	15	2.756728

TRIANGULATION TABLE – CONTINUED.

Triangles.	Angles.			Log Sines.	Sides.	Length in chain.		Logs of chain.	
	deg.	min.	sec.			chains.	links.		
(14)	V	33	30	9.741889	V J	634	25	2.950587 2.730350	
	Q	43	55	9.841116	V Q	892	40		
	J	102	35	9.989441	Q J	504	70		
(15)	Q	73	15 00	9.981171	Q J	504	70	2.824172 2.772208	
	J	61	58 47	9.945754	J Y	667	07		
	Y	44	46 13	9.847736	Y Q	591	85		
(16)	V	76	35 00	9.987892	V D	329	82	2.518279	
	J	29	54 32	9.697770	V J	634	25		
	D	73	30 28	9.981753	J D	643	28		
(17)	G	68	38	9.969075	Base, G H	34	96	1.5434009	
AB Base,	H	56	55	9.9231805		G I	35	99	1.5561659
	I	54	27	9.9104155		H I	40	00	1.6020600
(18)	G	127	07	9.90168	G I	35	99	2.14938 2.0658037	
	I	41	08	9.81810	M I	141	05		
	M	11	45	9.30886	G M	116	36		
(19)	I	139	50	9.80957	M I	141	05	2.55695 2.37216	
	M	25	33	9.634778	M S	360	48		
	S	14	37	9.40200	S I	235	59		
(20)	G	58	04	9.928763	G M	116	36	2.327706 2.25652	
	M	88	46	9.999899	G N	212	67		
	N	33	10	9.738048	N M	180	52		
(21)	M	119	22	9.94027	M I	141	65	2.40821 2.19135	
	I	31	56	9.72340	R I	254	97		
	R	28	42	9.68144	M R	155	26		
(22)	N	126	54	9.90292	N S	489	11	3.12805 2.99608	
	S	36	10	9.77095	S F	1,392	90		
	F	16	56	9.46428	N F	991	01		
(23)	N	63	33	9.77490	N M	180	52	2.68941 2.55690	
	M	126	06	9.90741	N S	489	11		
	S	17	21	9.47452	M S	360	48		
(24)	N	148	31	9.71788	N S	489	11	3.08095 2.88297	
	S	19	20	9.51991	S P	1,204	90		
	P	12	09	9.32319	P N	763	79		
(25)	P	55	49	9.9164272	N P	763	79	2.882974	
	F	39	36	9.8065575	N F	991	01	2.996080	
	N	84	35	9.9980563	P F	1,192	60	3.076502	
(26)	M	41	32	9.82155	M R	155	26	2.28072 2.44162	
	R	105	43	9.98345	R E	190	86		
	E	32	45	9.73318	M E	276	45		

TRIANGULATION TABLE – CONTINUED.

Triangles.		Angles.			Log Sines.	Sides.	Length in chain.		Logs of chain.
		deg.	min.	sec.			chains.	links.	
(27)	R	99	32		9.99396	R E	190	86	2.702758 2.754410
	E	61	07		9.94231	R Y	504	37	
	Y	19	21		9.52027	E Y	568	10	
(28)	G	67	50		9.966653	G M	116	36	2.461308
	M	87	46		9.999670	M E	276	45	
	E	25	24		9.632392	G E	289	26	
(29)	R	40	45		9.814753	R Y	504	37	2.824172 2.984090
	Y	109	45		9.973671	J Y	667	07	
	J	29	30		9.692339	R J	964	03	
(30)	N	51	12		9.891719	N R	763	79	2.953893
	K	54	45		9.912031	K p	728	89	
	P	74	03		9.982950	N k	899	28	
(31)	N	42	29		9.82954	N S	489	11	2.44917 2.54637
	L	103	31		9.98780	N L	281	04	
	S	34	00		9.74756	L S	351	81	
(32)	P	18	20		9.49768	N P	763	79	2.91719
	N	105	02		9.980519	N L	281	04	
	L	56	38		9.921774	P L	874	42	

LIST OF FLOWERS

Gathered on Survey of Carson Road, Sept., 1855, and named by Dr. Kellogg of San Francisco.

PLACERVILLE.

Photenia, specimen (29), growing in newly dug ground, on water ditch, on hill side.

Erigisimum (17), wall flower, yellow.

Solidag (30 and 37), yellow and deep blue.

Pulmonaria (35), yellow.

Eriogonum (34), purple and white.

Eucharidium (21), violet.

Astar (36), deep blue.

Peutsternum (19), blue and white.

HAWLEY'S.

Solidago (22), yellow.

Gnaphalium (32), white.

Eriogonum (31), yellow.

Astar (18), light blue.

Gilia (16), deep blue.

HEAD OF CAMP CREEK.

Mimulus (41), bright yellow.

Lupinus (23), blue.

Astar (38), blue; (27) white.

Gnaphalium (39), white.

Cautua (42), rose red.

Astar (26 and 44), varieties of blue.

TRAGEDY SPRINGS.

Chrysipsis (45), yellow.

Senecis (24), yellow and (46) purple.

WEST SUMMIT.

Sarradia (12), red.

Enia (9 and 47), several varieties of heath.

Gilia (15), white.
Epilobium (4), deep blue.

CLEAR LAKE VALLEY.

Mimulus (33), violet.
Cholropion, of Behur (13), purple.
Delpinum (40), blue.
Erilobium (1), blue.
Gnaphalium (13), white.
Sida (43), purple.

CARSON PASS.

Mimulus Splendors (14), deep red.

CARSON VALLEY.

Arclostaphylas, shrub
Juniperous, shrub.
Oenothera, white.
Happlopappus, artemesia yellow.

There are several more flowers and shrubs, of which I have not the names, and which required further examination.

NOTES ON THE ASTRONOMICAL OBSERVATIONS.

The chronometers were both rated to Greenwich mean time. The following are the rates furnished with the chronometers by Mr. Thomas Tennent of San Francisco:

DENTS, 1,946,

Is this day fast of Greenwich mean time.....	min. 2	sec. 10.6
Loses daily six-tenths of a second.....	0	0.6

July 12, 1855.

PARKINSON & FORDSHAM'S, 1,628,

Is this day slow of Greenwich mean time.....	min. 10	sec. 30.5
Gains daily three-tenths of a second.....	0	0.3

July 12, 1855.

The chronometers were brought from San Francisco by steamer in the most careful manner. The observations made for rating them here, made chronometer 1,946, which I shall call Chronometer Dent, to be gaining instead of losing, and 1,628 to be losing instead of gaining. The unsteadiness of the ground, however, made these observations rather uncertain.

On July 30th, the following comparisons were made by telegraph with Mr. Pace at San Francisco:

Greenwich Mean Time, transmitted by Mr. C. Pace, from San Francisco.			Time, by Dent, 1,946.		
hours.	min.	sec.	hours.	min.	sec.
12	47	00	12	49	20
12	49	00	12	51	20
12	55	00	12	57	20.5
1	09	00	1	11	20.5
1	15	00	1	17	21

I transmitted my time to him three times, and received answer that I was two minutes twenty seconds too fast. It appeared by this that Chronometer Dent was gaining two and a quarter tenths of a second per day, and that Chronometer 1,628 was

losing seven and a half tenths per day, being nearly the reverse of the rates given by Mr. Tennent. I therefore wrote to him, stating the circumstances, inquiring if an error had not been made in copying off the rates he sent me, to which he replied that the rates he had given were correct at that time.

The observations at Placerville showed that a material increase in their rates had taken place. On August 23rd a comparison by telegraph with Mr. Pace's true Greenwich time at San Francisco, gave the following result:

Greenwich Mean Time, transmitted by Mr. C. Pace, from San Francisco.			Time, by Dent, 1,946.		
hours.	min.	sec.	hours.	min.	sec.
8	00	00	8	04	07.5
8	05	00	8	09	13
8	19	58	8	24	12.5

The first and second observations were made without the telegraph lines of the two companies being connected, the last was made in connection, and appeared to be a very perfect observation. This result made Dent 1,946 to be 4' 14.5" too fast, having gained 114.5" in twenty-four days, or a gain of 4" and nearly eight-tenths per day. By the mean of the several observations, however, during our stay at Placerville, it appeared to be gaining 5.6" per day during the first part of our stay there, and nearly six seconds per day during the last week. It is probable that from leaving Sacramento the rate increased daily that shown at Sacramento to that of the last week in Placerville.

The rate during our stay at Clear Lake Valley was 6.1" per day.

On reaching Bigler Lake the rate decreased to about 4.9" daily. The badness of the weather there allowed me very few good observations. The chronometer was then carried over into Carson Valley, but only one set of observations were then taken, as stated in the journal, and on our return journey no observations were taken.

On returning the chronometers to Mr. Tennent on Nov. 14th, Chronometer Dent 1,946 was 10' 16.8" fast of Greenwich mean time.

The chronometer used in all the following observations was Dent 1,946, except when expressed to the contrary.

ASTRONOMICAL OBSERVATIONS.

PLACERVILLE, EL DORADO COUNTY. – ASTRONOMICAL STATION 1.

Determination of Time, August 9, 1855. – Afternoon Observation.

DOUBLE ALTITUDES OF THE SUN WITH SEXTANT.

Time by Chron.			Double Altitude.			Limb.	REMARKS.
hours	min.	sec.	deg.	Min.	sec.		
11	43	02	76	49	10	Upper.	Chronometer rated to Greenwich Mean Time. Barometer, 27.80. Thermometer, 100. Index error, Sextant, 12' 55".
11	45	42	76	49	10	Lower.	
11	47	50	74	58		Upper.	
11	50	29	74	58		Lower.	
11	52	29	73	10	10	Upper.	
11	55	10	73	10	10	Lower.	
11	51	30	71	14	20	Upper.	
12	00	12	71	14	20	Lower.	
12	01	45	69	34	20	Upper.	
12	04	27	69	34	20	Lower.	

Determination of Latitude.

DOUBLE ALTITUDES OF POLARIS.

17	24	33	77	24	00		Barometer, 27.78. Thermometer, 86.5.
17	44	51	77	33	40		
17	52	05	77	36	50		
17	55	59	77	38	30		
17	03	43	77	42	40		
17	06	50	77	47	20		

Determination of Latitude.

DOUBLE ALTITUDES OF ALTAIR AND JUPITER IN THE EAST.

Altair in the East.						Jupiter in the East.					
Time.			Double Altitudes.			Time.			Double Altitudes.		
hours	min.	sec.	deg.	min.	sec.	hours	min.	sec.	deg.	min.	sec.
18	16	22	119	04	30	18	37	05	57	15	10
18	20	46	119	23	50	18	42	41	58	41	20
18	24	58	119	32	30	18	47	45	59	57	50
18	27	17	119	43	00	18	50	39	60	35	10
18	30	42	119	46	20	18	56	87	61	44	10

Determination of Time – August 10, 1855.

EQUAL ALTITUDES OF THE SUN.

Time, A. M.			Double Altitudes			Time, P. M.			Limb.	REMARKS.	
hours	min.	sec.	deg.	min.	sec.	hours	min.	sec.		barometer.	thermometer.
4	19	46	70			12	02	25	Upper.		
4	22	24	70			11	59	44	Lower.	A. M., 27.78	86.7
4	24	56	72			11	57	18	Upper.	P. M., 27.68	90.
4	27	36	72			11	54	39	Lower.	Smoky atmosphere.	
4	30	03	74			Lost.			Upper.		
4	32	51	74			11	49	24	Lower.		

For Index Error Sextant – Sun's double diameter.

min.	sec.		min.	sec.
44	00		44	00
19	16		19	16
63	16	Double Diameter.	24	44
15	49	Semi “	12	22
		Index error.....		

Determination of Latitude, August 10, 1855.

DOUBLE ALTITUDES OF POLARIS AND A AQUILÆ ON THE MERIDIAN.

Polaris in the East.						A Aquilæ on the Meridian.					
Time.			Double Altitudes.			Time.			Double Altitudes.		
hours	min.	sec.	deg.	min.	sec.	hours	min.	sec.	deg.	min.	sec.
17	06	04	76	57	10	18	14	38	119	10	00
17	16	56	77	10	00	18	20	20	119	29	10
17	21	59	77	14	20	18	25	59	119	40	00
17	26	05	77	17	00	18	32	56	119	47	50
17	34	02	77	19	30	18	37	58	119	43	40
17	39	55	77	27	30	18	43	54	119	34	50
17	48	48	77	29	10	18	51	12	119	15	40
17	52	02	77	33	50	18	55	32	118	50	00
17	56	27	77	40	10						
18	00	30	77	42	20						

Barometer, 27.76

Thermometer, 76.

Determination of Time, August 11, 1855.

ALTITUDES TAKEN OF THE SUN IN THE WEST, TAKEN WITH THEODOLITE.

Time.			Altitudes.			Limb.	REMARKS.
hours	min.	sec.	deg.	min.	sec.		
13	45	15	14	14	30	Lower.	Barometer, 27.78
13	48	24	14	08	00	Upper.	Thermometer, 88.2
13	51	53	13	28	00	"	Index error - 1'.

ALTITUDES OF THE SUN, WITH ALTITUDE AND AZIMUTH INSTRUMENT.

Time.			Alt., Up. And Low. Limbs.			Time.			Alt., Up. And Low. Limbs.		
hours	min.	sec.	deg.	min.	sec.	hours	min.	sec.	deg.	min.	sec.
14	8	20				14	22	35.5			
14	10	50.5	9	48	25	14	25	06.5	6	59	00

*Determination of Latitude and Meridian, with Altitude and Azimuth Instrument,
August 11.*

POLARIS AT EASTERN ELONGATION.

Time.			Altitude of the Three Verniers.									Azimuth.			
hours	min.	sec.	deg.	min.	sec.	deg.	min.	sec.	deg.	min.	sec.	deg.	min.	sec.	
17	51	02	38	51	20	21	08	35	81	08	30	69	59	10	
				deg.	min.	sec.	deg.	min.	sec.	deg.	min.	sec.	deg.	min.	sec.
Index error, from Zero, on Altitude Circle.....													05	50	
Second Vernier reading.....			60	00	00	- 21	08	35	= 38	51	25				
Third " "			120	00	00	- 81	08	30	= 38	51	30				
Mean corrected reading of Three Verniers.....										38	46	20			
Approximate Meridian on Azimuth.....										68	06	35			

Meridian of Polaris, August 12, 1855.

Time, A. M.	First Vernier.			Second Vernier.			Third Vernier.			Azimuth.		
	deg.	min.	sec.	deg.	min.	sec.	deg.	min.	sec.	deg.	min.	sec.
	40	22	30	19	37	05	79	36	20	68	06	35

*Determination of true Meridian, by Transits of S. Ursæ Minoris and Cephei – 51 Hev.,
August 12.*

Time.			Wire.	Altitude.			OBJECT.
hours	min.	sec.		deg.	min.	sec.	
16	57	25	Second Wire.				S. Ursæ Minoris.
17	00	59	Center "				" "
17	15	59	Second "				Cephei – 51 Hev.
17	20	15	Center "	36	02	05	" "

Barometer, 28.01

Thermometer, 69.5

Determination of Time, with the Altitude and Azimuth Instrument, August 14, 1855.

ALTITUDES OF THE SUN IN THE WEST.

Time.			Wires.	Time.			REMARKS.
Lower Limb.				Upper Limb.			Altitude 21° 51' 05"
hours	min.	sec.		hours	min.	sec.	Striding Level - - 2'
13	01	48	First Wire.	13	04	25	Axis Level - - 7' 30"
13	01	57	Center "	13	04	40	Barometer, 27.93
13	02	13	Third "	13	04	56	Thermometer, 96.1

Determination of Latitude, August 15, 1855.

ALTITUDES OF POLARIS IN THE EAST.

Time.			Altitude.			Striding Level.		Circle Level.		REMARKS.
hours	min.	sec.	deg.	min.	sec.	E	W	N	S	
17	45	40	38	39	30	42	48	50		Face West.
17	56	06	38	43	15	43	47	50		Azimuth, 70° 05' 30".
18	06	41	39	07	10	46	45	50		First Wire, Face East.
18	14	04	39	07	10	46	45	50		Second Wire, "
18	22	09	39	07	10	46	45	50		Third " "
18	29	18	39	12	35			50		Azimuth, 69° 56' 10".
19	11	25	39	28	45	45.5	46.5	50		
19	22	50	39	14	05			50		Face West.

Value of one division on Circle Level..... 5".
 Equal to an error in adjustment of..... -|- 4'.

Barometer, 28.02.

Thermometer, 72.1.

Determination of Time, with the Altitude and Azimuth Instrument, August 16, 1855.

EQUAL ALTITUDES OF THE SUN.

Time, A. M.			Wire.	Time, P. M.			Limb.	REMARKS.
hours	min.	sec.		hours	min.	sec.		
4	10	12	First Wire.	12	11	04	Upper.	Altitude 31° 56' 15"
4	10	27	Second "	12	10	47	"	Striding Level.
4	10	43	Third "	12	10	34	"	33 N. 42 S.
4	12	50	First "	12	08	23	Lower.	Circle Level, 50 E.
4	13	11	Second "	12	08	07	"	
4	13	26	Third "	12	07	54	"	
4	32	23	First "	11	50	02	Upper.	Altitude 36° 12' 05"
4	32	40	Second "	11	49	47	"	Striding Level.
4	32	54	Third "	11	49	31	"	35 N. 33 S.
4	35	08	First "		lost.		Lower.	Circle Level, 50 E.
4	35	24	Second "		lost.		"	Barometer 27.87.
4	35	40	Third "		lost.		"	Thermometer 96.0.

Determination of Latitude with Theodolite.

POLARIS IN THE EAST.

Time.			Altitude.			Time.			Altitude.		
hours	min.	sec.	deg.	min.	sec.	hours	min.	sec.	deg.	min.	sec.
16	45	31	38	24	30	17	09	53	38	32	00
16	48	08	38	25	30	17	12	26	38	33	30
16	51	45	38	28	30	17	14	41	38	34	00
16	54	21	38	29	00	17	16	07	38	34	15
16	58	35	38	30	00	17	17	50	38	34	45
17	04	55	38	31	00	17	20	08	38	36	00
17	08	27	38	31	30	17	21	59	38	37	00

Determination of Latitude with Theodolite.

ALTITUDES OF POLARIS IN THE EAST.

Time.			Altitude.			REMARKS.
hours	min.	sec.	deg.	min.	sec.	
17	24	01	38	37	30	Index error, 1 minute.
17	25	06	38	39	00	
17	26	30	38	39	15	
17	21	31	38	39	30	Barometer, 27.96.
17	28	34	38	40	00	Thermometer, 77.4.
17	33	00	38	41	15	At Eastern Elongation, N. 15, 30 W.

Easterly Variation of Compass, 17° 23'.

Determination of Time, with the Altitude and Azimuth Instrument, August 17th, 1855.

ALTITUDES OF THE SUN.

Time, P. M.			Wire.	Limb.	REMARKS.	Time, P. M.			REMARKS.	
hours	min.	sec.				hours	min.	sec.		
12	54	12	First.	Lower.	Striding Level.	13	13	01	Striding Level.	
12	54	25		Second.	"	33.5 W. 31.5 E.	13	13	16	33.5 W. 31.5 E.
12	54	41		Third.	"	Circle Level.	13	13	31	Circle Level.
12	56	52	First.	Upper.	45 W	13	15	43	50 W.	
12	57	07		Second.	"	Altitude.	13	15	57	Altitude.
12	57	22		Third	"	22° 46' 20".	13	16	12	18° 43' 35".

Barometer, 27.98.

Thermometer, 71.0.

Determination of Latitude.

ALTITUDES OF POLARIS IN THE EAST.

Time.			Altitude.			REMARKS.
hours	min.	sec.	deg.	min.	sec.	
17	33	56	38	54	45	Circle level, 50 W.

Determination of Time, with Altitude and Azimuth Instrument, August 17, 1855.

ALTITUDES OF ARTURUS IN THE WEST AND SIRIUS IN THE EAST.

Time.			Altitude.			Striding Level.		Circle Level.		OBJECT.
hours	min.	sec.	deg.	min.	sec.	N	S	E	W	
18	30	30	12	27	50	42	45		50	Arturus.
18	34	13	11	41	20	42	45		50	"
18	39	09	10	51	25	42	45		50	"
19	57	00	18	34	35	42	46	50		Sirius.
20	02	31	18	53	25	42	46	50		"
20	09	34	19	29	55	42	46	50		"

Determination of Longitude.

ECLIPSE OF FIRST SATELLITE OF JUPITER – DISAPPEARANCE.

Time.			REMARKS.
hours	min.	sec.	
19	36	30	Becomes very faint.
19	37	15	Quite disappeared.

Determination of Time, August 19, 1855.

EQUAL ALTITUDES OF THE SUN, WITH SEXTANT.

Time, A. M.			Double Altitude.			Time, A. M.			Limb.
hours	min.	sec.	deg.	min.	sec.	hours	min.	sec.	
4	44	08	76	13	50	11	36	28	Upper.
4	46	54	76	13	50	11	33	41	Lower.

Thermometer, 96.0.

Barometer, 27.86.

Determination of Longitude, August 19, 1855.

REAPPEARANCE OF THE FIRST SATELLITE OF JUPITER – FROM OCCULTATION.

Time.			REMARKS.
hours	min.	sec.	
16	26	21	Satellite becomes distinctly visible.

Determination of Latitude, with Altitude and Azimuth Instrument.

ALTITUDES OF POLARIS IN THE EAST.

Time.			Wire.	Altitude.			Striding Level.		Circle Level.	
hours	min.	sec.		deg.	min.	sec.	E	W	N	S
17	10	50	First.	38	36	15	42	44	16.5	19.5
17	19	00	Second.	38	36	15	42	44	16.5	19.5
17	26	03	Third.	38	36	15	42	44	16.5	19.5

Azimuth of Polaris at Eastern Elongation, 64° 34' 10".

Determination of Latitude, with Altitude and Azimuth Instrument.

TRANSITS OVER THE MERIDIAN.

Time.			Altitude.			Object.	REMARKS.
hours	min.	sec.	deg.	min.	sec.		
18	25	43	38	25	00	A Capricornus.	Azimuth of Meridian, 62° 42' 35".
19	03	29	74	10	00	E Cepheus.	Error..... 1' 00".
19	39	21	45	09	55	B Aquarii.	
20	03	25	13	29	25	Y Gruis.	62° 41' 35"

Determination of Time, August 20, 1855.

EQUAL ALTITUDES OF THE SUN WITH SEXTANT.

Time, A. M.			Double Altitude.			Time, P. M.			Limb.	REMARKS.
hours	min.	sec.	deg.	min.	sec.	hours	min.	sec.		
4	03	26	60	19	40	12	14	11	Upper.	Barometer.
4	06	09.5	60	19	40	12	16	53.5	Lower.	Thermometer.

Index error of Sextant -----.

Transits over the Meridian, with the Altitude and Azimuth Instrument, August 20, 1855.

FACE EAST.

Time.			Wire.	Altitude.			Object.	REMARKS.
hours	min.	sec.		deg.	min.	sec.		
14	00	57	First.	28	32	35	Moon F L.	Circle Level, 41 N.
14	01	11	Second.	Upper Limb.			"	
14	01	25	Center.	"			"	
14	01	38	Fourth.	"			"	
14	01	05	Fifth.	"			"	
16	22	09	First.	42	03	25	S. Ursæ Min.	" 25 N.
16	25	58	Second.	42	03	25	"	
16	32	28	Fourth.	42	03	25	"	Star descending.
16	36	47	First.	35	54	50	Cephei (51 Hev.)	Circle Level, 25 N.
16	40	50	Second	35	54	50	"	
16	44	53	Third	35	54	50	"	Star rising.
16	52	28.5	Center	69	22	25	Star in Hercules.	Circle Level, 26 N.
17	55	26	"	59	51	20	Altair.	" 30 N.
18	14	56.5	"	39	48	20	λ Ursæ Min.	" 44 N.
18	20	13.5	"	38	36	25	B Capricorni.	" "
18	24	45	"	36	09	25	A Capricorni.	" "
19	26	07	"	66	37	55	A Cepheus.	" 24 N, 13 S.
20	12	41.5	"	37	55	05 U L	Jupiter F L.	" "
21	01	20	"	21	00	00	Fomalhaut.	" 26 N, 14 S.
21	05	48	"	11	14	50	A Ursæ Major.	" "

Striding Level, 48 E, 43 W.

Barometer, 28.

Thermometer, 74.

Determination of Time, August 21, 1855.

EQUAL ALTITUDES OF THE SUN WITH SEXTANT.

Time, A. M.			Double Altitude.			Time, P. M.			Limb.	REMARKS.
hours	min.	sec.	deg.	min.	sec.	hours	min.	sec.		
3	55	24	56	56	20	12	25	56	Upper.	Barometer, 27.94.
3	58	18.5	56	56	20	12	23	10.5	Lower.	Thermometer, 98.

Transits over the Meridian, August 21, 1855.

FACE WEST.

Time.			Wire.	Altitude.			Object.	C. Level.		REMARKS.
hours	min.	sec.		deg.	min.	sec.		N	S	
19	22	17	Center.	66	39	15	A Cepheus.	9	28	
19	31	26.5	"	45	11	20	B Aquarii.	28		
20	07	36	First.	37	54	10 U L	Jupiter F L.			
20	07	49	Second.	37	54	10				
20	08	01	Center.	37	54	10				
20	08	13	Fourth.	37	54	10				
20	08	35	Fifth.	37	54	10				
20	57	16	Center.	21	01	50	Fomalhaut.	40	13	
21	02	00	"	11	13	25	A Ursæ Majoris	25		
21	30	04	"	18	45	40	Giausar.	43		
22	47	13.5	First.	40	01	50	Polaris.	49		
22	55	39	Second.	40	03	25	"	50		
23	04	17.5	Center.	40	05	05	"	42		
23	11	50	Fourth.	40	05	05	"	41		True Meridian.
23	19	32.5	Fifth.	40	05	00	"	40		52° 43' 15"

Determination of Latitude.

Time.			Altitude.			Object.	Center Level.		REMARKS.
hours	min.	sec.	deg.	min.	sec.		N	S	
0	54	09	39	55	08	Polaris	50		Face East.
1	01	09.5	40	08	55	"		42	" West.

Determination of Latitude, with Altitude and Azimuth Instrument, August 22, 1855.

ALTITUDES OF POLARIS IN THE EAST.

Time.			Altitude.			Center Level.		REMARKS.
hours	min.	sec.	deg.	min.	sec.	N	S	
18	32	28	38	15	00	38		Face East.
18	40	16	39	11	55	18	19	" West.
18	49	04	39	22	10	36		" East.
18	54	41.5	39	18	10	17	20	" West.
19	35	58	39	31	15	17	20	" "
19	46	53	39	41	05	35		" East.

Barometer, 28.02.

Thermometer, 74.

Determination of Time, August 23, 1855.

DOUBLE ALTITUDES OF THE SUN WITH BORDER CIRCLE.

Time.			Double Altitude.			Limb.	REMARKS.
hours	min.	sec.	deg.	min.	sec.		
4	44	15				Upper.	Right and Left Observation.
4	46	05				Lower.	
4	52	00				Upper.	
4	54	49				Lower.	
5	02	04				Upper.	
5	04	57.5				Lower.	
5	08	44.5				Upper.	Barometer, 27.87. Thermometer, 102.
5	11	46	306	40	00	Lower.	

Determination of Time, August 24, 1855.

DOUBLE ALTITUDES OF THE SUN WITH SEXTANT.

Time.			Double Altitude.			Limb.	REMARKS.
hours	min.	sec.	deg.	min.	sec.		
4	51	10	76	57	10	Upper.	Barometer, 27.75. Thermometer, 92.
4	54	10	76	57	10	Lower.	
5	02	25	80			Lower.	
5	04	58	82			Upper.	
5	07	55	82			Lower.	

Determination of Time, August 24, 1855.

EQUAL ALTITUDES OF *a* AQUILÆ, WITH SEXTANT.

Time, E.			Double Altitudes.			Time, W.			REMARKS.
hours	min.	sec.	deg.	min.	sec.	hours	min.	sec.	
16	00	06	104	59	50	19	19	16	By Altitude and Azimuth Instrument. <i>a</i> Aquilæ was on the Meridian at h. m. s. 17 29 45.
16	05	09	106	19	50	19	14	19	
16	09	49	107	32	30	19	09	41	
16	14	58	108	47	00	19	04	23	
16	19	18	109	48	00	19	00	08	

Determination of Longitude.

TRANSIT OF THE MOON AND *A* AQUILÆ.

Time.			Wire.	Altitude.			Object.	REMARKS.
hours	min.	sec.		deg.	min.	sec.		
17	39	21	First.		Lost.		<i>A</i> Aquilæ.	Barometer, 27.66.
17	39	34	Second.		"		"	Thermometer, 80.
17	39	45	Center.		"		"	
17	39	56.5	Fourth.		"		"	
17	40	10	Fifth.		"		"	
18	01	29	First.	24	43	20	Moon F L.	Lower Limb.
18	01	43	Second.	24	43	20	"	Circle Level, 44 N.
18	01	56	Center.	24	43	20	"	Striding Level, 46 W.
18	02	10.5	Fourth.	24	43	20	"	" 43 E.
18	02	25.5	Fifth.	24	43	20	"	

Determination of Time, August 25, 1855.

DOUBLE ALTITUDES OF THE SUN WITH SEXTANT.

Time.			Double Altitude.			Limb.	REMARKS.
hours	min.	sec.	deg.	min.	sec.		
4	30	03	68	00	00	Upper.	Barometer, 27.72. Thermometer, 80. Index error – 11' 44".
4	32	56	68	00	00	Lower.	
4	34	09	70	12	00	Upper.	
4	37	00	70	12	00	Lower.	
4	40	11	72	28	40	Upper.	
4	42	07	72	28	40	Lower.	
4	45	33.5	74	27	40	Upper.	
4	48	30.5	74	27	40	Lower.	

HAWLEY'S ELKHORN HOUSE. – CAMP. NO. 1.

Determination of Latitude with Theodolite, August 25, 1855.

ALTITUDE OF POLARIS.

Time.			Altitude.			Azimuth.	REMARKS.
hours	min.	sec.	deg.	min.	sec.	deg.	
20	36	58	39	56	00	N 15 W.	Var. Compass, 16° 25' 52"

DOUBLE ALTITUDE OF POLARIS WITH SEXTANT.

Time.			Double Altitudes.			REMARKS.
hours	min.	sec.	deg.	min.	sec.	
20	50	10	80	13	50	Barometer, 26.78. Thermometer, 84.3. Index error, 14'.
20	56	23	80	14	10	
21	00	44.5	80	20	30	
21	05	39	80	20	45	
21	13	08	80	24	10	

Determination of Time, August 26, 1855.

DOUBLE ALTITUDES OF THE SUN WITH SEXTANT.

Time.			Double Altitude.			Limb.	REMARKS.
hours	min.	sec.	deg.	min.	sec.		
6	01	40	100	40	20	Upper.	First set morning.
6	05	01.5	100	40	20	Lower.	
6	10	57.5	103	31	05	Upper.	Second set afternoon.
6	14	27	103	31	05	Lower.	
10	46	39	89	32	50	"	
10	49	40.5	89	32	50	Upper.	
10	52	06.5	87	38	40	Lower.	
10	55	11.5	87	38	40	Upper.	
10	56	44	86	02	00	Lower.	Barometer, 26.75. Thermometer, 89.5.
10	59	45	86	02	00	Upper.	
11	00	50	84	34	20	Lower.	
11	03	49	84	34	20	Upper.	

Determination of Latitude.

DOUBLE ALTITUDES OF POLARIS WITH SEXTANT.

Time.			Double Altitudes.			REMARKS.
hours	min.	sec.	deg.	min.	sec.	
16	27	51	77	23	10	Index error, 14'. Barometer, 26.86. Thermometer, 68.
16	32	27.5	77	27	20	
16	39	06	77	32	45	
16	43	32.5	77	35	30	
16	46	51.5	77	37	30	
16	50	24.5	77	40	30	

CAMP SPRINGS. – CAMP. NO. 2.

Determination of Latitude, August 27, 1855.

DOUBLE ALTITUDES OF POLARIS IN THE EAST.

Time.			Double Altitudes.			REMARKS.
hours	min.	sec.	deg.	min.	sec.	
19	05	08.5	79	18	20	Index error – 14'. Barometer, 24.25. Thermometer, 55.
19	11	33	79	22	40	
19	16	52	79	24	50	

Determination of Time, August 28, 1855.

DOUBLE ALTITUDE OF THE SUN.

Time.			Double Altitudes.			Limb.	REMARKS.
hours	min.	sec.	deg.	min.	sec.		
3	11	08	37	50	20	Upper.	Barometer, 24.18. Thermometer, 76.
3	14	54	38	16	10	Lower.	
3	17	14	40	13	50	Upper.	
3	20	01	40	13	50	Lower.	

TRAGEDY SPRINGS. – CAMP NO. 3.

Determination of Latitude, August 28, 1855.

DOUBLE ALTITUDES OF POLARIS WITH SEXTANT.

Time.			Double Altitudes.			REMARKS.
hours	min.	sec.	deg.	min.	sec.	
15	43	36	76	46	50	Index error, 14'. Barometer, 22.58. Thermometer, 46.
15	47	00	76	48	40	
15	50	02.5	76	52	10	
15	53	12	76	53	50	
15	55	39	76	55	40	
15	58	29.5	76	57	40	
16	00	59.5	76	59	40	
16	03	28	77	02	00	
16	07	52	77	06	30	
16	10	55	77	08	05	

Determination of Time, August 29, 1855.

DOUBLE ALTITUDE OF THE SUN WITH SEXTANT.

Time.			Double Altitudes.			Limb.	REMARKS.
hours	min.	sec.	deg.	min.	sec.		
5	19	50.5	85	53	10	Upper.	Index error, 14'
5	22	12	85	53	10	Lower.	
5	23	59.5	87	34	30	Upper.	
5	27	08	87	34	30	Lower.	
5	29	10	89	21	40	Upper.	
5	32	22	89	21	40	Lower.	
5	34	37	91	15	30	Upper.	Barometer, 22.56. Thermometer, 60.
5	37	55.5	91	15	30	Lower.	

CARSON WEST PASS. – CAMP 4.

Determination of Latitude, August 29, 1855.

ALTITUDES OF POLARIS WITH SEXTANT.

Time.			Double Altitudes.			REMARKS.
hours	min.	sec.	deg.	min.	sec.	
16	29	34.5	77	30	10	Index error – 14'.
16	31	38	77	30	30	Barometer 21.31.
16	34	42	77	31	40	
16	36	49	77	32	10	Thermometer 38.

CLEAR LAKE. – CAMP NO. 5. – ASTRONOMICAL STATION NO. 2.

Determination of Latitude with Theodolite, August 30, 1855.

ALTITUDES OF POLARIS IN THE EAST.

Time.			Altitude.			REMARKS.
hours	min.	sec.	deg.	min.	sec.	
16	05	06.5	38	29	00	Index error – 1'. Barometer, 22.63. Thermometer, 45.
16	11	32	38	31	30	
16	14	16.5	38	33		
16	19	05	38	35		
16	22	27	38	37		
16	41	30.5	38	43		
						At Eastern Elongation.

Determination of Latitude.

DOUBLE ALTITUDE OF POLARIS IN THE EAST WITH SEXTANT.

Time.			Double Altitudes.			REMARKS.
hours	min.	sec.	deg.	min.	sec.	
17	39	57.5	78	29	40	Index error – 14'
17	46	36.5	78	34	10	
17	50	24	78	35	40	
17	52	51	78	39	10	
17	55	36.5	78	41	10	
17	58	15.5	78	42	50	
18	03	08.5	78	46	30	Barometer, 22.63. Thermometer, 45.
18	06	27.5	78	49	20	

Determination of Time, September 1, 1855.

EQUAL ALTITUDES OF THE SUN WITH SEXTANT.

Time, A. M.			Double Altitude.			Time, P. M.			Limb.	REMARKS.
hours	min.	sec.	deg.	min.	sec.	hours	min.	sec.		
4	26	19	65	36	00	11	44	32.5	Upper.	
4	29	12	65	36	00	11	41	40	Lower.	
4	32	45.5	68	00	10	11	38	11	Upper.	
4	35	36	68	00	10	11	35	14	Lower.	
4	37	27	69	45	20	11	33	22	Upper.	
4	40	20.5	69	45	20	11	30	22	Lower.	
4	44	55	72	30	00	11	25	53	Upper.	Barometer, 22.62.
4	47	52	72	30	00	11	22	53	Lower.	Thermometer, 68.

Determination of Latitude, with Altitude and Azimuth Instrument, September 1, 1855.

ALTITUDES OF POLARIS AT EASTERN ELONGATION – FACE WEST.

Time.			Altitude.			Circle Level.		Striding Level.		Azimuth.		
hours	min.	sec.	deg.	min.	sec.	N	S	E	W	deg.	min.	sec.
16	27	35.5	38	26	30	15	31	48	57			
16	34	37	38	29	40	15	31	48	57	16	27	30
17	07	50.5	38	57	10	23	24	True.	True.	16	27	40
18	03	16	39	16	45	24	25	"	"			
18	13	42	39	22	20	25	24	"	"			Face East.

Thermometer, 35.5.

Barometer, 22.71.

*Determination of Latitude and Meridian, with Altitude and Azimuth Instrument,
September 2, 1855.*

ALTITUDES OF POLARIS IN THE EAST.

Time.			Altitude.			Circle Level.		Azimuth			REMARKS.
hours	min.	sec.	deg.	min.	sec.	N	S				
15	52	43	38	29	10	20	25				Face East.
16	00	36	38	32	15	21	25				
16	05	14	38	34	00	20	26				
16	08	31.5	38	35	05	20	26	16	27	50	
16	17	17	38	38	40	20	25	16	27	10	At Eastern Elongation. Face West.
16	23	44	38	41	05	20	25	16	27	00	
16	40	38	38	47	50	23	24	16	27	45	
16	46	20.5	38	50	05	24	23				
16	49	21	38	51	10	24	23				
16	53	16	38	52	45	24	23				
16	56	29	38	54	10	23	24				Barometer, 23.70. Thermometer, 43.
16	59	34	38	55	15	23	24	16	29	10	

Determination of Time, September 3, 1855.

EQUAL ALTITUDES OF THE SUN WITH SEXTANT.

Time, A. M.			Double Altitude.			Time, P. M.			Limb.	REMARKS.
hours	min.	sec.	deg.	min.	sec.	hours	min.	sec.		
3	37	35	46	20	00	12	32	12	Upper.	Index error.
3	40	18.5	46	20	00	12	29	28.5	Lower.	
3	45	08	49	15	00	12	24	37.5	Upper.	
3	47	56	49	15	00	12	21	46.5	Lower.	
3	52	19	52	00	00	12	17	22	Upper.	Barometer, 22.56. Thermometer, 64.2.
3	55	05	52	00	00	12	14	34	Lower.	
4	00	10	55	00	00	12	09	37.5	Upper.	
4	02	56.5	55	00	00	12	06	46	Lower.	

Transits to Determine True Meridian, September 3, 1855

Time.			Wire.	Altitude.			C. Level.		Object.	REMARKS.
hours	min.	sec.		deg.	min.	sec.	N	S		
15	26	58	Fourth.	42	07	30	17	27	s Ursæ Min.	Approx. Meridian. 18° 19' 27".
15	30	11	Fifth.	42	07	30	17	27	"	
15	51	54	First.	35	58	38	18	26	Cephei, 51 Hev.	Face West.
15	56	03	Second.	35	58	38	18	26	"	
17	22	40	Center.	39	52	15	9.5	35	h Ursæ Min.	
18	04	08	"	16	55	10	25	19	i Ursæ Maj.	
18	29	52	"	66	45	15	30	14	a Cepheus.	
19	00	20	"	13	20	40	23	21	y Grus.	
19	09	07	"	37	12	55	24	21	Jupiter.	F L and U L.
20	04	21	"	20	55	10	20	25	Fomalbaut.	Barometer, 22.55.
20	08	51.5	"	11	15	50	31	14	a Ursæ Maj.	Thermometer, 33.

Determination of Time, September 4, 1855.

DOUBLE ALTITUDES OF THE SUN WITH SEXTANT.

Time.			Double Altitudes.			Limb.	REMARKS.	
hours	min.	sec.	deg.	min.	sec.			
5	19	49.5	83	09	55	Upper.	Index error - - 4' 48".	
5	24	23.5	83	40	10	Lower.		
5	29	30	86	25	30	Upper.		
5	32	49.5	86	25	30	Lower.		
5	34	25	86	58	25	Upper.		
5	38	28	89	21	00	Lower.		
5	41	48	89	21	00	Upper.		
5	44	24	91	13	45	Lower.		
5	47	47.5	91	13	45	Upper.		
5	49	36	91	47	55	Lower.		
5	52	01	93	38	50	Upper.		
5	55	34	93	38	50	Lower.		
5	58	08	95	31	40	Upper.		Barometer, 22.47.
6	03	29.5	96	30	00	Lower.		Thermometer, 62.

Transits over the Meridian, September 5, 1855.

Time.			Altitude.			Circle Level.		Object.	REMARKS.
hours	min.	sec.	deg.	min.	sec.	N	S		
15	32	07	42	08	10	16	31	s Ursæ Min.	Instrument readjusted. Meridian 18° 32' 50". Barometer, 22.55. Thermometer, 36.
17	22	26	39	52	30	13	24	h Ursæ Min.	
18	26	06						a Cepheus.	
18	35	02						B Aquarii.	
19	04	46	37	09	20	12.5	38	Jupiter.	

CARY'S MILL, CARSON VALLEY.

Determination of Latitude, September 5, 1855.

DOUBLE ALTITUDES OF POLARIS IN THE EAST.

Time.			Double Altitudes.			REMARKS.
hours	min.	sec.	deg.	min.	sec.	
18	07	59	79	04	10	Chronometer use, Parkinson & Fordsham's No. 1,628; rated to Greenwich Time – slow of Dent's, 14' 45.5"
18	14	57	79	06	30	
18	19	06	79	08	40	Index error -I- 3' 40". Barometer, 24.40. Thermometer, 51.
18	22	27	79	12	20	
18	27	12.5	79	15	40	
18	31	57	79	19	00	
18	35	31.5	79	19	50	
18	39	00	79	22	40	
18	42	38	79	25	40	
18	46	37.5	79	28	10	

Determination of Time, September 6, 1855.

DOUBLE ALTITUDES OF THE SUN WITH SEXTANT.

Time.			Double Altitudes.			Limb.	REMARKS.	
hours	min.	sec.	deg.	min.	sec.			
4	04	55.5	61	07	05	Upper.	Chronometer used, Parkinson and Fordsham's, No. 1,628	
4	07	47.5	61	07	05	Lower.		
4	09	08	62	39	10	Upper.		
4	12	00	62	39	10	Lower.		
4	14	39	64	41	00	Upper.		
4	17	31	64	41	00	Lower.		
4	18	54.5	66	14	20	Upper.		
4	21	47.5	66	14	20	Lower.		
4	25	42	68	41	30	Upper.		Barometer, 24.42 Thermometer, 56.
4	28	34.5	68	41	30	Lower.		

MORMON STATION, CARSON VALLEY.

Determination of Latitude, September 6, 1855.

POLARIS IN THE EAST.

Time.			Double Altitudes.			REMARKS.
hours	min.	sec.	deg.	min.	sec.	
15	54	02.5	77	56	10	Azimuth of Polaris at Eastern Elongation N, 14 W. Time, 16 hrs. 36 min. Chronometer used, Parkinson & Forsham's Barometer, 25.14. Thermometer, 67.8.
16	00	16	77	58	10	
16	04	00	78	05	00	
16	06	27	78	05	30	
16	09	42	78	18	00	
16	12	35.5	78	11	20	
16	16	00	78	12	50	
16	19	02	78	14	40	
16	22	28	78	19	10	
16	25	47	78	22	40	

Determination of Time, September 7, 1855.

EQUAL ALTITUDES OF THE SUN WITH SEXTANT.

Time, A. M.			Double Altitudes.			Time, P. M.			Limb.	REMARKS.
hours	min.	sec.	deg.	min.	sec.	hours	min.	sec.		
4	06	07	60	56	40	11	30	26.5	Upper.	Index error. Chronometer used, Parkinson & Fordsham's Barometer, 25.04. Thermometer, 78.8.
4	08	58	60	56	40	11	27	35	Lower.	
4	12	19.5	63	12	40	11	24	17.5	Upper.	
4	15	09	63	12	40	11	21	34	Lower.	
4	18	35	65	30	50	11	17	59	Upper.	
4	21	30.5	65	30	50	11	15	05.4	Lower.	
4	25	26.4	67	59	50	11	11	08	Upper.	
4	28	24	67	59	50	11	08	15	Lower.	
4	33	46	71	00	00		Lost.		Upper.	
4	36	51	71	00	00		"		Lower.	
4	42	27	74	01	10	10	54	10.5	Upper.	
4	45	31	74	01	10	10	51	09	Lower.	

THORINGTON'S RANCH, CARSON VALLEY.

Determination of Time, Sept. 8, 1855.

DOUBLE ALTITUDES OF THE SUN WITH SEXTANT.

Time.			Double Altitudes.			Limb.	REMARKS.
hours	min.	sec.	deg.	min.	sec.		
4	25	38	67	49	50	Upper.	Index error. Chronometer, Parkinson & Fordsham's Barometer, 24.98. Thermometer, 68.
4	30	49	69	40	20	Lower.	
4	34	18	69	52	10	Upper.	
4	36	53.5	70	46	50	Lower.	
4	39	30.4	71	41	30	Upper.	
4	42	17	72	40	00	Lower.	
4	45	05	74	40	40	Upper.	
4	48	08	74	40	40	Lower.	
4	51	24	76	53	40	Upper.	
4	54	26	76	53	40	Lower.	

CLEAR LAKE. – CAMP NO 5. – ASTRONOMICAL STATION NO. 2.

Transits over the Meridian, September 9, 1855.

Time.			Wire.	Altitude.			Circle Level.		Striding Level.		Object.
hours	min.	sec.		deg.	min.	sec.	N	S	E	W	
16	25	19	Center.	35	58	50	17	27	48 46	52 54 re'd	Cephei (51 Hev.)
16	35	24	First.	59	46	10	16	29	47	54	Altair.
			Second.	59	46	10			48	53 re'd	"
16	35	48	Center.	59	46	10					"
16	36	00	Fourth.	59	46	10					"
16	36	12	Fifth.	59	46	10					"
17	01	40	First.	38	17	20	12	33	50	51	a Capricorni.
17	02	05	Center.	38	17	20			48	53 re'd	
17	02	29	Fifth.	38	17	20					
18	06	02.5	First.	66	46	20	7	37	46	54	a Cepheus.
18	06	55	Center.						48	52 re'd	
18	07	43	Fifth.								
18	23	30	First.	33	52	50	11.5	32	48	52	Y Capricornus.
18	23	56	Center.						49	51 re'd	
18	24	25	Fifth.								
18	30	54	Center.	34	29	55	12	32	48	50.5	s Capricornus.
18	31	19	Fifth.						47.5	51.5	
18	42	46	First.	36	57	25	12	32	47	52	Jupiter
18	43	11	Center.						48	51 re'd	(preceding limb.)
18	43	35.5	Fifth.								(upper limb.)
19	41	49	Center.				11	34	50.5 47	51.5 55 re'd	Formalhaut.

Azimuth of Meridian, 18° 32' 50"
Barometer, 22.52.

Instrument set with face West.
Thermometer, 54.

Determination of Time, Sept. 10, 1855.

DOUBLE ALTITUDES OF THE SUN WITH SEXTANT.

Time.			Double Altitudes.			Limb.	REMARKS.
hours	min.	sec.	deg.	min.	sec.		
5	26	55	82	40	20	Upper.	Index error.
5	34	27.5	86	05	10	"	
5	37	49.5	85	05	10	Lower.	"
5	40	29.5	85	54	20	"	
5	53	31	90	57	10	Upper.	Barometer, 22.44.
5	57	52	91	07	30	Lower.	
6	04	29.5	94	07	40	Upper.	Thermometer, 64.
6	08	20	94	07	40	Lower.	

Determination of Time, September 11, 1855.

EQUAL ALTITUDES OF THE SUN WITH SEXTANT.

Time, A. M.			Double Altitudes.			Time, P. M.			REMARKS.
hours	min.	sec.	deg.	min.	sec.	hours	min.	sec.	
5	09	49	76	28	00		Lost.		Index error.
5	12	56	76	28	00		"		
5	22	48	80	48	10	10	43	14	Barometer, 22.47.
5	26	00.5	80	48	10	10	40	01.5	
5	29	34.5	83	00	00	10	36	28	Thermometer, 62.
5	32	55	83	00	00	10	33	07.5	
5	39	00	86	00	00		Lost.		
5	42	27	86	00	00		Clouds.		

Transits over the Meridian, August 11, 1855.

Time.			Wire.	Altitude.			Circle Level.		Striding Level.		Object.
hours	min.	sec.		deg.	min.	sec.	N	S	E	W	
15	02	19	Center.	42	08	10	15	31	49.5	53	s Ursæ Minoris
				42	08	10			52.5	50 re'd	
15	09	45.5	First.	35	57	45	21	25	54.5	49.5	Cephei (51 Hev.)
15	17	55	Center.	35	57	45			46.5	57.5 re'd	
15	26	33	Fifth.	35	57	45					
15	45	28	First.	30	02	50	22	25	47.5	57	m Sagittarius.
15	45	54.5	Center.	30	02	50			55	49.5 re'd	
15	46	20	Fifth.	30	02	50					
16	02	35	First.	54	07	50	18	28	56	49	s Aquilæ
	Lost.		Center.	54	07	50			48.5	55.5 re'd	
16	03	10	Fifth.	54	07	50					
18	22	58	First.	34	30	35	22	27	46	63	s Capricornus.
18	23	22.5	Center.	34	30	35			56	53 re'd	
18	23	47	Fifth.	34	30	35					
18	34	27	First.	36	54	20	20.5	28.5	57	52	Jupiter.
18	34	52	Center.	36	54	20			48.5	60.5 re'd	(second limb.)
18	35	16.5	Fifth.	36	54	20					(upper limb.)
18	42	08	First.	50	16	30	19.5	29.5	49	59.5	a Aquarius.
18	42	33	Center.	50	16	30			56.5	52 re'd	
18	42	56	Fifth.	50	16	30					

Azimuth of Meridian, 18° 32' 50".
Barometer, 22.49.

Instrument set with face East.
Thermometer, 40.

Determination of Latitude, Sept. 11, 1855.

REAPPEARANCE OF THE FIRST SATELLITE OF JUPITER.

Time.			REMARKS.
hours	min.	sec.	
16	39	52	Satellite first visible.
16	39	52	" becomes quite distinct.

Determination of Time, September 12, 1855.

DOUBLE ALTITUDES OF THE SUN WITH SEXTANT.

FIRST SET – MORNING.

Time.			Altitude.			Limb.	REMARKS.
hours	min.	sec.	deg.	min.	sec.		
4	11	11	55	06	30	Upper.	
4	14	00	55	06	30	Lower.	
4	16	37.5	57	09	30	Upper.	Equal Altitude, 11° 48' 46".
4	20	37	57	32	30	Lower.	
4	23	40.4	58	40	10	"	
4	26	01	59	31	50	"	Equal Altitude, 11°42' 17".
4	28	22	61	24	50	Upper.	
4	31	16.5	61	24	50	Lower.	
4	33	17.5	63	12	00	Upper.	Barometer, 22.51.
4	36	13.5	63	12	00	Lower.	Thermometer, 72.

SECOND SET – AFTERNOON.

10	53	46	76	37	30	Upper.	
10	58	03.5	74	08	10	Lower.	Windy day – clouds.
11	01	05.5	74	08	10	Upper.	
11	03	21.5	72	19	10	Lower.	
11	42	17	59	31	50	Upper.	Barometer, 22.48.
11	48	46	57	09	30	Lower.	Thermometer, 68.

Determination of Longitude, September 12, 1855.

REAPPEARANCE OF THE SECOND AND THIRD SATELLITES OF JUPITER.

Time.			REMARKS.
Hours	min.	sec.	
15	04	45	First light of second Satellite of Jupiter.
15	04	50	Satellite distinct.
17	20	00	First light of third Satellite of Jupiter.
17	20	45	Satellite plainly visible.
17	22	17	" bright.
17	22	45	Equally bright as the second.

SOUTH SHORE OF BIGLER LAKE. – CAMP 6.

Determination of Time, Sept. 15, 1855.

DOUBLE ALTITUDES OF THE SUN WITH SEXTANT.

Time.			Double Altitudes.			Limb.	REMARKS.
hours	min.	sec.	deg.	min.	sec.		
4	36	13	62	46	50	Upper.	Index error -1- 6' 15". Windy day.
4	39	16	62	46	50	Lower.	
4	42	31	65			Upper.	
4	45	33	65			Lower.	
4	51	05.5	68			Upper.	
4	54	09	68			Lower.	
4	59	51.5	71			Upper.	Barometer, 23.60 Thermometer, 60.
5	02	59	71			Lower.	

BIGLER LAKE. – CAMP NO. 7. – ASTRONOMICAL STATION NO. 3.

*Determination of Latitude and Meridian, with Altitude and Azimuth Instrument,
September 16, 1855.*

ALTITUDE AND AZIMUTH OF POLARIS AT EASTERN ELONGATION.

Time.			Altitude.			Azimuth			Circle Level.		REMARKS.
hours	min.	sec.	deg.	min.	sec.	deg.	min.	sec.	N	S	
15	31	42	39	02	48	32	18	00	22	24	Striding Level true at Eastern Elongation.
15	43	43	39	07	35	32	18	30	23	24	Striding Level, 50 W 55 E.

Approximate meridian, 30° 25' 18".

Thermometer, 43.

Barometer, 23.53.

Determination of Time, Sept. 17, 1855.

DOUBLE ALTITUDES OF THE SUN WITH SEXTANT.

Time.			Double Altitudes.			Limb.	REMARKS.
hours	min.	sec.	deg.	min.	sec.		
4	32	20.5	60	28	13	Upper.	Index error -I- 6' 15". Sun in cloud.
4	35	19	60	28	10	Lower.	
4	43	41	64	28	20	Upper.	Cloud.
4	46	45	64	28	20	Lower.	
4	48	58	66	18	00	Upper.	
4	52	03.5	66	18	00	Lower.	
4	53	50	67	56	50	Upper.	Wet afternoon.
4	56	57	67	56	50	Lower.	
4	59	50	69	59	30	Upper.	Barometer, 23.53. Thermometer, 63.
5	03	00	69	59	30	Lower.	

Transits over the Meridian, September 18, 1855.

Time.			Wire.	Altitude.			C. Level.		Striding Level.		Object.
hours	min.	sec.		deg.	min.	sec.	N	S	E	W	
17	31	38	First.	67	04	15	16	32	56	53	a Cepheus. Face East.
17	32	30	Center.	67	04	15			53.5	55 re'd	
17	38	19.5	Fifth.	67	04	15					
17	55	34	First.	34	11	35	16.5	32	54	56.5	s Capricorni.
17	55	59.5	Center.	34	11	35					
17	56	24	Fifth.	34	11	35					
18	04	19	First.	36	20	35	17	32.5	58	52	Jupiter. F L and U L Face West.
18	04	44	Center.	36	20	35					
18	05	08.5	Fifth.	36	20	35					
18	14	50	First.	49	56	20	16	32.5	53	57	a Aquarius.
18	15	14.5	Center.	49	56	20					
18	15	38	Fifth.	49	56	20					

Barometer, 23.72.

Thermometer, 32.

Determination of Longitude, September 18, 1855.

REAPPEARANCE OF FIRST SATELLITE OF JUPITER.

Time.			REMARKS.
hours	min.	sec.	
18	35	34.5	First light visible.
18	36	03	Fully out.
18	36	21	Bright as other Satellites.

Determination of Time, September 19, 1855.

DOUBLE ALTITUDES OF THE SUN WITH SEXTANT.

Time.			Double Altitudes.			Limb.	REMARKS.
hours	min.	sec.	deg.	min.	sec.		
4	20	08	55	18	10	Upper.	Cloudy, with wind.
4	23	10.5	55	18	10	Lower.	
4	27	43.5	58			Upper.	
4	30	44	58			Lower.	
4	36	17	61			Upper.	
4	39	17	61			Lower.	
4	44	53	64			Upper.	
4	47	56	64			Lower.	Clouds.
4	53	43	67			Upper.	Barometer, 23.71.
4	56	49	67			Lower.	Thermometer, 57.

Determination of Longitude, September 19, 1855.

REAPPEARANCE OF THIRD SATELLITE OF JUPITER.

Time.			REMARKS.
hours	min.	sec.	
17	40	25.5	First light appears.
17	40	52	Satellite plainly visible.
17	41	18.5	" as bright as the rest.

Determination of Time, September 20, 1855.

EQUAL ALTITUDES OF THE SUN WITH SEXTANT.

Time, A. M.			Double Altitudes.			Limb.	Time, P. M.		
hours	min.	sec.	deg.	min.	sec.		hours	min.	sec.
4	13	07	52	20		Upper.	11	47	43.5
4	16	03	52	20		Lower.	11	44	42.5
4	20	29	55			Upper.	11	40	16.5
4	23	28	55			Lower.	11	37	21
4	28	55.5	58			Upper.	11	31	57.6
4	31	59.5	58			Lower.	11	28	57.5
4	37	32	61			Upper.	11	23	20.5
4	40	36.5	61			Lower.	11	20	18

Index error -I- 6' 20".

Thermometer, 57.

Barometer, 23.70.

Determination of Longitude, September 20, 1855.

LUNAR TRANIST.

Time.			Wire.	Altitude.			Object.	REMARKS.
hours	min.	sec.		deg.	min.	sec.		
14	59	53	Center.				s Sagittarii.	Error in Meridian. Instrument thrown out of adjustment by a blow.
15	41	36.5	First.				Moon F L.	
15	42	04	Center				"	
15	42	33	Fifth.				"	
15	54	31	Center.				B Sagittarii.	Cloudy night.
16	16	41.5	First.	38	41	05	a Capricornus.	
16	17	06	Center.				"	
16	17	31.5	Fifth.				"	

Determination of Latitude, Sept. 21, 1855.

DOUBLE ALTITUDE OF POLARIS WITH SEXTANT.

Time.			Double Altitudes.			REMARKS.
hours	min.	sec.	deg.	min.	sec.	
16	12	23.5	78	32	30	Index error -I- 5' 47". Barometer. Thermometer.
	Clouds.					

Determination of Time, Sept. 22, 1855.

DOUBLE ALTITUDES OF THE SUN WITH SEXTANT.

Time.			Double Altitudes.			Limb.	REMARKS.
hours	min.	sec.	deg.	min.	sec.		
4	20	00.5	53	59	10	Upper.	Index error -I- 5' 47".
4	23	04	53	59	10	Lower.	
4	24	28.5	55	32	10	Upper.	
4	27	32.5	55	32	10	Lower.	
4	28	46.5	57	05	10	Upper.	
4	31	51.5	57	05	10	Lower.	
4	32	43	58	28	00	Upper.	Barometer, 26.63.
4	35	47.5	58	28	00	Lower.	Thermometer, 59.

For Index error, Sextant –

Reading off are.....	37' 45"
“ on are.....	26' 10"
	<hr/>
	11 35
Index error.....	-I- 5 47

MORMON STATION, CARSON VALLEY.

Determination of Latitude, September 22, 1855.

DOUBLE ALTITUDES OF POLARIS WITH SEXTANT.

Time.			Double Altitudes.			REMARKS.
hours	min.	sec.	deg.	min.	sec.	
15	54	21	78	35	30	Index error -I- 3'.
16	00	25	78	39	10	
16	06	37	78	42	50	
16	10	34.5	78	46	10	
16	14	17.5	78	47	20	
16	20	04	78	53	10	
16	26	59	78	58	30	Barometer, 24.99.
16	30	30.9	79	01	10	Thermometer, 45.

Determination of Longitude.

LUNAR OBSERVATION – MOON AND JUPITER.

Time.						OBJECTS..
hours	min.	sec.	deg.	min.	sec.	
16	37	41	05	30	00	Angular distance of Moon's Lower Limb.
16	41	30	59	11	20	Double Altitude " Upper "
16	45	30	68	41	50	" Jupiter.
16	47	59.7	05	26	10	Angular Distance.
16	51	39	69	24	50	Double Altitude of Jupiter.
16	56	07.5	60	42	10	" Moon's Lower Limb.
16	58	54.2	05	22	40	Angular Distance.

Barometer, 24.99

Thermometer, 45.

Determination of Time, Sept. 23, 1855.

DOUBLE ALTITUDES OF THE SUN WITH SEXTANT.

Time.			Double Altitudes.			Limb.	REMARKS.
hours	min.	sec.	deg.	min.	sec.		
6	43	59.5	95	09	20	Upper.	Index error -I- 3'.
6	50	01	95	09	20	Lower.	
6	55	36.8	97	07	50	Upper.	
7	02	34.5	97	07	50	Lower.	
7	06	45	98	46	10	Upper.	Barometer, 24.96.
7	15	19	98	46	10	Lower.	Thermometer, 72.5.

MOTT'S RANCH, CARSON VALLEY.

Determination of Latitude, September 27, 1855.

DOUBLE ALTITUDES OF POLARIS IN THE EAST WITH SEXTANT.

Time.			Double Altitudes.			REMARKS.
hours	min.	sec.	deg.	min.	sec.	
15	10	57	78	06	40	
15	15	53	78	10	50	Barometer, 25.
15	19	10.5	78	11	40	
15	22	30	78	12	50	Thermometer, 60.

5. REPORT ON THE CALAVERAS ROUTE.

A TRIP TO CARSON VALLEY.

MURPHY'S, November 25, 1855.

Hon. S. H. MARLETTE, Surveyor-General:

Sir:

As any information in relation to a road from Carson Valley to Calaveras County is of especial interest to your readers at this time, I send you herewith an account of the expedition sent out from this place in August last, taken from the notes of our party; which, as it contains some items not contained in the published report, may add somewhat to the knowledge of the route, and keep alive an interest in an enterprise of so much importance to this section of the country.

Our party, consisting of Dr. N. C. Congdon, A. H. Hall, J. Thornton, L. W. Noyes, J. S. Niswander and H. Capron, together with a Mexican named Lemon, for packing and taking care of the animals, left the pleasant town of Murphy's at one o'clock in the afternoon of the 8th of August, for a month's sojourn in the mountains. The first fifteen miles, to the world-renowned Big Tree, with its smooth and well beaten track, its excellent timber, and varied and beautiful scenery, are so well and widely known as to need no description in this place. We passed over it in good time, arriving at the Tree at night, where we remained till morning.

Two miles from the Big Tree, in a north-east direction, we crossed one end of a beautiful valley, on which Mr. Woodruff has an excellent and valuable farm, and in which one of the branches of the Calaveras takes its rise. Four miles further on, the Union Water Company have a steam saw mill, for the manufacture of lumber for fluming. At this place the company have taken the water of the main branch of the Stanislaus, in one continuous flume thirteen miles in length, to the branch from which their old ditch conveys it to Murphy's, Douglass' Flat, Vallecito, Angel's Camp, etc., filling the miners' hearts with joy, and their pocket's with gold. The mill is a fine one, capable of the production of one thousand feet of lumber per hour.

Continuing in the same direction four miles further we reached Black Springs; a beautiful cold spring, surrounded with aspens and a plenty of grass for animals, in the immediate vicinity. Here we found gooseberries and raspberries in great abundance. This place seemed to be the limit of oak timber, as we saw none after leaving it. From here our road lay on a divide six miles to Big Meadows, where Smith & Co. are cutting hay. To this place there is a Wagon Road already opened, over which they haul a tun of hay at a load without any difficulty. On the whole route there is plenty of excellent timber, plenty of good grass, and "any quantity" of raspberries, gooseberries, etc. Some of the gooseberries were as large as a pigeon's egg, and of a most excellent flavor, and so abundant that we could have gathered a bushel each in two hours.

Big Meadow is a valley some six or seven miles long, and from half a mile to a mile in width, well covered with various kinds of grasses and clover. It forms the divide between the Stanislaus and Mokelumne rivers, a branch of each rising in it. The meadow is taken up and claimed by Smith and four others, who are cutting grass and

hauling hay to the saw-mill and Big Tree, hunting, etc. They furnished us with some venison, grouse, etc.

Pursuing a course north-easterly up the meadow to its head, we crossed a low, thickly timbered spur of the divide between the Stanislaus and the Mokelumne, of easy ascent and descent, and entered a very large valley which, from the signs of bears which we discovered, we called Grizzly Bear Valley. Smith's party killed a couple of grizzlies here while we were gone over. Another branch of the Stanislaus heads in this valley, which, after meandering through the valley, makes it exit through a gorge of rock, or gate, not more than twenty feet in width and forty or fifty high, nearly perpendicular, by damming which, the valley could be converted into a lake. This valley is nearly round, and some four or five miles across, with grass in great abundance. Passing across about three miles, we ascended another small spur and entered a smaller valley, nearly level with the top of the spur, in the center of which is a small lake. This valley we called Silver Valley, on account of its proximity to the silver mine which had been visited by one of our party on a former occasion, but which proves to be nothing more valuable than plumbago.

From Silver Valley, for a distance of eight miles, it is one continuous meadow, dotted with occasional thickets of timber, mostly aspen, or with islands of rocks, and bountifully supplies with water and a luxuriant growth of grass. Here we found a slate ledge, about thirty feet wide, lying across our path, in the north-west and south-east direction, the only slate we saw on the whole route. In it are traces of copper, iron and silver ore. There is some quartz in this neighborhood. Numerous lakes, abounding with duck, sand-hill crane, etc., may also be found. There are also bears, deer, woodchucks, squirrels, grouse and quails, particularly grouse.

Leaving this meadow and passing through a small belt of woods, we came into the north end of the most beautiful valley we even beheld. It is about a mile in width and three miles long, lying north and south. The hill on the west side slopes gracefully down to the valley, and is thickly timbered down to the very foot, where it terminates as abruptly, and in as straight a line, as if the valley had been cleared by the hand of man. Nature seems to have taken particular pains to select none but the thriftiest, straightest and tallest of her pines, for the frame of this beautiful picture. The east side is irregular, being made up of capes, or promontories, of granite, interspersed with trees. The entire valley, and even the timbered hill-sides, are thickly covered with excellent grass. A branch of the Stanislaus rises in this valley, and as it is the highest branch we found, we called this Stanislaus Valley.

In and around this valley we found an abundance of whortleberries, serviceberries and gooseberries. Taken altogether, this is the pleasantest place in which to spend a few weeks in summer, with which we are acquainted, abounding, as it does, in scenery, seldom, if ever, equaled, in game of various kinds, and a multiplicity of wild fruit.

From Big Meadow to Stanislaus Valley, the road lies on the south side of the dividing ridge between the Stanislaus and the Mokelumne; sometimes at the very base of the mountain, and sometimes at a greater distance; and numerous spurs extend southward from the main ridge, usually terminating in a hill more elevated than the rest of the spur, which is frequently crowned with a conglomerate formation, bearing a striking resemblance to a fort, or embattled castle, or sometimes to an old church-tower.

From Stanislaus Valley we ascended the ridge spoken of above, which is heavily timbered, and on the top of which we found a small lake. Here we are north-east from Murphy's about forty miles; thirty-one of which is a good traveled wagon road, and the remainder will require but little to make it as good as any mountain road in the State.

Descending the divide by an easy grade, we came to the foot of the valley, lying between two precipitous rocky ridges of great irregularity. The valley is about half a mile wide and three or four miles in length, gradually rising from the foot to the head, to which we gave the name of Pacific Valley. Through it runs a branch of the Mokelumne. Here we first saw Indians, although we had seen their tracks for some days before, and had kept watch all night, fearing our animals might come up missing. Suspecting, from the freshness of their tracks, that we were watched by them, we kept a good look-out, till, finally, a dog, having more courage than his masters, ventured to bark; when, on looking up over our heads, we could see them peering over the rocks in all directions; but as we could not persuade them to come down, we were obliged to leave them.

Following the branch of the Mokelumne half a mile below Pacific Valley, we crossed the stream to the other side, and winding around the base of a mountain of rocks, on a bench nearly level for about a mile, we came to the foot of the Mokelumne Valley, which is about two miles long and half a mile wide, and, like Pacific Valley, is surrounded with huge masses of rocks, with the largest branch of the Mokelumne running through it. Plenty of grass. We staid here several days to explore.

Leaving Mokelumne Valley, we start down the branch in a north-west direction, and winding around and gradually ascending a hill, on a bench between the loose granite boulders at an easy grade, we reach the summit in about a mile. Going up a rock heavily timbered with hemlock and balsam, we pass several lakes with plenty of grass, and cross a small ridge into Indian Valley, four miles from Mokelumne Valley. Indian Valley is very large, being some ten miles long by three or four wide. On the east side of this valley commences a ridge, or wall, of conglomerate rock, and running north, forms the comb, or summit, of the Sierra Nevada, rising up perpendicular to the hight of several hundred feet, and assuming all sorts of grotesque and fantastic shapes, resembling pyramids, fortresses, statues, or anything else the fancy of the beholder chooses to imagine.

Here we found Indian tracks in abundance, and heaps of wild onions, which they had been gathering and piling up, but they had run and secreted themselves in the thickets of aspen as we came up. At length, seeing smoke issuing from behind some rocks, we put spurs to our horses, and before they were aware of our presence, we came upon ten or twelve squaws dressed in rabbit skins, roasting onions. Upon seeing us they started up and fled; but we headed them off, and upon giving them to understand that we intended them no harm, one of them went to a point of rock and called to an old Indian, who came up, and on seeing that we were about to cross a marsh, beckoned us to go around. Just as we had passed the marsh, and were approaching some rocks, he whooped twice, when almost instantly out came some fifteen or twenty Indians, armed with bows and arrows, apparently ready for battle. Expecting a combat, we prepared for it, by cocking our rifles and seeing our pistols clear; when, much to our surprise, one of them cried out, "How do you do?" We found them very friendly, many of them speaking tolerable English, or rather Pike County lingo. They were from Carson Valley; where, they said, there were a "heap" of

Americans, and “a right smart chance” for a road; from which we inferred that they had been on an emigrant road that led to Pike; if no where else. They said the valley was in sight, and upon ascending to the summit by a trail they had, leading into Little Valley, we found it to be even so, at which we were greatly surprised, as we had always understood that it was at least 140 miles from Murphy’s to Carson Valley.

The pass into Little Valley is many hundred feet lower than any other we could find; but it is impracticable for a wagon road, as the descent into Little Valley is so abrupt as to be difficult for a mule. These Indians were a portion of the Washaw tribe. Their captain, or chief, whom they call Pah-sook, was a dignified, intelligent looking old fellow, dressed in a blue flannel shirt, with a white fur hat, (on which was a black weed), on his head, which reminded us of some of the Broadway swells. He would have done very well, however, as would all of them, had they kept their exceedingly dirty hands out of our grub while we were cooking, a fault to which they were much addicted. They showed us how to make fire with two sticks, which is done by putting the end of a round stick, or reed, into a hollow, in another piece of soft wood, and twirling it between the hands until the friction creates fire. They also showed us a root, resembling a small artichoke, which they use for food, and it is very good, and would be considered a luxury anywhere. Among them we found one of our Cave City Indians, named Santiago, (having written certificates of good character from gentlemen in Cave City), who said he had been several days in the mountains with nothing to eat but berries and grasshoppers, and asked us to let him ride on one of our pack-mules, as he weighed very little, having gone without eating so long;” at the same time placing his hands on the gastronomic region to prove his assertion. As he seemed fatigued, we complied with his request. Santiago, Pah-sook, and his son, Joe, remained with us several days, and until we entered Carson Valley, when we indorsed Santiago’s certificate, and he left us.

From Indian Valley we went north, passing through a piece of thick timber, and between Twin Lakes, we entered a small valley, which we called Charity Valley; and passing out at the head, we reached what might be termed the pass, being the highest point on the whole route. This point is about four miles from Indian Valley, and the road rises gradually the whole distance. The timber is almost the only obstacle in the way of its being now a good wagon road. The descent eastward is nearly, or quite, as easy as the western slope, neither one forming any obstacles to the passage of loaded teams.

About a mile east of the pass, rising from the side of a smooth, round mountain, is a mass of conglomerate rock two hundred feet in high, having the appearance of a monument, which, in honor of our county, we called Calaveras Monument. It is an unmistakable landmark, standing entirely alone, with no other conglomerate rock within three miles.

After leaving the pass, which is about ten miles north from the divide between the Stanislaus and Mokelumne rivers, we came into Faith Valley. This is a most beautiful valley, about one miles wide and five in length, lying nearly east and west, the west end curving a little to the south; very level, and better stocked with grass and clover than any other place we saw. Through it runs a branch of Carson River, branches of which are found in Indian and Charity Valleys. Coming into the west end of this valley we followed it down about a mile, when we passed over a small ridge into Hope Valley, through which runs another branch of Carson River, emptying down the cañon. In the middle of

the south end of Hope Valley is a hill which can be passed, with a good road, on either side; and at the foot of the north end of this hill we struck the Old Carson and Hangtown Road, along which are scattered fragments of wagons, carcasses and skeletons of horses, mules, oxen, etc. Hope Valley is about ten miles long and three wide, and is plentifully supplied with grass and water. At the west end commences the cañon famed for its difficulties, disasters and break-downs, in years gone by. Down this cañon there is now a passable road; but a little money, judiciously expended, would make it much better. Passable as it is, however, there is not a foot of the route between it and Murphy's which is not susceptible of being made a better road than that can ever be, and at much less expense; although Mr. Cary, who has a saw-mill at the mouth of the cañon, said that if we could get a road half as good as that, we would have the best road across the mountains.

According to the estimated distances, as given above, the whole distance from Murphy's to Cary's saw mill, is about sixty-five miles, over forty of which, there is now a good traveled wagon road, and fifteen of the remaining twenty-five miles are through level meadows, where there need be nothing done, leaving only ten miles that will require any expenditure of money or labor.

As we had no barometer, we were unable to ascertain the height of the pass; but a couple of our party went out on the Hangtown Road to an elevation some hundreds of feet higher than the pass on this route, without attaining the summit. We feel confident, from the easy grade, the abundant supply of grass and water, the great quantity of game, fruit, etc., on this route, that it will prove to be the cheapest, best, pleasantest and most popular route that can be found entering the State from the east, and probably the best, if not the only route, over which a railroad can be built.

Very Respectfully,
Your obedient servant,

O. B. POWERS

6. REPORT ON THE HENNESS, OR DOWNIEVILLE, ROUTE.

MARYSVILLE, Nov. 10, 1855.

Hon. P. C. RUST:

Sir:

In compliance with your request for information, relative to the degree of practicability and merits of the route known as the Henness, or Downieville, Route, the survey of which I have just completed, I, at present, merely have time to give you a hasty description of the same, together with the results obtained by measurement and observations, in anticipation of a full report, with maps and illustrations, which will necessarily require some time to prepare.

The country examined, was from the Lower Crossing on the Truckee River, thirty-eight miles from the Sink of the Humboldt, to Camptonville, which place is forty miles in a north-easterly direction from Marysville, and connecting with the latter by a well graded road, over which two daily lines of stages pass.

Crossing to the north side of Truckee River, at the Lower Crossing, the route continues up the north side of that stream, in a generally direct and westerly course for the distance of forty-three miles, to what is known as the Upper Crossing. At this point the river makes a large bend to the south, and it becomes necessary to leave it.

Continuing my westerly course, striking off from the river and crossing a low intervening ridge, a distance of five miles further, brought me to Dog Valley, the waters of which find an outlet into the river. From this point to the Lower Crossing on the North Fork of the Truckee, a distance of eleven and three-quarter miles, the line of survey follows up and down a series of flat ravines, crosses intervening valleys and low divides, with uniform and light grades, rendering but little work necessary to make, over this portion, a road of superior quality, and with but little deflection from a direct line.

From the Lower Crossing of the North Fork of Truckee to the summit of the Sierra Nevada, the course is nearly west; the ascent, uniform and gradual, being along the valley of the creek, crossing and re-crossing to cut off bends and rising ground, that at points extend to the stream. Thus we arrive, in the distance of seventy-one miles from the Lower Crossing on Big Truckee, at the summit of the mountain, which is only 2,045 feet in altitude above the Upper Crossing of the same stream.

From the summit, the line of survey ascends the western slope of the Sierra Nevada, crossing a mountain *plateau* densely covered with timber, and at the distance of nine miles arrive at the Lower Crossing of the Middle Yuba River; which point is 1,200 feet below the summit, and traversed for the entire distance by descending grades.

From the Middle Yuba, the line again ascends on to the divide to Galloway's Ranch. Here the divide separates, and forms two distinct ridges; the principal ridge extending, by way of Camptonville, to the junction of the two branches of the river, the other extending and forming a divide between the Middle Yuba and Oregon Creek.

Oregon Creek, forming on the main divide, near Galloway's Ranch, runs in a south-westerly direction, and discharges into the Middle Yuba. The stage road from

Forest City and Downieville to Nevada, French Corall, and other points south of the Middle Yuba, traverses the latter divide.

From Galloway's, my line of survey continues descending, following the ravine, forming the head of Oregon Creek, to Forest City, which place is ninety-seven miles from the point of starting on the Truckee.

Continuing down the creek for about five miles below Forest City, the line then deflects to the north, along a number of small flat benches to the south of the main divide, and again arrives on the divide at Camptonville, one hundred and nine and three-quarter miles from the commencing point at the Lower Crossing on the Truckee, and nearly a due west course from the summit.

I have extended the levels along the entire line, from the Big Meadows on Truckee, twenty-eight miles above the Lower Crossing, to Camptonville, and find it unnecessary for any grades exceeding five degrees to overcome the heaviest ascents, or descents, to be encountered. I have not yet prepared an estimate of the cost for constructing a road, but I do not think it will exceed \$50,000; much less would suffice to improve the present road.

I have placed mile posts along the old road from the Desert to Forest City; but the distance will be reduced several miles after calculating angles and offsets noted.

By a more extended examination on the eastern side of the mountains, which the approaching winter season precluded examining, I have no doubt that twenty or thirty miles more can be saved, and the Desert partially, if not entirely, avoided by striking off from the route examined at Dog Valley, and running from there directly to Pyramid Lake, and thence to Humboldt.

Having given you a very brief and hasty description of the direction and locality of the route, you will see at a glance, by referring to the State Map, its importance, and the benefits to be derived by the counties adjoining Yuba and Sierra, by the constructing of a great road through them.

Grass and water are abundant along the entire route, excepting from the Middle Yuba to Galloway's; this portion is but sparsely supplied with grass, but good water will be found at several points intervening.

Hoping this hasty description will enable you to form an idea of the route,

I remain, Sir,

Your most obedient,

D. B. SCOTT.

7. REPORT ON THE DOWNIEVILLE AND BECKWITH ROUTE.

DOWNIEVILLE, Dec. 29, 1855.

Dear Sir:

Inclosed you will find a map of the upper part of the County of Sierra. That portion of the map west of Sierra Valley, is a copy of a map drawn by O. S. Dodson, (one of our Deputy County Surveyors,) from actual survey. I will say here, Mr. Dodson is making a complete map of this county, which he will show you in a few days. That portion of the inclosed map from the west side of Sierra Valley to the eastern limits, is drawn by myself on the same scale as the rest of the map (of one inch to the mile). The map commences on the South Fork of the Yuba, about twelve miles above Downieville, showing the line of the proposed road, on the north side of the river, following up the east branch to a pass marked by Dodson on the map, "Chapman's Pass," (which pass is believed to be from 500 to 800 feet lower than the highest point on the proposed ridge route, surveyed by Scott, and marked on this map, having also the advantage of not exceeding more than one and a half miles on the ridge, the rest of the road all lying in the valley.

Last winter I was with Mr. Dodson surveying for a turnpike from Downieville to Foster's Bar. His estimate for said road from here to Foster's bar, was \$47,000, which estimate was intended to be ample. Judging from his estimate and from my own knowledge of road-making, I would estimate as follows:

From Downieville first seven miles, \$3,500 per mile, or to one mile above Kanaka Flat.....	\$24,500
Next seven miles, \$1,000 per mile.....	7,000
Next three miles, \$2,000 per mile.....	6,000
Next eight miles, \$1,000 per mile.....	8,000
Next forty-five miles.....	3,000
For Turnpike Road from Downieville to Foster's Bar.....	47,000
	<hr/>
	\$95,500

Thus making from Foster's Bar to the Truckee Meadows, a good turnpike road, according to this estimate, of \$95,500, and but one hill between this place and the Truckee Meadows. You will see by the line of road traced on the map, that the road passes through Beckwith's Pass from Sierra Valley, which pass is on a level near Sierra Valley, and a better road now than is found in most of the foot hills near Sacramento Valley. There is seldom any snow in Sierra Valley to prevent traveling. Last winter stock was kept in the valley without feeding. In fact, you may pass by this line of road with not more than five miles of snow, when there are forty miles of snow on the ridge. It is believed by those that have traveled through this pass, to be the easiest one through the Sierra Nevada for a wagon road. I would therefore recommend this pass to your notice, before giving your opinion upon any route. It may cost more than some other route, but I believe it to be better for the State to build a good road at once than to

build one and abandon it in a few years, and build again; and believing this to be the best, I recommend this route to your notice.

Yours, with great respect,

A. P. CHAPMAN,
Downieville.

To the Hon. S. H. MARLETTE, Surveyor-General.

P. S. I should have written sooner, according to agreement, but have been waiting for Dodson to get his map far enough along for me to copy it. C.

APPENDIX B.

1. CIRCULAR TO COUNTY SURVEYORS.

Instructions for the Survey of Swamp and Overflowed Lands.

SURVEYOR-GENERAL'S OFFICE,
Sacramento, Aug. 25, 1855.

Sir:

My "Instructions" of the 13th of last June, which I had the honor to transmit to you, accompanied by "An Act to provide for the sale of the Swamp and Overflowed Lands belonging to this State," seem not to have been fully understood, and my request to acknowledge the receipt of the same having been complied with by but a few of the County Surveyors, I am therefore induced to transmit another copy of the same, with such explanations and additions as are deemed necessary.

SURVEYOR-GENERAL'S OFFICE,
Sacramento, June 13, 1855.

Sir:

I herewith transmit a copy of "An Act to provide for the sale of the Swamp and Overflowed Lands belonging to this State," approved April 28, 1855.

You will connect all surveys made under this Act with, and make them a continuation of, the United States' Surveys, until otherwise instructed.

[You are expected to survey the lands into half or quarter sections, except where smaller subdivisions are found necessary, the lines running true North, South, East and West.

The quarter sections are a half mile square, containing one hundred and sixty acres, and the half sections one mile in length by half a mile in breadth.]

If there are cases in your county in which, in your opinion, the value of these lands may be increased by a departure from this system, you will report the same, with the reasons on which your opinion is based, and suggest such modifications as you may consider the best interests of the State demand.

[You are expected to guard the interests of the Sate in this particular, the purchasers being considered abundantly able to guard theirs.]

I shall as soon as possible, forward to you copies of the United States township plats, on which will be delineated the Swamp and Overflowed Lands, according to the United States Survey.

[it is scarcely advisable to forward the plats unless there be a probability they will reach you. Of this I can be assured only by an acknowledgement of the receipt of circulars, etc., which many County Surveyors do not trouble themselves to transmit.]

It is believed that *hundreds of thousands*, perhaps *millions of acres* of the best lands in the State, which have been donated to her as swamp and overflowed lands, will

be disposed of by the General Government, *unless reliable evidence* shall be obtained, and presented by the State, to prevent the same.

I would respectfully request particular attention to the following remarks of the Commissioner of the General Land Office. He says that "all lands which from being swampy, or subject to overflow," are unfit for cultivation, and "all lands which though dry part of the year, are subject to inundation at the planting, growing, or harvesting season, so as to destroy the crop, and therefore are unfit for cultivation, taking the average season for a reasonable number of years as the rule of determination," are to be considered as granted to the State.

He also says the "United States Surveyor-General is authorized to receive such reliable evidence of the character of any of these lands as may be presented by the authorities of the State; and as many of the lands were surveyed in the dry seasons, and hence are not represented by the descriptive notes or plats as being of that character, I have supposed it a matter of sufficient importance to induce you to call upon the County Surveyors, or other respectable persons of your State, for statements under oath in relation to the swamp and overflowed lands in their respective counties."

He also says: "Such testimony will be considered as establishing the facts in the case," etc.

Section 3d of the Act of September 28th, 1850, required "That in making out lists or plats of the lands aforesaid, all the legal subdivisions, the greater part of which is wet and unfit for cultivation, shall be included in said lists and plats, but when the greater part of a subdivision is not of that character, the whole of it shall be excluded therefrom."

All the subdivisions upon the township plats are legal.

[The United States Surveyor-General said the "smallest legal subdivision" is "forty acres, or a smaller amount when so returned upon the plat."

I am of the opinion that testimony will be required as to the character of each and every quarter section or forty acre lot, and that any such lot is a legal subdivision," (except where a smaller quantity is returned on the U. S. Township plats,) to which the State is entitled when the greater part is wet and unfit for cultivation, or subject to inundation at the planting, growing, or harvesting season, etc., as described above.]

I am anxious to lay before the next Legislature such evidence of the amount and value of these lands which we are in danger of losing by neglect, as will insure the adoption of measures to secure the same to the State. Will you aid me in accomplishing this object? You can do so by sending me an estimate of the amount and value of these lands in your county, not designated as swamp or overflowed upon the township plates, and an estimate of the expense of surveying the true boundary of the same, and obtaining the statements under oath, of yourself and other respectable persons in your county, necessary to establish the facts in the case."

In this way you can do the State great service.

I would earnestly recommend *in all cases* in which you are called upon to survey, under this Act, lands which are *not* designated as swamp and overflowed on the township plats, that, if practicable, you transmit with your field notes and plats, the *statements under oath*, sufficient to establish the fact that the same *are* swamp and overflowed lands.

You will of course bear in mind the full import of the phrase “swamp and overflowed,” as explained by the Commissioner of the General Land Office, and by section 3d of the Act of September 28th, 1850, as quoted above.

[I would recommend the following form for your affidavits, where you know the lands to be swamp and overflowed, or subject to overflow:

I, -----, County Surveyor of the county of -----, being duly sworn, do depose and say that I am well acquainted with the method of surveying and marking the public lands, and that I have made in my proper person, examination of the lands in the following list, viz: (here give a list of the lands by legal subdivisions surveyed under the Act during the month by you, to the character of which you are willing to make affidavit,) and that from said examination I have discovered, and am well satisfied that every forty-acre lot, or its equivalent legal subdivision embraced in said list, is the greater part swamp or swampy, or subject to inundation at the planting, growing, or harvesting season, so as to endanger, injure or destroy the crops, taking the average season for a reasonable number of years as the rule of determination.

Witness my hand, this ----- day of -----, 1855.

Subscribed and sworn to before me, this ----- day of -----, 1855.

Justice of the Peace.

In case you cannot testify to the character of lands yourself, I would recommend the obtaining of the testimony of the purchaser or other respectable persons, in your county, in which case you can use the above form or affidavit, sufficiently modified to suit circumstances.

I am not authorized to require the above named affidavits, but I request them, *as a means to secure to both State and purchasers their rights.*]

The plats returned to this office will be on the same scale, and similar to those you receive.

You will designate townships, ranges, sections, etc., in the same manner as they are designated by the United States Surveyors.

You will note the variation of the needle, and express your courses from the true meridian.

[You will certify that you have made the surveys in accordance with these instructions, and give the topography of enough of the adjacent lands to enable me to judge the fact.]

It is made your duty to present to me plans and suggestions for the draining of marshes, prevention of overflows, etc., and you are therefore desired to do the same, and accompany them with an approximate estimate of the expense of constructing the necessary levees and drains.

The Act requires you to transmit to this office plats and field notes within ninety days from the date of your survey, but you are respectfully requested to transmit them monthly.

[You will head your returns, and indorse the same, as follows:

Swamp and Overflowed Lands.

----- County.

Survey No. 1, 2, 3, etc.

Township 1, 2, 3, etc. North or South.

Range 1, 2, 3, etc., East or West.

Section 1, 2, 3, etc.

North, South, East, or West half, or N. E., N. W., S. E., or S. W. quarter, etc.

Number of Acres -----.

Surveyed for -----, by -----,

County Surveyor.

Date.

You will keep these surveys, and return them entirely separate from others, and write on the outside of the envelope, "Swamp and Overflowed Lands."]

Please acknowledge the receipt of this Circular immediately, and send full directions for addressing you. By doing so you will comply with the requirements of both courtesy and duty, and greatly oblige,

Very respectfully your ob't serv't,

S. H. MARLETTE,

Surveyor-General.

To -----, Esq.,

County Surveyor, ----- County.

APPENDIX C.

1. SUBSTANCE OF APPOINTMENT AND INSTRUCTIONS UNDER WHICH COUNTY BOUNDARY SURVEYS HAVE USUALLY BEEN MADE.

The County Surveyor of the county whence came the application, has been invariably appointed subject (almost invariably) to the following conditions, viz:

To obtain and forward immediately to this office, the certificate of the Board of Supervisors and the County Judge, and so far as practicable, of the members of the preceding or the succeeding Legislature, that they had entire confidence in the competency and reliability of their County Surveyor, and that he would faithfully discharge the duties intrusted to him.

To comply strictly with the Acts concerning the office of the Surveyor-General and of County Surveyor, so far as said Acts were applicable to the case, and "if practicable without adding too much to the time and expense of the survey," to "connect by triangulation or my measurement with the United States' Surveys, and with the prominent and well known peaks of the surrounding mountains;" also "to construct as accurate, extensive and complete a map [the scale was designated to secure uniformity] of the surrounding country, as might be found practicable without too great an expense; also to "set *substantial and plainly visible stakes or monuments*, properly marked with the *names* of the *counties* and the *distance* from the *initial point*, *every mile* and *oftener when necessary – particularly* at the crossings of road , trails, streams, ravines, mountains," etc.

To send in with his map and field notes a "written description of the country traversed in making the survey," and his accounts certified to himself and "approved by the Board of Supervisors, and by the County Judge."

He was informed that as the last Legislature made no appropriation for County Boundary Surveys, he must look to the succeeding Legislature for compensation and was required, in case of appointment was accepted, to transmit the requisite certificate immediately. In case he declined he as requested to pass the appointment over to the Board of Supervisors, which Board was authorized to substitute some Surveyor who would comply with all the above conditions.

2. REPORT ON SURVEY OF SIERRA COUNTY BOUNDARY.

DOWNIEVILLE,
Sierra Co., Dec. 16, 1855.

Sir:

Having been duly appointed by you, as Deputy Surveyor, for the purpose of establishing the boundaries of Sierra County, I beg leave to submit the following report:

Having, on the 5th of November last, received from the Board of Supervisors of this county, a certified copy of my appointment, and of the instructions accompanying the same; and relying with confidence upon the liberality and generosity of the members of which the ensuing Legislature is to be composed, I at once, with the least possible delay, made all the necessary preparations for complying with the duties assigned me. Accordingly, on the eighth of the same month, having procured a theodolite, together with a surveying compass belonging to myself, employed subordinates, procured mules, collected and arranged camp equipage, provisions, etc., I proceeded to the mouth of the Middle Yuba, where I arrived on the 9th. Took observations for magnetic variation, the result of which, (being 16° 15' E.,) I assumed as the data by which to commence my survey.

On the 10th I commenced at the center of the Main Yuba, opposite the mouth of the Middle Yuba, and following up the meanderings of the last named stream ran ten miles, at which point I established a permanent and plainly visible monument.

From this station I proceeded with the survey of the line between Yuba and Sierra Counties, in conformity with the Act approved April 16th, 1852, in a direct line to Cut Eye Foster's Bar, on the North Yuba; thence in a straight line to the Lexington House, situated on the summit of the ridge which divides the waters of the Yuba and Feather Rivers, leaving said house in Yuba County. At both of these points I erected permanent monuments, also at the crossings of all streams, ravines, trails, roads, etc., likewise at short intervals along the entire line so that it can be traced with facility.

At the Lexington House I took another set of observations for magnetic variation, and the result being the same as that taken previously, was confirmation of its correctness. In consequence of the supposed (and I believe satisfactorily proved) inaccuracy of Eddy's observations for latitude and longitude, and not having in my possession the necessary instruments for determining the same, I found it absolutely necessary to correct my work with some point, the latitude and longitude of which had been correctly determined; for without this, the eastern boundary of the State, which is the terminus of the line between Sierra and Nevada, could not be established. I therefore ran a random line from the Lexington House to the north-east corner of Township 17 north, range 6 east, of the United States surveys, based upon the meridian and base line of the south peak of Monte Diablo. The length of random line bearing and distance to, and latitude and longitude of, the Lexington House, and other points, I will append in a tabular form.

Having completed the connection line, I returned to the initial point of the line, between Yuba and Sierra Counties, on the Middle Yuba, and ran the line between Sierra and Nevada Counties, (in conformity with chap. 152, sec. 20, of the Compiled

Statues,) up the center of said stream, to the mouth of Wolf Creek, this being the point from which the statute determines the line to run "easterly in a straight line," (which, of course, means due east,) to the eastern boundary of the State. I made my calculations and found the distance to be forty-three miles and fifty one-hundredths. Before proceeding further, however, I ran a random line to Galloway's Ranch, to ascertain how Eddy's observations for latitude and longitude, taken at that place, compared with my work. Having completed the connection, and finding that the difference in latitude was not great, I considered that the survey was correct, although the difference in longitude was very material. I then returned to Wolf Creek; and having taken the necessary observations to determine the true meridian, I produced a line at right angles thereto, to a distance of two miles, when, perceiving that I was beyond the influence of the strong local attraction existing at the mouth of Wolf Creek, and having taken observations for magnetic variations, the result of which was fifteen degrees east, I continued the survey to a short distance beyond Eureka, south; at which point I arrived on the 29th ult.; when, in consequence of a severe fall of snow, rendering it impracticable to proceed across the Sierra Nevada, I was compelled to close the survey for this season. I, therefore, returned to this place on the 30th; since which time to the present date, I have, assisted by Isaac E. James, Esq., Civil Engineer, been constantly employed in the construction of a map of the survey, to which I have added the location of such other points, towns, peaks, streams, roads, etc., as I knew the positions of from actual surveys previously made by me.

The Act defining the northern boundary of Sierra County is so ambiguous that it is next to impossible to ascertain by it the intention of the Legislature. But I have a letter from the Hon. James H. Gardner, (a copy of which I append), in reply to a note that I addressed to him; and he, having been one of the framers of the bill, I am of the opinion that his construction of its meaning and intention is the correct data by which to be governed in surveying this portion of the boundary; for if I survey the line, following out the ridge dividing the waters of the Feather and Yuba Rivers, to its termination, and thence due east to the State line, the eastern part of this county will be a narrow strip of territory, forming a parallelogram some thirty miles in length, from east to west, and not more than eight or ten miles in breadth. It is my intention to reconnoiter this part of the boundary, so as to be able to transmit to your office an outline thereof, before the meeting of the Legislature, in order that, if you think it necessary, you can recommend the passage of a bill defining some certain point from which the line shall run due east.

This, together with my field notes and map, I beg leave, most respectfully, to submit.

I am, Sir, your obed't servant,

WM. G. STILL,
Deputy Surveyor.

Hon. S. H. MARLETTE, State Surveyor-General,

APPENDIX TO REPORT OF THE SURVEY OF THE BOUNDARIES OF SIERRA CO.

NAMES OF THE SURVEYING PARTY.

J. E. James, Civil Engineer, Assistant; A. G. Havens, R. O. Judd, C. W. Walkins, J. D. Williams, John Jayne, Subordinates.

Table showing Latitude and Longitude established by correction with U. S. Surveys.

Localities	Latitude.			Longitude.		
	°	'	"	°	'	"
Lexington House.....	39	40	56.4	121	00	24.3
Mouth of Wolf's Creek.....	39	27	46.4	120	48	03.9
Galloway's Ranch.....	39	32	14.4	120	48	24.5

Table showing the Actual Distance run with the Compass and Chain, also the Bearings and Length of Corrected Lines.

Points From.	Bearings.	Distance actually run.	Length of correc'd line.	Points To.
		Miles.	Miles.	
Mouth of Middle Yuba.....	Per field notes.	10.00		Initial point on Mid. Yuba.
Initial point on Middle Yuba...	N 3° 45' W.	8.47	8.47	Cut Eye Foster's Bar.
Cut Eye Foster's Bar.....	N 7° E.	10.50	10.50	Lexington House
United States Survey.....	N 27° 11' 07" E.	33.58	25.75	Lexington House.
Initial point on Middle Yuba...	Per notes.	17.19		Mouth of Wolf Creek.
Mouth of Wolf Creek.....	N 3° 22.5' W.	9.43	5.38	Galloway's Ranch.
Mouth of Wolf Creek.....	E	3.75	3.75	Suspended Survey.
Total distance run, miles.....		92.92		

Expenditures on the Survey of Boundaries of Sierra County.

W. G. Still's services, one and a half months, at \$500.....	\$750 00
Necessary expenses.....	150 00
J. E. James, forty days.....	200 00
A. G. Havens, twenty-three days.....	115 00
R. O. Judd, " ".....	115 00
C. W. Watkins, " ".....	115 00
J. D. Williams, " ".....	115 00
John D. Jayne, " ".....	115 00
All other expenses.....	313 60
Total.....	\$1,988 60

Estimated number of miles required to be run to complete the Survey of the entire boundaries of the County –

On the line between Sierra and Nevada.....	39.76
“ “ “ Plumas.....	50.00
Total.....	<u>89.76</u>
Estimated expenses for running the same.....	\$2,000 00
Total appropriation necessary to cover the expense of the surveys made, and estimated cost of completion.....	3,988 60

Copy of a Letter from the Hon. James H. Gardner.

SAN FRANCISCO, Nov. 10, 1855.

To G. STILL:

Dear Sir:

Your letter of the 7th instant has been received, and in reply hereto, will state that neither McKibben or myself were sufficiently acquainted with the topography of a portion of the county now in dispute, as to enable us safely to make the dividing ridge, or ridges, between the Feather and Yuba Rivers, constitute for their entire length the boundary lines of the two counties.

Our intention was, that the line after leaving the Lexington House should keep the dividing ridge so long as the ridge ran in a northerly direction; where it ceased to do so, there occurred the point of departure for the eastern line.

Hoping that this is sufficient to enable you to determine that point,

I remain, respectfully,
Your obedient servant,

JAS. H. GARDNER.

Description of the Country on the Line of Survey.

The Middle Yuba enters the Main Yuba nearly at right angles to the latter, between almost perpendicular walls of granite. The cañon through which it flows, from this point to Hess' Crossing, is exceedingly steep on either side; the stream frequently passing between perpendicular ledges of rocks, and had not my survey been made at a low stage of water, which permitted me to pass such places by wading up the stream, it would have been difficult to have performed it.

At Hess' Crossing the slopes are much more gentle, and a good wagon road crosses here, making the descent to the river, down the divide, between Oregon Creek and the Main Yuba. From the mouth of Oregon Creek to Emory's Crossing the slopes

are more gentle than from the same point down; but from Emory's to the initial point, the cañon assumes its former character, being steep and almost destitute of timber. From this point, the line between Yuba and Sierra Counties passes, first a high and steep bank to Spring Valley Ranch, situated on the wagon road from Downieville to Nevada. This ranch contains not more than two or three acres suitable for cultivation, and has a scattered growth of pine and oak from this to Grizzly Creek.

Between Grizzly and Oregon Creeks is a narrow ridge; and about one-fourth of a mile to the east, Kentucky Hill Diggings are situated. These are surface diggings, and are reported to be very rich. The miners have built quite a town, composed of log cabins.

Oregon Creek, at the point crossed, forms a very deep cañon, with precipitous and rocky bluffs on either side. On the north bank I found large quantities of natural magnet, or loadstone. From this line passes over a series of small, sandy ridges and ravines, covered with a sparse growth of scrub oak and pine, until it arrives at Oak Valley. This is a rich mining locality, situated at the head of a branch of Willow Creek, and one mile south of Cut Eye Foster's Bar. The entire ridge for several miles below and above this place, so far as prospected, has proved to be a valuable mining region; but the entire absence of water, for mining purposes, is the cause of a greater portion of it not being worked. The North Yuba, at the point crossed, has been tolerably well "panned out." Immediately below the line, a small wooden toll-bridge spans the river, connecting the trail from Oak Valley with the Eureka Trail. Cherokee Creek, an inconsiderable stream, empties into the Yuba immediately below the bridge, whose sources are small springs on the divide between the North Yuba and Cañon Creek, about three and a half miles from its mouth. Grizzly Hill, on its east bank, and Brandy City, upon the ridge between this and Cañon Creek, are extensive mining districts. At Brandy City they are erecting quite a number of neat wooden tenements. The streets are laid out in regular order, and there is every reason to support that it will, in a short time, become a flourishing mining town.

The next point is Cañon Creek, correctly named, for we had to send our pack mules some fifteen miles off course to find a crossing. The banks of this stream rise at an angle of forty or fifty-five degrees, to the height of over 1,000 feet from the bed of the creek; and in some places the stream runs between perpendicular bluffs, several hundred feet in height. We next came to Rock Creek, a small stream that empties into the last named creek a short distance west of the county line. Between this and Cañon Creek, one-fourth of a mile to the east of the line, in Council Hill; and about one mile and a half north-east, on the same ridge, is Scale's Diggings, both extensive mining localities.

From this to Slate Creek, the country is broken and rugged, interspersed with ravines and occasional patches of fertile soil. Rose Valley Ranch and Gold Valley Ranch, are small and fertile. At the head of a small stream, running through the latter place, is Poverty Hill, a new and apparently flourishing little town.

We next cross Slate Creek, having high banks, covered with a thick undergrowth of stunted shrubbery. Upon the north side we crossed a ditch which brings water from Feather River to Barnard's Diggings. These diggings are extensive, and are said to yield well; they are situated about two miles east of the line. From this to the Lexington

House is one complete dense mass of chaparral, which we found particularly destructive to our "unmentionables."

The character of the country, from the initial point on the Middle Yuba to the mouth of Wolf Creek, is very much the same as that given of the same stream below.

Respectfully, yours,

W. G. STILL.

To the Hon. S. H. MARLETTE, Surveyor-General.

APPENDIX D.

CIRCULAR TO, AND REPORTS FORM, COUNTY SURVEYORS.

CIRCULAR TO COUNTY SURVEYORS.

SURVEYOR-GENERAL'S OFFICE,
Sacramento, July 16, 1855.

Sir:

I respectfully call your attention to the following extracts from the laws defining the duties of your office, in connection with that of the Surveyor-General:

First. From "An Act concerning the office of the Surveyor-General, passed April 17, 1850."

"Sec. 9 he shall deliver to the Governor, annually, on or before the fifteenth of December, his Report, which shall contain:

1. An accurate statement of the progress he may have made in the execution of the surveys enjoyed on him by law, and in the preparation of the map of the State.
2. Plans and suggestions for the improvement of the internal navigation of the State, and for the construction and improvement of roads, turnpikes, railroads, canals and aqueducts; also, plans and suggestions for the planting, preservation, and an increase of forests of timber trees, for the draining of marshes, prevention of overflows, and the irrigation of arable lands, by means of reservoirs, canals, artesian wells, or otherwise.
3. An estimate of the aggregate quantity of land belonging to the State, and the best information he may be able to obtain as to the characteristics of the same.
4. An estimate of the aggregate quantity of all lands used for, or adapted to, tillage and grazing within this State, and each county of the State, together with a description of the locations in which the same may be situated.
5. An estimate of the aggregate number of horses, cattle, sheep and swine within the State, and each county of the State.
6. An estimate of the aggregate quantity of wheat, rye, maize, potatoes, grapes, and other agricultural productions of the preceding year, together with his views as to the presence, cause and remedy of any diseases, or other mischief, preventing a full and proportionate return and increase of the same.
7. An estimate of all mineral lands within the State, and each county of the State, and the quantity and value of each mineral produced during the preceding year, together with a description of the localities in which such minerals may be found.
8. All the facts which may be within his personal knowledge, or which he may learn from reliable sources, and which may, in his opinion, be calculated to promote the full development of the resources of the State.

Sec. 10. He shall address a circular letter to the County Surveyors and County Assessors, instructing them, and it is hereby made a part of their official duties, to use their utmost diligence in collecting information, relative to each and every matter mentioned in the ninth section of this Act, and to transmit to him, quarterly, at the seat of Government, a report in writing, setting forth the result of their inquiries.

Sec. 11. He shall with his annual report, transmit to the Governor, all reports which he may have received from his deputies as mentioned in the tenth section of this Act.”

Particular attention is requested to the second sub-section.

A careful examination of the sixth and eighth sub-sections will satisfy you that I am authorized and required to call upon you to “use your utmost diligence in collecting information relative to each and every matter mentioned” below, as I consider the same as “calculated to promote the full development of the resources of the State.”

Lands – Agricultural, mineral, swamp, overflowed, subject to overflow, adapted to tillage, grazing lands.

Timber – oak, pine, redwood, etc.

Acres and bushels of wheat, barley, rye, oats, Indian corn, buckwheat, peas, beans, Irish potatoes, sweet potatoes, turnips, beets, parsnips, carrots, onions, clover and other grass seeds, flax seed, etc. Melons, cabbage, pumpkins, etc.

Pounds of wool, beeswax, honey, butter, cheese, sugar, rice, tobacco, cotton, etc.

Fruit Trees – Apple, peach, pear, plum, cherry, etc. Number and age, acres, amount of fruit.

Vineyards – Vines, grapes, and wine.

Live Stock – Horses, mules, asses. Neat Cattle – Oxen, milch cows, calves, etc. Sheep, goats, swine, etc. Value of animals slaughtered, value of poultry, etc.

Internal Improvements – Canals, turnpikes, railroads, electro-magnetic telegraphs, etc.; length, original cost, cost of repairs, income, profits, etc. Incorporated bridge companies, toll bridges, ferries, etc.; amount of stock or cost, income, etc. Artesian wells; number, depth, cost, discharge, kind and thickness of strata bored through, etc.

Steam and other Grist and Saw Mills; kind and amount of grain ground, run of stone, amount of flour, meal, etc.; kind, amount, cost and value of lumber; original cost, expense of running, profits, etc.

Quartz Mills and Mines; cost, value, etc.; tuns of quartz crushed, cost and yield per tun.

Manufactures.

Any Meteorological Tables or Observations – In short, all important facts you may be able to obtain, will be very acceptable.

Please state the number of miles of boundary of your county, necessary to be surveyed prior to January 1st, 1857, and the probably expense of the same.

I will be obliged to you for any suggestions for the improvement of the boundaries of your county, by substituting natural for artificial [arbitrary] ones, or the lines of the United States surveys for the present lines, or any other changes with a view to a better and more permanent subdivision of the State.

Second. From “An Act prescribing the duties and fixing the compensation of County Surveyors,” passed April 9th, 1850.

“Sec. 13. Each County Surveyor, immediately after making any survey, except surveys of city or town lots, shall make out a copy of the field notes and plats, and transmit the same to the Surveyor-General, indicating plainly upon the plats, at what point of any line, any river, or stream or any county line is touched or crossed.

When called upon so to do, he shall communicate to the Surveyor-General such information concerning surveys made by him, and other matters connected with the duties of his office, as may be required.”

Under this Act you will perceive that it is your duty to furnish to this office “a copy of the field notes and plats” of all roads surveyed by you, and it is certainly very desirable that the Act should be complied with in this particular.

I respectfully request that you will examine carefully the Act concerning Roads and Highways, passed by the last Legislature, and present any suggestions for its improvement you may deem of importance. Should not the property tax be larger? I send you a copy of my Annual Report, and would call your attention to, and ask any suggestions for, the improvement of my proposed road system.

Third. From “An Act to provide for a map of the State of California.”

“Sec. 3. County Surveyors are hereby required to connect all surveys made by them in their respective counties, with, and to some known points, to be determined astronomically, or by connection with the United States Surveys, whenever practicable, under the direction of the Surveyor-General, and report the same to the Surveyor-General, in accordance with the provisions of the ‘Act prescribing the duties of County Surveyors, passed April 9th, 1850.’”

Fourth. From “An Act to provide for the disposal of the five hundred thousand acres of land granted to this State by Act of Congress,” passed May 3, 1852.

“Sec. 12. The County Surveyors of the respective counties of this State, at the end of every three months from the taking effect of this Act, shall make out, and forward to the office of the Surveyor-General of the State, without fee for the same, a duplicate copy of each plat, or survey and certificate of the location of any land warrant made under the provisions of this Act, in their respective counties; and for a failure so to do, shall be liable to a fine of not less than five hundred nor more than five thousand dollars, recoverable before any court of competent jurisdiction, on the complaint of any person or persons in interest.”

The following extract and circular will be useful to you not only in locating School Land Warrants, but in selecting the balance of the five hundred thousand acres granted to this State.

[Extract from a Communication from the Commissioner of the General Land Office, dated November 16, 1853]

“The eighth section of the Act of the 4th of Sept., 1841, making the grant of 500,000 acres to the States for Internal Improvements, requires that the selections shall be made in such manner as their respective Legislatures shall direct; to be located, however, ‘in parcels, conformably to sectional divisions, and subdivisions of not less than three hundred and twenty acres in any one location,’ ‘at any time after the lands of

the United States, in said States respectively, shall have been surveyed according to existing laws.' Inclosed I send you a copy of the Circular of Instructions from this office, issued under this Act, and dated the 6th of August, 1847; by a careful adherence to the requirements of which, much future embarrassment may be obviated. The fifth section of this Circular requires 'that the selecting agent should file in your office an authenticated copy of his letter of appointment, or other satisfactory evidence of his authority.' You will, therefore, carefully observe that each of these State Warrants bears upon its face evidence of the authority of the party by whom the application for location may be presented, to select lands for the State under the eighth section of the Act of 4th September, 1841.

The date when these warrants are filed in your office, and the simultaneous application to enter, becomes the date of the selection by the State; it follows, therefore, that no one one hundred and sixty warrant can be located, as the law required the selections to be made in parcels of not less than three hundred and twenty acres. Two or more one hundred and sixty warrants, however, though in different hands, may be located at the same time upon contiguous lands. By this, I mean at the same instant of time. Thus, two or more warrantees may make conjoint application to enter a body of land equal to the value of their warrants; but a holder of one one hundred and sixty acre warrant cannot at a later period, even of the same day, located a tract, though it may be contiguous to land previously selected.

Accompanying this, I send you a form of a list to be used by you in reporting these selections to this office for approval. You will send up these lists, accompanied by the warrants of the State, upon each of which the locator must indorse his application to select, which application will supersede the necessity for their signing the printed form at the bottom of the list. When these lists have been examined at this office, such of the selections embraced thereby as are valid, will be certified to the State. This office does not recognize the warrants of their assigns in any other light than as the agents of the State, and no patents will be issued to them.

You will be pleased to caution the locators against selecting any swamp or overflowed lands, as all such will be certified to the State, under the Act of 28th September, 1850. I am, Sir,

Very respectfully, your obedient servant,

JOHN WILSON, Commissioner.

WM. W. GIFT, Register of the Land Office, Benicia, California."

[Circular to the United States Registers.]

"GENERAL LAND OFFICE,
Nov. 16, 1853.

WM. W. GIFT, Register of the Land Office, Benicia:

Sir:

Herewith you will receive a copy of the eighth section of the Act of the 4th September, 1841, entitled 'An Act to appropriate the proceeds of the sales of the public lands, and to grant pre-emption rights.'

In order to facilitate the business of State selections under this Act, I have to draw your attention to the following:

1st. The whole area to which the State of ----- is entitled under this law is ----- acres.

2nd. The Act requires the selections to be 'in parcels, conformably to sectional divisions and subdivisions of not less than three hundred and twenty acres in any one location,' etc.

Under this requirement a selection may include a whole section of a fractional section; or an island containing three hundred and twenty acres, more or less; *provided*, the State, where the quantity is less than the prescribed number of acres, will agree to accept the same for, and in lieu of, a tract containing the full quantity of three hundred and twenty acres, but not otherwise.

Or it may embrace –

The east, west, north or south half of a section, or two adjoining quarters of different sections, or any number, even of the smallest legal subdivisions of different sections; *provided*, the tracts selected adjoin each other, and form compact parcels, containing together not less than three hundred and twenty acres.

3rd. The selections must be based upon the official township plats of the public surveys, which are required to be approved by the Surveyor-General, and on file in the local Land Office, at the time of filing the selection.

4th. The law allows selections to be made upon public lands, whether offered or unoffered. But no State selection is admissible upon any land to which a pre-emption, or other valid claim shall be legally established, nor on any land to which 'is, or may be reserved from sale by any law of Congress or proclamation of the President of the United States,' nor upon any tract which is reserved or withdrawn from the market for any purpose whatever.

5th. The selecting agent of the State should file in your office an authenticated copy of his letter of appointment, or other satisfactory evidence of his authority; and it is important and necessary that he should make such careful and thorough preliminary examination as will enable him to select lands to which there may exist no valid claim by pre-emption or otherwise, and to avoid the embarrassments and delays consequent upon such conflicts, you will also examine the plats, records and papers in your office, before the lists of lands so selected are filed, and see that such selections are in all respects free from such objections.

6th. If, notwithstanding such precaution, the State shall hereafter select lands which shall be found to be interfered with by any prior and better claim or claims, the selection to the whole extent of such claim or claims, will of course be null and void; and if such valid claim or claims shall only extend to a part of the selection, by the rejection of which, the remaining portion or portions shall be reduced to one or more detached bodies below the quantity of three hundred and twenty acres, the part or parts not interfered with, may nevertheless be confirmed; *provided*, the State will accept each detached parcel which may thus be reduced to less than here hundred and twenty

acres, as equivalent to, and in lieu of the full quantity of three hundred and twenty acres; otherwise, such parts or parcels will be rejected, on the ground of the land not forming the compact parcel required by law.

7th. That the action of this office may be uniform, it is hereby determined, from the date of this circular, that when selections are reported to this office, which are found to conflict with the declaratory statements of pre-emptors, the approval of that part of the selection thus covered by such statement, together with such portion as may not be interfered with, but which would be less than three hundred and twenty acres, if the part covered by the declaration should be confirmed to the claimant, will be suspended, to await the final result of the pre-emption claims, which if not established at the expiration of the period allowed by law, the selection of the State will then be approved.

8th. Should a tract of land be selected by the State, and rejected on the ground of not forming the compact parcel required by law, it is no bar to its being re-selected, provided other land, not interfered with, is selected in connection with it, so far as to form the compact parcel of three hundred and twenty acres, or more, as the case may be. Should such re-selections be made, they are required to be embraced in an entire new list, bearing the number of the series at the time of such re-selection.

Herewith you will receive the form of a list to be used for selections: This form requires the date to be given when the list is filed in your office, such date being regarded as the date of selection, so that in the event of a pre-emption or other conflict, the question as to priority of right may be properly settled. The lists should bear a regular series of numbers from No. 1, and should be signed by the agent. If the list is regular and complete you will enter up your selections on your books, and mark them on the plats, sign the official certificate as to the correctness of the list of selections, and transmit the same to this office, in order that it may be submitted to the Secretary of the Treasury for his approval.

The law of Congress allows no commissions on this business.

You are requested to acknowledge the receipt of this circular, which is designed to embrace all the material principles in previous circulars in reference to this subject, and to be your rule of action in relation to this business in future.

Very respectfully,
Your obedient servant,

JOHN WILSON
Commissioner.

Your last report for this year should reach me by the first of November next, that I may avail myself of its contents in making out mine, which must be transmitted by the 15th of December.

I would respectfully urge upon you a careful examination of this circular, and a strict compliance with its requirements.

Please write upon but one side of the paper.

Please acknowledge the receipt of this circular immediately, as a neglect to answer, heretofore, has occasioned considerable extra labor in this office.

You will confer a favor by giving full directions for addressing you, as in some cases three months elapse before I receive answers to my communications, and then only after several have been sent.

Have you received my "Instructions" for the survey of the Swamp and Overflowed Lands?

I am, very respectfully,
Your obedient servant,

S. H. MARLETTE,
Surveyor-General.

REPORTS FROM COUNTY SURVEYORS.

COUNTY SURVEYOR'S OFFICE,
Alameda, Nov. 3, 1855.

Hon. S. H. MARLETTE, Surveyor-General,

Sir:

The Assessor, from the nature of his duties, is evidently better able than the Surveyor, to furnish most of the information required by your circular; and so fully has the Assessor of this county complied with its requirements, in his report for this year, that it leaves but little for me to say.

LANDS.

With the exception of a small portion of the San Joaquin Plains, all the valley land in this county is claimed under Mexican grants. It will be impossible to tell how much of the San Joaquin Valley is embraced within this county, until the eastern boundary is established. There are many thousand acres of good sectionized land, upon which School Land Warrants could be safely located, were it sectionized by the United States. Most persons are unwilling to make locations of warrants until surveys are made.

OVERFLOWED LANDS.

There are not lands subject to overflow from fresh water. There is a strip of marsh bordering upon the Bay of San Francisco, which in some places is six or seven miles in width.

This is covered by salt water only at extreme high tides; a portion of it will in time be valuable. I have made the following surveys of this description of land:

One hundred and sixty acres, fronting upon the towns of Clinton and San Antonio, for James B. Lane.

One hundred and sixty acres, fronting upon the town of Encinal, for James F. Hibberd.

Five hundred and seventy-two and three-fifths acres, near the southern boundary of the county, for Theo. H. Scribner.

One hundred and sixty acres, near Union City, for A. H. Myers.

All the overflowed land bordering upon the estuary of San Antonio, including the tracts surveyed for Larue and Hibberd, is claimed by parties holding under a grant from the State to the City of Oakland.

MARSH LANDS.

Many claims upon this marsh land have been "taken up," but not surveyed, especially about the different landings, of which there are nine or ten. None of the above surveys were made with reference to United States township lines. The first three were made before the passage of the law relating to overflowed lands.

To carry out your instructions and make the locations correspond with the lines of the United States surveys, would require, in many instances, the running of six or eight miles merely to get a starting point. Parties desiring to purchase small tracts would object to paying for the survey of more than their purchase.

I think it would be but proper for the State to divide these lands in sections of a mile square. The lesser subdivisions would then be made at the expense of the parties purchasing. The cost to the State I think would not exceed six cents per acre.

COUNTY BOUNDARIES.

I should like to call your attention particularly to the subject of our county boundaries.

At present the description is so indefinite that it would be almost impossible to run them except by agreement. They are thus described in the statutes organizing the county:

"Beginning at a point at the head of a slough, which is an arm of the Bay of San Francisco, making into the main land in front of the Ygara Ranches; thence to a lone sycamore tree that stands in a ravine between the dwellings of Fluhencia and Valentine Ygara; thence up said ravine to the top of the mountains; thence on a direct line eastwardly to the junction of the San Joaquin and Tuolumne Counties; from thence north-westwardly on the west line of San Joaquin County to the slough known as the "Percadero;" thence westwardly in a straight line until it strikes the dividing ridge in the direction of the house of Joel Harlan, in Amador Valley; thence westwardly along the middle of said ridge, crossing the gulch one-half mile below Prince's Mill; thence to, and running upon, the dividing ridge between the Red Woods, known as the San Antonio, or Prince's, Woods; thence along the top of said ridge to the head of the gulch, or creek, that divides the ranches of the Peralta's from those known as the San Pablo Ranches; thence down the middle of said gulch to its mouth; from thence westwardly to the eastern line of the County of San Francisco; thence along said last mentioned line to the place of beginning."

The starting point is indefinite. There are many sloughs in front of the Heguera Ranches.

I believe the course common to San Joaquin and Tuolumne has never been established.

From the Percadero "westwardly in a straight line until it strikes the dividing ridge in the direction of the house of Joel Harlan," is well enough; "thence westwardly along the middle of said ridge, crossing the gulch one-half mile below Prince's Mill. The main ridge, at the nearest point, is four or five miles east of the mill, which is in a cañon that runs parallel with the ridge (at what point shall we leave the ridge to cross the cañon?) Again; "along the east line of San Francisco County to place of beginning."

The east boundary of San Francisco County is the middle of ship channel, and our starting point on the shore of the east side of the bay.

I think that some action should be taken in this matter as soon as possible, and the boundary established.

MAP.

In my last report I made a proposition in regard to furnishing a correct map of the county. As you have not replied to it, I suppose that it would be useless to make another in this.

The only toll bridge in this county connects the town of Clinton with Oakland.

Several artesian wells have been bored to the depth of two hundred and fifty, or three hundred, feet; but with the exception of the one at Thompson's Landing, no large supply of water has been obtained. The one at the landing is one hundred feet deep, and gives a fine stream.

SCHOOL LAND WARRANTS.

I subjoin a list of School Land Warrants located since the organization of the county. Duplicate copies of plats and field notes were forwarded to your office at the completion of each survey.

School Land Warrants Nos. 666 and 671, for one hundred and sixty acres each, located by James F. Hibberd, September 27, 1853.

School Land Warrants Nos. 593 and 919, for one hundred and sixty acres each, located by J. W. Dougherty, September 29, 1854.

School Land Warrant No. 71, for three hundred and twenty acres, located by James Redmond, October 14, 1854.

School Land Warrants Nos. 746 and 776, for one hundred and sixty acres each, located by William O'Connell, September 11, 1854.

Very Respectfully, your obedient servant,

H. A. HIGLEY,
Surveyor Alameda County.

BIDWELL, November, 12, 1855.

Hon. S. H. MARLETTE, State Surveyor-General

Sir:

I have the honor to submit the following report, made in conformity with the statute and your circular to County Surveyors:

LANDS.

As nearly as I can ascertain from such data as I possess, about three-fifths of this county is mineral land. Throughout the mountain regions, however, there are numerous valleys, some of considerable extent, which are being rapidly settled upon, and many farms are already in an advanced state of cultivation.

SWAMP AND OVERFLOWED LANDS.

I cannot even approximate to the amount of "swamp and overflowed lands" within this county. I have not received the township plats made by the United States Surveyors; and, consequently, do not know what they have returned as "swamp and overflowed lands." From the fact, however, that their surveys were made in the dry season, and from the information derived from what I consider a reliable source, I am satisfied that there are several thousand acres in the county which are clearly "swamp and overflowed lands," as defined by the Commissioner of the General Land Office, which have not been returned as such as by the United States Surveyors. I can give no positive, or satisfactory, information on this point, however, until I receive the plats.

From the published extracts from the report of the Assessor of Yuba County, for this year, it appears that he claims the North instead of the South Fork of the Honcut, as the boundary between this and Yuba County. This is manifestly erroneous, as by reference to the statute defining the boundaries of Yuba, it will be seen that the northern boundary line follows the dividing ridge between the Feather and Yuba Rivers "to the source of the Honcut; thence down the Honcut, etc." Now, the South Fork is the only one which has "its source" in, or can be reached by following down said ridge, the North Fork having its source north of said ridge, near Forbestown. This opinion of the Assessor of Yuba, however, has already given rise to disputes and litigation along the boundary; and will, no doubt, cause trouble at the next general assessment, unless the question is definitely settled. For these, and other plain reasons, unnecessary to mention, it is desirable that said line should be marked out as soon as practicable; and our Board of Supervisors have directed me to request you to make said survey as soon as you can conveniently do so.

The boundary line between this and Sutter County runs from a point on the bank of the Feather River, opposite the mouth of Honcut Creek, in a direct line to the most northern point of the three Buttes, and thence due west to the Sacramento River. There is a large amount of real and personal property situated in the vicinity of this line, and heretofore Assessors and the property owners have been at a loss to determine in

which county the property should be taxed; besides, a considerable amount of property has heretofore escaped taxation altogether, the owners claiming to belong to, and in some instances, (it is supposed), pretending to have been assessed in the adjoining county, when called upon by the Assessor or Collector of either. To remedy this, I was directed by our Board of Supervisors to run and mark out said line, which I did last August, and herewith transmit to you a copy of the field notes and plat of the same. The special purpose for which this survey was made did not admit of our waiting for the co-operation of Sutter County in making this survey; consequently, unless said line, as run by me, be accepted and adopted by that county, it ought to be surveyed by you, or under your direction, without delay.

ROAD RETURNS AND COUNTY MAP.

I sent you, some weeks since, the field notes and plats¹² of surveys of roads, made by me in this county. Since that time I have been engaged, when business would admit of it, in platting all the different roads upon the same sheet, and connecting them with each other, and with the United States Surveys, and with points in the county whose latitudes and longitudes have been accurately determined. Two or three short lines remain to be run, which I expect to do in a short time, to form a complete connection, which, when done, will enable me to make a tolerably complete and accurate skeleton map of the county. I will send you a copy of the same as soon as completed.

ROAD SYSTEM.

In your circular you call my attention to your "proposed road system as set forth in your last annual report." I have no "suggestions to make for its improvement," but fully approve of the same, and would be pleased to see it adopted.

The recommendation that "none but Civil Engineers be eligible to the office of County Surveyors," I particularly approve of.

A leveling instrument is more particularly necessary in the mountain regions, and I have several times been compelled, in order to select the best route, to use my theodolite, at my own expense and loss of time, no provision being made by law for payment of such services.

I have no statistical information to communicate beyond what is contained in the report of the Assessor for this county, which you have already received.

The short time that I have been in office must serve as my apology for not furnishing a more complete and satisfactory report.

Respectfully submitted,

J. W. SCOTT,
Surveyor Butte County.

¹² The plats are not yet received. S. H. M.

COLUSI, Sept. 29, 1855.

Hon. S. H. MARLETTE, Surveyor-General:

Sir:

Your circular of July 16th, 1855, is before me, and in answer thereto I beg leave to report:

1st. By order of the Board of Supervisors, I run the boundary line between this and Yolo Counties, from the Sacramento River, ten miles below the head of the Sycamore Slough, some distance into the low hills of the Coast Range, a distance of ---- - miles and ----- chains, and here the chaparral or brushwood became so dense that I could not proceed without great expense to the State. The Board directed me to go as far as any settlement would probably be made, which was done. See map herewith. See, also, field notes and plats of four roads.

2nd. A large body of land in this county could be drained and made valuable for grazing, and even for agriculture. A ditch should be cut from the most westerly bend of the Sycamore Slough (see map) in a north-westerly direction, into the marsh, which has an area of about thirty-six square miles, and can not empty itself into the slough, because the annual deposit has been greater immediately upon the banks. This ditch should be about six feet deep at the slough and half a mile long, but very rapidly losing its depth as it approaches the tule or marsh. The slough from this point should be cleared of all brush and other impediments to the end of its present channel, a short distance below the county line. From the end of the upper channel to the upper end of the lower channel, I am informed, is not more than two miles; thence to Knight's Landing the channel is nearly on a level with low water in the river. The ditch to connect the upper and lower channel would be entirely in Yolo County. Should the State adopt the policy of giving the several counties the whole or a part of the swamp lands, in consideration of the drainage of them, it would seem to be highly proper that the boundary of Colusa County should be so changed as to give this county control of the overflowing water from its departure from the river to its entrance into it again. I would, therefore, suggest that the County of Colusi be bounded as follows: Beginning at the mouth of Sycamore Slough, thence up said slough to some township or section line which would include the Buckeye Ranch, thence west to the top of the Coast Range, thence northerly along said summit to the source of Stony Creek, including Clear Lake, and all the settlements thereon, thence down Stony Creek to the Sacramento River, thence across said river and down a large slough, which heads nearly opposite the mouth of said creek, to Butte Creek, thence down said creek along its principal channel to its junction with Butte Slough, thence down said slough to some township or section line which would include Eddy's Ferry, thence west to the Sacramento River, thence down the river to the beginning. A new county might be formed of the upper end of this county, with a part of Shasta and Butte. The Buckeye Ranch is about twenty-four miles below Colusi (town) and about eight miles below the county line. Stony Creek is about

forty miles above. The eastern boundary would be the center of the swamp – impassable in winter.

3rd. This county is about ninety-four miles north and south, and about forty-five miles east and west – 4,230 square miles. The dry land which is good for cultivation, is a strip along the river about four miles wide, the whole length of the county, say four by ninety-four miles, and a strip along the base of the Coast Range from the lower end of the county to Stony Creek, about fifty miles, eight miles wide, in all equal to seven hundred and seventy-six square miles. A strip of overflowed lands extends from Stony Creek down, about six miles wide – three hundred square miles. I am not aware of any minerals in this county.

4th. Answered.

5th. The Assessor will report.

6th. “ “

7th. Answered.

8th. The immediate settlement of the land titles.

I am not aware of any law especially requiring the survey of counties prior to January 1857. The cost of surveying the southern, western and northern boundaries of this county could not be less than \$25,000.

The suggestions I have to make on the Road Law of 1855 is, that the first Section is entirely wrong. The third Section should require the *Clerk* to make out the order on appointment and the *Sheriff notify*. In the sixth Section the junior age should be sixteen years, instead of twenty-one, and the property tax is altogether too high; but if the people do not rebel against the State tax they may not against this. The words “poll tax” should be substituted for “road tax.” In the eighth Section the fifty dollars contracts should be made without waiting for the approval of the Board.

After the ninth Section another section should follow, providing for the writ of *ad quod damnum*, so that the Act shall not violate the last clause of the Section eight of the Bill of Rights. It seems to me that the Road Overseers ought only to report once a year, say at the November meeting, and that delinquents ought to be sued before a Justice of the Peace and a Constable collect the tax. In the thirteenth Section the suit ought to be instituted by the Road Overseer or any other person.

Your Annual Report has not been received at this office.

Your instructions for the survey of swamp lands, of June 13th, 1855, and also your circular of August 25th, 1855, have been received; but I have not been called upon to make any surveys under the Act of April 28th, 1855, so that I cannot give any more accurate information than the general statement made in the fore part of this report.

It occurs to me that it would be to the interest of the State to make an appropriation to employ the County Surveyors of some of the valley counties to select at once all the swamp lands in their counties, by running a zig-zag line along the edge of the swamps, and to draw maps, in which shall be shown each legal sub-division which is overflowed. To do this honestly and faithfully the Surveyor ought to be paid something more than the legal fees, as it would be necessary that he should call upon the persons living in the vicinity and take their affidavits as to the places overflowed, as the appearance of the grass, weeds, etc., is not always an infallible test.

There is a very large body of swamp land in this county, according to its present limits, but there would be a large quantity added by the alteration in the boundary as suggested above.

All of which is respectfully submitted.

C. D. SEMPLE,
Surveyor Colusi County.

¹³COUNTY SURVEYOR'S OFFICE,
Contra Costa County.

Hon. S. H. MARLETTE, Surveyor-General State of California:

Sir:

I reply to your circular under date of November 15, 1854, allow me, as regards Article first, to say, I have but recently entered upon the [duties of this] office, from the resignation of T. M. Aull, Esq., and am not prepared to report.

ARTICLE 2. As regards the streams navigable in this county, the Monte Diablo Creek is of the most note. It pursues a winding course through tule and marsh land; upon its branches are two or three embarcaderos, the Monte Diablo Lime Co. using one, and the farmers the other. There is a larger warehouse built, and more grain has been shipped at this point than from the wharf in Martinez. The stream is navigable for river craft, say forty tons, for some three miles. San Pablo Creek also admits vessels of fifteen tons, and is rendered equally useful to the farmers in that vicinity. We have good county roads connecting Martinez, the county seat, with San Pablo, the Red Woods, Oakland and San José. There has been, and is still much oak cut on land, the title to which is in litigation in many instances. The black locust and cotton-wood trees have a faster growth than any other yet introduced.

ARTICLE 3. An estimate of the land belonging to the State in this county at present, it would be impossible to make. In fact, the confirmation of Spanish grants in this county has covered the majority of arable lands.

ARTICLE 4. The estimate of tillable land in this county would reach perhaps 150,000 acres; and as regards grazing, with few exceptions, our hills furnish good cattle ranges seven months out of the year.

ARTICLE 5. The number of horses may be set down at 16,000, of cattle at 25,000, of sheep 95,000, and swine 9,000.

ARTICLE 6. The wheat raised the past season may be estimated at 200,000 bushels. No attempts have yet been made to raise rye. The crop of maize has been, as a general thing, a failure the past season. A species of worm and an insect have destroyed whole fields, attacking the grain after its formation. Little attention has been paid to potatoes, the crop may be set down at 50,000 bushels. There have been some seventy-five tons of grapes raised this season, from old vineyards. In other sections of

¹³ For 1854.

our county the vine has been stripped of its foliage, while the melon, squash and cucumber have been literally destroyed. Wood ashes have been used to no purpose; pulverized charcoal has been suggested, and in the New England States horse manure is placed in a cask, and covered with a lye water, the water then drawn off, and the plants watered with the drainage.

ARTICLE 7. Relative to minerals upon Monte Diablo; quartz has been formed, and in a lime-rock quarry at the same place, small specimens of marble, closely resembling the white marble of Pennsylvania, have been formed. The overflowed lands are estimated at 150,000 acres.

In conclusion, I would say in regard to this meager report, that I have but lately assumed the duties of the office of County Surveyor, and have surveyed but little, and unfortunately your circular, from a change in the post office department, came to hand too late for a timely report.

DANIEL SMALL,
Surveyor Contra Costa County.

LOS ANGELES, Oct. 13, 1855.

Dear Sir:

Your annual circular for 1855 came duly to hand. I have to answer, that I have not received your instructions for the survey of the swamp and overflowed lands.

Until litigation instituted by the United States Government against land owners shall be abated, and stability imparted to the character of titles to real estate in this county, so as to warrant purchases and settlements, there is no necessity for either a survey or change of county boundaries; they are for the most part natural, and have been designated so as to suit the convenience of tax payers. I have understood that the authorities of Tulare County have claimed that Rancho Tejon was embraced within the limits of Tulare County, but such a claim must be absurd, and entirely without foundation, for the language of the statute is sufficiently explicit on that point; besides, the owners of said rancho live in Los Angeles and San Diego, the natural and adopted marts of the settlers of that rancho, as also the valley of Tehachpie, situated to the north-east of said rancho, is Los Angeles.

Concerning the infinity of information, otherwise suggested by statute and requested by you, I regret to inform you that it has not been the province of my duties, or within my sphere of action as County Surveyor, to learn anything other than that I have had occasion to survey the vineyard of Don Luis Vignes, now owned by Mr. Lansevane, containing some 30,000 vines, and a variety of fruit trees, such as oranges, fig, peach, etc., etc., together with some other smaller ones, all situated within the corporate limits of the City of Los Angeles.

Respectfully yours,

HENRY HANCOCK,

Surveyor Los Angeles County.

To S. H. MARLETTE, Esq., Surveyor-General.

SAN RAFAEL, Marin Co., Nov. 10, 1855.

Hon. S. H. MARLETTE, Surveyor-General:

Sir:

In compliance with your circular of July 16, I send you the following report of this county:

This county is supposed to contain about seven hundred square miles, and is bounded by natural boundaries with the exception of the distance from the Estaro Americano to St. Antonio Creek; that portion of it is bounded by a road which is about twelve miles in length. I am unable to furnish you with a map of this county without a survey of the county lines; this I am unable to do at my own expense. About two-thirds of this county is suitable for cultivation and grazing. There has not been any School Land Warrants located in this county the past year, or any swamp, or overflowed, lands, belonging to the State. There is but little swamp in this county; there are some thousands of acres of salt marsh in the north-eastern part of the county on the margin of creeks and of the bays; this is supposed to belong to the State, but to reclaim them it would cost more than the land is worth. These lands have been surveyed by the United States. The principal timber in this county consists of redwood, pine and oak; there are some four thousand acres of land covered with redwood timber. Most of this land is supposed to belong to the United States; and is situated near Tamel Pise Mountain and about Daniel's Creek, in the township of Bolinas. There are four steam saw-mills in this county; three of them are in Bolinas, where the greater portion of lumber is sawed and shipped from.

There is a large bay in Bolinas, where vessels of a light draft of water, say six to seven feet, can come in and be safe from all winds. This place is in the southern part of the county, and is not laid down in the State map, although this bay is about three miles in width and three and a half in length. There have been no public improvements made in this county since it has had the name of a county although there are \$15,000 raised in taxes yearly. No roads made, or bridges built. In the winter season the roads, if you can call them by that name, are dangerous both to man and beast, to travel, on account of the many arroyas which run across the road; all these places could be made passable, by bridging, at a very small expense. The county is now about \$5,000 in debt, and is unable to do anything towards improvements. Some part of this county has been townshipped, but no part of it sectionized.

I would estimate the number of

Horses.....	3,000
Cattle.....	8,000

Sheep..... 4,000

Fruit trees, 2,500, from three to four years old; the most of them are apple and pear trees. This year they have borne about ten bushels of the very best quality of apples and pears. The wheat crops have all been destroyed by rust and smut. Barley has done very well; the number of bushels I am unable to state. Vegetables are cultivated to a considerable extent, sufficient for domestic consumption. There have been three roads surveyed in this county, the field notes and plats I have sent to your office.

I have received your Annual Report, and have also examined your proposed road system, and think it ought to be adopted.

Very Respectfully,
Your obedient servant,

ALFRED D. EASKOOT
Surveyor Marin County.

MERCED RIVER, Nov. 1, 1855.

Hon. S. H. MARLETTE, Surveyor-General:

Sir:

According to instructions received by me from you, requesting information, I beg leave to submit the following:

Merced County is an agricultural and grazing county, there being very little mining land in the county. The surface is generally level, with very little timber, which is principally oak and willow. Of the amount of swamp and overflowed lands I have no means of estimating. The crops in this county have been very light this season, owing to the want of rain. A large portion of wheat was injured by smut, which will cause many to abandon its culture. There is not fruit raised in this county; there is no use of planting fruit trees, or any other trees, unless the land is irrigated; the grasshoppers would destroy them. They do very little damage on land that is well irrigated.

The line between Merced and Mariposa Counties, I think is not satisfactory to both parties, it being the main road leading to the San Joaquin River, which is very crooked, and changes, perhaps, every three months. I would suggest a line to commence at the south-west corner of Tuolumne and the south-east corner of Stanislaus Counties, running in a straight line to Phillip's Ferry, on the Merced River; from thence in a straight line to Convers' Ferry, on the San Joaquin River; from thence south in a straight line to the line of Tulare County. This line would run diagonally across the lines of the United States surveys for the greater portion of the way. I have not made any surveys yet.

Respectfully, your ob't serv't,

ERASTUS KELSEY,
Surveyor Merced County.

COUNTY SURVEYOR'S OFFICE,
Nevada County and City, Oct. 29, 1855.

Hon. S. H. MARLETTE, Surveyor-General:

Sir:

Agreeably to instructions per circular in August last, I beg leave to submit the following report of Nevada County:

The agricultural land is by no means extensive, for it is at present confined to the valleys and ravines alone; in time, when canals shall traverse out highest hilltops, the coarser grains may be raised in great profusion. There are no swamp or overflowed lands in the county. Tillage and grazing land is abundant, but it requires artificial means to make them profitable, (irrigation.) The staple of the county is mineral, and, I may add, timber, of which I will speak in their proper places.

The quantity of land claimed as pre-emptors, and surveyed, amounts to about 30,000 acres. There is no possibility of my getting at the quantity claimed by parties who have had no survey made; and there are many such, who say the law does not compel them to get their land surveyed by a County Surveyor; so they pace round their pre-emptions themselves, get them recorded, and feel secure in their titles. You see, sir, how impossible it is for me to come at anything like a correct estimate of the quantity of land claimed by actual settlers, or the number of acres under cultivation.

TIMBER.

Pine, oak, with some spruce and cedar. The pine is the most abundant and profitable.

The number of acres under cultivation may possibly reach 4,300, of which there are of

	Acres.
Wheat.....	1,100
Barley.....	1,500
Oats.....	350
Corn.....	50
Hay.....	700
Potatoes.....	300
Other vegetables.....	300

Of flax there is none, nor hemp, neither sugar, rice, cotton or tobacco.

Fruit trees, particularly the peach, will flourish in this county, but as yet none have been brought to perfection.

	No.
Horses and mules.....	1,500
Cattle.....	2,300
Swine.....	7,800

INTERNAL IMPROVEMENTS.

We have somewhere in the vicinity of seven hundred miles of ditches for supplying the mines with water, and now being constructed; valuation of those in operation, \$350,000. The price of water as sold to the miners will average fifty cents per inch.

ROADS.

There have been surveys made of roads in the county, by me predecessor, but in the absence of field notes or maps of the same in my office, I am unable to say anything on the subject.

There are no railroads in the county.

There is one electro magnetic telegraph, terminating at this place, which not unfrequently notifies us of the arrival of the mail steamer before she reaches her wharf in San Francisco. I am informed the line is being extended to Downieville, in Sierra County; its length will then be through the entire county of Nevada, from south to north. As yet it has declared but small dividends.

There are eight toll bridges in the county.

The number of ferries I am unable to state with accuracy; they are mostly being done away with, and substantial bridges constructed in their stead. Those already passable are valued (as per information from an efficient Assessor) at \$26,300.

The number of quartz mills in successful operation are sixteen, five of which are run by water. The quantity of ore crushed per annum, 75,000 tons; average yield per ton, twenty-five dollars; cost of quarrying, hauling and crushing per ton, fifteen dollars; aggregate value of machinery, \$300,000.

The total amount of original investments in quartz, is estimated at \$2,000,000. this amount will be doubled in a few years, for it is proved beyond dispute, that our quartz veins are not only remunerative, but inexhaustible. At the very lowest calculation I put the annual yield of gold in the county at \$5,000,000.

We have lime rock too, which is pronounced superior to any in the State, and in great abundance.

There are in successful operation thirty-two saw mills in the county, with an average cutting of 1,000,000 feet of lumber annually; valued at thirty dollars per thousand, and the number of mills increasing monthly. About two-thirds of the entire county is one vast forest of pine, spruce, oak and cedar.

There is one grist mill with a capital of \$25,000, and turning out 5,000 barrels of superior flour per annum, valued at \$60,000, and grinding also some twenty tons of barley per month.

I have not kept, neither have I seen, a meteorological diary of the weather, but I have seen the mercury at one hundred and eight in the shade; and again, ten degrees below zero. In the hottest of our weather I have experienced no great inconvenience, even in the field, the air is too pure for fatality.

Upon entering the duties of my office in May last, I was somewhat surprised to find we were without a map of the county, neither a field note of any kind excepting pre-emption claims; the Clerk's office is without a county map. As near as I can learn, the county lines are thus: Commencing at Yuba River, mouth of Deer Creek, and running south to Bear River, (which line my predecessor tells me was run himself and the Surveyor of Yuba County,) which is the only line run; thence up Bear River (natural boundary between Nevada and Placer counties) to its source. Commencing again at the mouth of Deer Creek and running up the Main Yuba to the mouth of the Middle Yuba, thence up Middle Yuba to the mouth of Wolf Creek, thence from the mouth of Wolf Creek due east to the State line. Now, if I am correctly informed, and from personal observation I think I am, I most respectfully suggest that the last named line may be so altered as to read thus: "Thence up the Middle Yuba to the mouth of the North Fork of the Middle Yuba, thence up said North Fork of Middle Yuba to its source, thence north-east to the State line."

I have two reasons for this change; the first is, that a due east course from the mouth of Wolf Creek to the State line, will place Eureka in Sierra County, to which fair play, and the people themselves, object; for in the winter season it will be impossible for them to get to their county seat, (Downieville,) when Nevada can be reached at all times. And again, a due east course from the mouth of Wolf Creek, I am inclined to think, will intersect with Placer County before reaching the State line, on the summit of the Sierra Nevada; in the second place, by making the North Fork of the Middle Yuba to its source the line between Nevada and Sierra Counties, and thence north-east to the summit or State line, we will not only have what I think just and right, but will secure to us what we have always called our town – "Eureka." The north-east line will not require to be run at present, for it is far beyond the inhabited part of the State.

I would recommend that a survey be made of the entire county, and a topographical map drawn of the same, which I should think might be done accurately for \$2,000. As I am now I can hardly say where Nevada County is, and am still more in the dark as to the whereabouts of the township lines.

If not out of place, I will here say that an Immigrant Road, of which so much has been said and written, might through this county find an easy grade, either to Carson Valley, or to the valley through the summit, in which the Middle Branch of Feather River springs. I am of the opinion that a reconnaissance for a road, either from Bear Valley or from Eureka, would meet with success. In the spring of 1850 I was in the valley referred to as crossing the summit, and if I mistake not, it now goes by the name of the American Valley. It comes into the Truckee Immigrant Road not far from the Donner Cabin, east of the summit. From explorations since the spring of 1850, I am pretty well convinced of the success of a reconnaissance for a road to that point.

Yours respectfully,

JOHN DAY,

Surveyor Nevada County.

QUINCY, August 2, 1855.

Hon S. H. MARLETTE, Surveyor-General:

Sir:

Your circular of June 13th, published in the *Daily Democratic State Journal*, and sent me through that medium, was duly received. In compliance with its requirements, I have briefly to state, that it is not in my power to give you any reliable information concerning the swamp and overflowed lands of this county. The United States surveys have not been extended to this county. The country is mountainous, and interspersed with valleys, but few of which, owing to the prevalence of frost during the summer, are adapted to agricultural purposes; of these, the American and Indian Valleys may be considered as the principal ones. To these my official labors have been almost exclusively confined. The former contains about five thousand acres, the latter near twenty thousand acres of land, the whole claimed and occupied by actual settlers. A considerable portion of these valleys might be called swamp lands. Much of this land has already been reclaimed by the owners, and I think the remaining portions of it will be in a few years.

A few School Land Warrants have been located in both American and Indian Valleys. Owing to the existence of gold in almost every place here, in the valleys as well as the hills, it is my opinion that all the land will be regarded by the United States authorities as mineral land, and that the General Government will not cause it to be surveyed. Indeed, as permanent, and in many instances very costly and valuable improvements have been made by the occupants of it, any interference with their lines as at present established, would be productive of much evil. I would suggest that the State take some measures to secure these lands to itself, and that each and every person occupying or claiming land, and producing satisfactory evidence of the amount so claimed, by paying the State a fair equivalent therefore, have a patent issued to him for it. By this means the State would secure to itself at least \$25,000, and probably much more.

Most respectfully yours,

H. CHURCH,
Surveyor, Plumas County.

COUNTY SURVEYOR'S OFFICE,
San Bernardino, October 10, 1855.

To S. H. MARLETTE, Surveyor-General:

Sir:

Having received your circular to County Surveyors, I hasten to acknowledge the receipt of it, and report to you such information in my possession, and such improvements as I think would be of great benefit to this county and the State.

The County Assessor having received a circular similar to mine, and being possessed of all statistical information of the county, and having forwarded the same to you, I did not think it necessary to prepare a similar report, as our facilities for obtaining information respecting the items mentioned in your circular are very limited, and indeed the most of them are totally impracticable.

In the first place, I would respectfully urge for your consideration, the improvement of the road through the Cajon Pass, which road leads to Great Salt Lake City. By getting a good road through this pass, it would materially advance the interests of this place, as well as a great many others. The length of road necessary to be made, would amount to about twelve miles, and the probable cost from \$7,000 to \$10,000.

In the next place, I would suggest the boring of artesian wells on the road to Great Salt Lake City, there being a number of deserts to cross over, and not one drop of water for fifty or sixty miles at a drive. I, having traveled the road, am aware of the suffering and hardships of travelers for want of water on the road. I think that water may be obtained within two hundred feet at the utmost extent, and the number necessary would probably amount to five within the boundaries of this State.

Herewith you will please receive a copy of a plat and certificates of land surveyed by me, and filed in the office of the County Clerk of San Bernardino County.

I am, very respectfully,
Your obedient servant,

ARVIN M. STODDARD,
Surveyor San Bernardino County.

COUNTY SURVEYOR'S OFFICE,
San Diego, Sept. 10, 1855.

Hon. S. H. MARLETTE, Surveyor-General:

Sir:

I have the honor herewith to transmit to you all the information relative to the County of San Diego which at present I am enabled to furnish. Such details as are not within my personal knowledge, are derived from authentic sources. No report from this county has, I believe, from any County Surveyor, ever been forwarded to you or your predecessors in office. Until the receipt of your circular of the 16th of July of the present

year, no communication from your office has reached me during the two years that I have been honored with the responsibilities of the position of County Surveyor. The following statement of the boundaries, topographical features, improvements and resources of this county, is respectfully presented to your notice.

COUNTY BOUNDARIES.

The boundaries of the County of San Diego are thus defined by law:

“Commencing on the coast of the Pacific, at San Mateo Point, and running thence in a direction so as to include the ranchos of Santa Margarita and Lajuna Ternacala (?), to the rancho of San Jacinto, and along its northern line to the north-east corner, and from thence in a parallel line with the southern boundary with Mexico, to the Colorado River; thence down the middle of the channel of said river, to its junction with the boundary line of Mexico; thence following the boundary line to the Pacific Ocean, and three miles therein; thence in a north-westerly direction, running parallel with the coast, to three miles due west from San Mateo Point; thence east, to the place of beginning.”

San Mateo Point is a few miles south of the creek of San Juan Capistrano, and is the northernmost of two small projections of land, at the mouth of the Creek of San Mateo. From that point to the north-east corner of San Jacinto, along what is described as the Lajuna Ternacala, which I supposed to mean the Laguna Temecula, the line is difficult to be defined, either upon the ground owing to want of exactness in ranch boundaries, or upon a map in absence of correct surveys.

The remainder of the northern line of the county is readily located on a map, but impossible to be traced throughout its extent upon the ground. Probably not more than two points of the line are accessible between San Jacinto and the Colorado River. These are the points at which it crosses the valley of the San Gorgonio Pass and the supposed valley of the Mohave River. This river, it is now believed, from the reports of Lieut's Parke and Williamson, does not reach the Colorado, nor cross the line of this county, but sinks in a sandy basin in a direction north-east of San Bernardino. There is no doubt, however, that a large valley makes up from the Colorado, towards the Mohave country, and its trend is nearly in the direction given on the maps to the River Mohave. From the intersection of the northern boundary with the Colorado River, the middle of that stream is the boundary, until the Mexican boundary is reached. This I think is not accurately laid down upon the maps.

The junction of the middle of the channel of the Colorado with the Mexican boundary line is not now, as formerly, at the mouth of the Gila River. The shifting of the sandy channel of the Colorado considerably to the westward, has left the former initial point of the treaty boundary, nearly a quarter of a mile up the Gila River, and consequently the junction of the former river with that boundary is something like seven miles down the Colorado, at the place where the line crosses that river, and enters upon the desert. This change in the topography I apprehend does not affect the question of the county or State boundary though the matter has been the subject of some discussion by persons interested in claims in that place. It has been alleged that the territory on the south, or Sonora side of the river, does not now belong to the State of California, but to the territory known as the “New Purchase,” inasmuch as the channel intersects the Mexican boundary at but one point, and that is where the latter leaves the

river at Pilot Knob, seven miles from the mouth of the Gila. In my surveys of that point I have considered the old boundary throughout as the proper one, and the plats of the surveys heretofore transmitted to you will be found to correspond thereto.

From the mouth of the Gila to the Pacific Ocean, the line is direct to the monument at the initial point, a distance of about one hundred and thirty-five miles, the course being (at Emory) south $85^{\circ} 34' 16.18''$ west. This boundary has, of course, been accurately run and marked, by the U. S. Commissioner throughout its whole extent, and a portion on the desert for sixty miles west of the river, has been run and marked by my myself, the boundary monuments being planted at every mile and half mile, under the orders of the U. S. Surveyor-General, in connection with township surveys in the same region.

The coast line, as laid down on the charts of the coast survey, has been copied on the official map of the State, and with the exception of the part to be referred to in a succeeding paragraph, is undoubtedly accurate.

AREA.

No estimate of the amount of territory embraced within the boundaries of this county, as defined by the Statute, can be made with accuracy; from the fact that no surveys hitherto executed have laid down the county boundary correctly. The River Colorado, which forms the eastern boundary of the county and State, is not accurately put down on the maps, nor the resulting position of the intersection of the northern boundary of the county with that river. The coast line of the Pacific, there is reason to believe, is also improperly placed on all the maps; the error, I think, originating with the reconnaissance of the Coast Survey, from which all recent maps have been constructed. On comparison with the U. S. Land Surveys, it appears to be too far to the eastward by about two miles as a maximum, at a point some twenty-five miles north of this place, the difference decreasing in both directions therefrom, until the true longitude is again finally attained.

From the recent surveys in the vicinity of the Colorado River, under the orders of the U. S. Surveyor-General, it is definitely ascertained that the general course of that stream is nearly south, from a point at least thirty miles north of its junction with the Gila. This shows an error in most of the maps up to the present time, and diminishes the apparent area of the State in a very considerable degree.

The patriotic regret that our domain is not as extensive as has been supposed is somewhat alleviated by the consoling reflection that the entire territory in that section is worth rather less than nothing; nor can a State be said to be exactly impoverished by being deprived of that which she never owned.

San Diego County is traversed from N. W. to S. E. by the mountains known popularly as the Coast Range, but more appropriately designated the California Cordilleras. This range occupies with its spurs and foot-hills and narrow intermediate valleys, about one-third of the entire county area, and contains all the agricultural land of the district, as well as a fair proportion of thickly timbered country adjacent to the sources of the San Diego River and other small streams running parallel to it. Spurs and ridges from the western slope of the mountains on the west, terminate on the coast and give a broken and rugged character to the surface; relieved, however, by the small

valleys of the different streams, which are occupied as ranchos, and when cultivated are highly productive.

From the eastern slope of the mountains to the Colorado River, is the flat and sandy wilderness called the Colorado Desert. The portion of the desert embraced in this county, consists of a belt of arid level clay and sand, to one hundred miles in width, extending entirely across it from north to south. The amount of desert land may be roughly estimated at 5,000 square miles.

Toward the northern limit of the country the mountain-ranges from the west and north, extent their barren ridges quite to the Colorado River, and apparently inclose the principal plain of the desert.

They area in this county of these mountains, which are volcanic in their origin and rocky in character, is nearly 5,500 square miles.

Approximately, the whole area of the county may be estimated at probably not less than 14,000 square miles.

SURVEYS IN SAN DIEGO COUNTY.

Since the establishment of the San Bernardino Meridian, from the initial point on that mountain to the southern boundary of the State, in 1853, the United States surveys of the public lands in this county have progressed with great regularity and expedition. From that meridian, which traverses the heart of the agricultural region of the county, the surveys of the standard parallels east and west, have been conducted, to their intersection with the coast, and also, with the exception of one, the second from the initial point, to the eastern boundary of the State.

These survey shave assisted greatly in giving us a better knowledge of the topography of this part of the State, and when the township surveys shall have been completed, a map of tolerable accuracy may be constructed, embracing much information of value to the geographer. By the lapse of another year there will probably have been obtained sufficient material in connection with local surveys, to furnish what has long been needed – a complete county map with topography placed upon it with some degree of accuracy.

The survey of the mouth of San Diego River, by Lieut. Derby, United States Topographical Engineers, in connection with that of the bay, by the Coast Survey, both of which are published with Congressional documents, gives a reliable map of these localities; and the unpublished maps of the Boundary Commission must doubtless contain valuable information. The map of Emory's Route in 1846-7, which has been often used as authority in delineating the country between the Colorado River and San Diego, I cannot recommend as entirely faultless; the existence of some of the topographical features whereof it being my duty to utterly deny. The positions of some of the prominent places near the coast are, however, accurately given on the map; and wherever careful observations were taken on the route, there can be no reason to doubt their correctness.

The trail of Capt. Sitgreaves, Topographical Engineers, down the Colorado River, ought to give, if properly mapped, the true course and position of the Colorado River.

The more recent surveys of Lieuts. Parke and Williamson, of the United States Pacific Railroad Survey, in 1854, and that of the former of the present season, will doubtless give very truthful and valuable results. The establishment of the fact of the

sinking of the Mohave River, is a feature of great interest in these surveys, and the publication of their entire report must afford much interesting matter. The survey of a railroad route for the San Diego and Gila Railroad Company, just concluded, gives additional information in regard to the topography of the mountainous region of the county, and in particular some interesting facts in relation to the heights of the different summits and passes through the mountains; and also a comparison of results of barometric observations at those points with those established by the level. By this comparison it is found that the difference of results of the two instruments is so small, that for purposes of preliminary investigations, when carefully observed, the barometer is a most valuable and reliable instrument.

OCCUPANCY OF LAND.

Large quantities of the arable and grazing lands of the county are held under Mexican or Spanish titles, and occupied by rancheros of the ancient order of shepherds and herdsmen. Many of them are averse to the changes and innovations brought about by the advent of American rule, and cleave manfully to the time-honored institutions of raw hide ropes, wooden ploughs and stumpy wheeled ox-carts. It is due to this class of our population to state, however, that in point of integrity, sobriety, and all the qualities that go to make up a peaceable, law-abiding citizen, they bear a favorable comparison with the American portion of our community. Upon the few unoccupied lands unclaimed by old grants, a number of enterprising settlers have taken up claims for agricultural and grazing purposes, and have in many instances, raised large crops of grain and vegetables with little labor.

Some of the largest and most valuable tracts of arable land in the county, are those of the old missions, the titles to which are now in litigation, which prevents their permanent occupancy, by those desirous of becoming actual settlers. The most important among this class is the Mission of San Luis Rey, situated forty miles north of San Diego, upon the river of that name, comprising thirteen square leagues of the finest soil for culture within the limits of the whole State. This mission and ground has been occupied by a detachment of United States Troops, since the possession of the country by the Americans.

The Mission of San Diego, next in importance, situated but five miles east of San Diego, containing one square league of land, though formerly embracing many valuable ranchos in the neighborhood, is occupied and garrisoned by two companies of United States Artillery. This force has prevented the taking up of the mission lands by unauthorized persons. The whole valley is used, however, in common by the people of the town for grazing purposes, according to immemorial usage. The final decision of the vexed question of proprietary titles, will aid largely in the settlement, cultivation and development of a tract of country combining more advantages of climate, soil and capability of production, than any other district on the whole Pacific Coast; add to these the convenience of access from the sea through the Port of San Diego, which in itself is an advantage not possessed by any other district south of San Francisco, and it will be apparent that as high a state of prosperity would result from the settlement of this county, as can be exhibited in any other portion of our country.

LANDS, CULTIVATION AND PRODUCTS.

Those of our population who have more recently settled among us, have bestowed considerable attention upon the cultivation of the soil, but not to the extent that is necessary to supply the wants of the local population. A few acres in nearly every rancho in the county, are planted with grain and vegetables for the immediate use of the occupants, but no systematic attempt at raising grain for our home market or foreign consumption, has yet been made. Some ranchos have an area of two or three hundred acres laid down to grain, but the larger number are devoted to stock raising, to which the face of the country is far better adapted.

The sandy plain adjoining the town at the mouth of the Mission Valley, has been cultivated in small portions with great success, and some most extraordinary crops of vegetables have been raised. Indeed everything indicates that if proper efforts were applied to this branch of industry, and greater advantages presented for the sale of the products of the soil, no county could show so abundant a harvest, a more thriving system of agriculture, or a larger proportional area of land under cultivation. It would be difficult to arrive at an exact estimate of the quantity of land now under culture, without an actual visit and inspection of each rancho and farm within the limits of the county.

That such a duty does not, and ought not, properly to belong to the County Surveyor, is needless to remark, unless that functionary is a statistical agent, assessor or census-taker also; in which case he would better serve his profession by quitting its ranks. My apology, therefore, for not incorporating with this report the various statistical data relative to the number and quantity of cattle, swine, beans, cabbage, goats, buckwheat, hay, hemp, barley, oats, onions, cheese, turnips, eggs, butter and beeswax, as contemplated by the law as given in your circular, must be, my very limited interest in matters so entirely unconnected with my profession, and confessed ignorance and want of information upon the subjects indicated, not to mention the great and unremunerated expense inseparable upon the performance of the duty. My general impression of the live stock department is, that several thousand cattle, of a fierce and savage breed, infest the valleys of this whole county, making the Surveyor's duty of running lines through their range, a matter of some personal risk and uncomfortable foreboding – (I had an unsuspecting flag man prostrated once by a charge in the rear from an infuriated bull) – that swine are not numerous, judging from the fact that pork is a rarity in our market. A similar remark is applicable to sheep and goats. On the whole, fruits, vegetables and dairy productions are not apparently plentiful, with the exception of grapes and melons, which, during the season, are more luscious and abundant than in any other locality within my knowledge. In passing over the county I have noticed, however, the capabilities of the soil and climate for productions of different kinds, and am of opinion that it is perfectly well adapted to the raising of the following articles: Wheat, barley, rye, oats, maize, buckwheat, peas, beans, flax, potatoes, sweet potatoes, turnips, beets, parsnips, carrots, onions, clover, hemp, tobacco, mustard, indigo, grapes, apples, peaches, pears, plums, pomegranates, apricots, melons, pumpkins, squashes, cucumbers, *tunas*, dates, and figs. Most of these already grow and flourish wherever attended to, but I am not aware of the supply being plentiful.

Article six of your circular, desires my "views as to the presence, cause and remedy of any disease or other mischief preventing a full return and increase of crops."

My view of the matter is simply, that there is no existing disease but laziness, and no mischief but indolence to prevent a full return and increase of crops in this part of the country, and no better remedy occurs to me for these afflictions, than a little wholesome industry.

INTERNAL IMPROVEMENTS.

One of the greatest obstacles to the growth and prosperity of the County of San Diego, is the want of adequate communication with the interior. The great body of habitable land is among the hills of the Cordilleras, accessible only by steep and rugged natural roads, which, in consequence of the impassable nature of the valleys and narrow cañons, are carried frequently over high spurs of the mountains, termed *cuestas*, to descend again after the obstacle is turned. The main coast road, about ten miles north of San Diego, has been improved by the construction of an entire new road-bed through a narrow cañon, where it formerly ran over a steep hill at an angle of not more than thirty degrees from the perpendicular. Though the new portion of the road is not more than two miles in extent, it has saved ten times its cost in wear of vehicles and horseflesh. The grade by the new road is now reduced to about one in sixteen.

The road to San Bernardino, by way of Temecula, which ascends a steep hill after leaving the valley of San Luis Rey, has been proposed to be straightened and reduced in grade, which would bring a vast amount of trade and travel to the Port of San Diego, now diverted to Los Angeles by reason of this obstacle. Subscriptions were made, both in San Bernardino and San Diego, to forward the undertaking, but, like many other projected improvements of less importance, the matter remains in abeyance.

The construction of a wharf at New San Diego in 1850, and the commencement by Government, in 1853, of the dam for turning the course of San Diego River into False Bay, north of the true bay, are the only works upon which any great amount of capital has, as yet, been expended.

Under the head of "Internal Improvements" properly belongs the proposed railroad to the Colorado, and to the Mississippi River, by the southern route.

THE SAN DIEGO AND GILA RAILROAD.

Is intended to connect the Port of San Diego with the mouth of the Gila River, forming the California link in the great chain of the Pacific Railroad from the eastern to the western coast of America.

In the latter part of 1854 a railroad company was organized in San Diego, under the title of the "San Diego and Gila Southern Pacific and Atlantic Railroad Company," with a capital of \$5,000,000; the corporation being formed in accordance with the general railroad law passed at the previous session of the Legislature. An assessment of one per cent. was immediately laid upon the subscriptions already made to the stock, amounting to over \$200,000, and the preliminary surveys commenced soon after. The first survey was intended to demonstrate the fact that a practicable pass for railroad purposes existed in the Cordilleras range of mountains, between San Diego and the desert. Accordingly it began at the foothills of the western slope of the range, and was continued through the valleys and cañons leading to the lowest known summits of these

mountains; thence through a system of similar passes to the foothills of the eastern slope, where it connected with the United States Railroad Survey of Lieutenants Parke and Williamson.

The fact being established, that a feasible route existed, though involving somewhat higher grades than would have been deemed expedient in the early days of railroad enterprises, a further survey was resolved upon to connect the base of the mountains on the west with tide water. This survey has also been completed within a few weeks; and the results of the continuous survey throughout the whole route has been presented to the company.

From the Bay of San Diego for the first thirty miles, the line is located along the narrow valley of the San Diego River, its course being nearly north-east to the mouth of Oakwood Cañon, a gulch tributary to that stream; thence running nearly north through that cañon, passing over the valley of San Isabel, its summit, and the valley of San José, to Warner's Ranch, a distance of about thirty miles. Here the course of the route is deflected to the east and south, and for the next thirty miles descends from the summit at Warner's to the borders of the Colorado Desert, the head of Carriso Creek at Vallecito.

From this point the line follows very nearly the course of the wagon road to the mouth of the Gila, at Fort Yuma.

The following is a table exhibiting some of the elevations on this route, with the average grades of the line actually measured and leveled, together with the deduced grades of the best observed location for the road-bed, which it will be necessary to carry well up the side hills of the different valleys, in order more nearly to equalize the grades of the different portions of the line as well as to balance the excavations and embankments:

TABLE OF GRADES

Of the Proposed Route for a Railroad from San Diego to the Gila River.

STATIONS.	Intermediate Distances.	Total Distances.	Average grade, per mile, between level Stations.		Altitude in feet.		Deducted grade of best observed location.	LOCALITIES.
			Ascending.	Descending	Above previous Station.	Above mean High Water.		
Bay of San Diego -	7.048	7.048	9.14		64.46	64.46	9.14	Valley of San Diego Riv.
San Diego Mission.....	2.658	9.706	13.74		36.53	100.99	13.74	"
Entrance to Cajon Gap.....	2.760	12.466	65.84		181.73	282.72	65.84	"
" Valley.....	7.305	19.771	17.75		129.67	412.39	17.75	"
Cajon Rancho, (Santa Monica).....	5.160	24.931	23.68		122.23	534.62	61.4	"
Foot of Miner's Hill.....	7.348	32.279	26.27		193.04	727.66	61.4	"
Capitan Grande, (Indian Village).....	3.610	35.889	39.00		140.79	868.45	107.5	Oakwood Cañon.
Pinery Brook.....	0.850	36.139	66.64		56.65	925.10	107.5	"
San Isabel Trail.....	0.661	37.400	53.22		35.13	960.23	107.5	"
" Base of Devil's Knob.....	1.32	38.72	96.09		126.85	1,087.08	107.5	"
" Angel's Peak.....	3.60	42.32	171.61		617.78	1,704.86	107.5	"
Turtle Falls.....	1.13	43.45	181.32		204.90	1,909.76	107.5	"
San Isabel Falls.....	1.70	45.15	254.46		432.59	2,342.35	107.5	"
" Gulch.....	1.42	46.57	452.71		642.85	2,985.20	107.5	San Isabel.
" Valley (entrance).....	2.27	48.84		12.32	- 27.98	2,957.22	64.72	"
" Rancho.....	2.33	51.17		175.00	402.94	3,360.16	100.00	Warner's Ranch.
Summit of San Isabel.....	3.44	54.61			- 591.97	3,022.12	- 92.00	"
San José Valley.....	4.35	58.96	58.37		253.93	3,629.56	26.21	"
Warner's Rancho.....	4.92	63.88	123.46		607.44	3,629.56	- 102.00	"
" Pass.....	1.90	65.78		263.73	- 501.09	3,128.47	- 106.00	San Felipe Valley.
Oak Grove.....	6.84	72.62		90.45	- 618.79	2,509.68	- 106.00	"
Outlet of Volcan.....	2.08	74.70		73.25	- 152.38	2,455.30	- 106.00	"
San Felipe, (Indian Valley).....	5.59	80.29	36.80		205.75	2,563.05	36.80	"
Head of San Felipe Valley.....	2.46	82.75	30.53		75.11	2,638.16	- 30.50	The "Vallecitos."
Entrance of Cañon.....	1.42	84.17		189.16	- 268.62	2,369.54	- 100.00	"
" Mouth of.....	3.31	87.48		96.51	- 319.46	2,050.08	- 100.00	"
Rincon, (Indian Village).....	1.04	88.52		195.28	- 203.10	1,846.98	- 100.00	"
Mouth of Puerta Cañon.....	3.98	92.50		51.31	- 204.23	1,642.75	- 100.00	"
Vallecito, (Indian Village).....	18.00	110.50		66.54	- 1197.75	445.00	- 66.00	Valley leading to Desert.
Carriso Creek, (watering place).....	15.00	125.50		8.86	- 133.00	312.00	- 8.80	Colorado Desert.
Near Sackett's Wells.....								

TABLE OF GRADES

Of the Proposed Route for a Railroad from San Diego to the Gila River (cont.)

STATIONS.	Intermediate Distances.	Total Distances.	Average grade, per mile, between level Stations.		Altitude in feet.		Deducted grade of best observed location.	LOCALITIES.
			Ascending.	Descending	Above previous Station.	Above mean High Water.		
Great Lagoon.....	9.00	134.50		42.44	- 382.00	- 70.00	- 12.80	Colorado Desert.
Near Little Lagoon.....	11.00	145.50	11.45		126.00	56.00	12.80	"
Alamo Mocho.....	14.00	159.50	8.57		120.00	176.00	8.50	"
Cook's Wells.....	20.00	179.50	1.70		34.00	210.00	1.70	"
Pilot Knob.....	14.00	193.50	2.09		30.00	240.00	2.09	Colorado River.
Mouth of Gila River.....	7.00	200.50	8.57		60.00	180.00	8.50	"

The column of "best observed location" is deduced from a careful examination of the side slopes of the valleys through which the line was surveyed; the surveys of the cross sections of these valleys in general demonstrating that no enhancement of the cost of construction would ensue from placing the road-bed at a considerable elevation above the actual trail of the surveying party. Indeed, the safety of the superstructure would compel such a location, the district being subject to heavy freshets during the rainy season; and the beds of the different streams traversed by the line of survey indicate the occurrence of immense floods, whose volume has been so great as to leave accumulations of driftwood in the topmost branches of high trees on their banks. The additional expense of the few bridges, or embankments, that may be required in passing the mouths of gulches and cañons intersected by this location, will probably offset the cost of protecting a lower track from the consequences of these torrents. From the head of Carriso Creek, at Vallecito, to Fort Yuma, the heights are taken from the tabled reports of Lieutenants Parke and Williamson; and in one or two instances the notes of Major Emory have been used. In cases where the authorities differ, I have selected the result which is more nearly in accordance with my own knowledge of the ground. The distances, which will be often found to vary from the other reports, are in all cases derived from actual measurement with the chain, made by myself while engaged in the survey of the United States public lands, during the years 1854 and 1855.

The character of that portion of the desert just referred to, and the part over which the line passes, whose grades are given below, is now accurately known, and I am enabled to state, from frequent examination of the ground, that *three-fourths of the entire distance is already graded and prepared by nature* for the reception of the rails.

W. P. Blake, Esq., Geologist, of United States Railroad Survey, remarks in his report, "instead of the whole plain being composed of loose and sandy materials, as has been supposed, its basis is a compact blue clay, so hard that the passing of mules and wagons scarcely leave tracks upon it.

Lieutenant Williams says: "It is sufficient for me to say, that the desert may be considered the least difficult part of a railway route to California." The surface is not truly level, but composed of long swells of land, or slightly inclined planes, whose slopes are extremely gradual, as may be seen from the appended table:

TABLE OF GRADES

Of the Proposed Route for the San Diego and Gila Railroad, from the foot of Warner's Pass, to the mouth of the Gila.

STATIONS.	Distance in miles.		Grade, per mile, between Stations.		Altitude in feet.		Grade of best observed Locations.		LOCALITIES.
	Intermediate	Total from San Diego.	Ascending	Descending.	Above previous Station.	Above mean High Tide.	Ascending.	Descending.	
	San Felipe, (Indian Village)..... " Cañon, (entrance).....	2.25	74.70	33.48	33.48	- 98.00	2,455.30		
Rocky Point.....	1.54	78.49		136.80	- 210.70	2,146.60		103.00	Valley lead'g to Desert.
Mouth of Cañon.....	1.13	79.62		200.52	- 226.60	1,920.00		103.00	"
Gorge of the Valley.....	7.40	87.10		60.00	- 444.00	1,476.00		80.00	"
Base of Mountain, (Desert).....	12.20	99.30		65.32	- 796.00	680.00		65.30	Colorado Desert.
Wide Arroya, (Carriso Creek).....	10.80	110.10		60.00	- 630.00	50.00		60.00	"
Arroya of New River.....	20.00	130.10		7.50	- 150.00	- 100.00		7.50	"
Seven Miles N. of Cook's Wells.....	41.00	171.10	1.46		600.00	500.00	1.46		"
Mouth of Gila.....	18.00	189.10	13.66		- 320.00	180.00		17.70	"

The route from the foot of Warner's Pass, at San Felipe, to Fort Yuma, by way of San Felipe Cañon, and a nameless valley leading to the desert, is believed to present facilities for construction superior to that followed by the present wagon road. The preceding table of grades of this line, is formed in part from the railroad survey, and the remainder from my survey of the public lands in that section, verified by the results given in the published report of Lieutenants Parke and Williamson.

By this line some ten miles of distance are saved, and the grades are capable of being made more favorable, as well as more nearly to conform to the natural surface of the ground. Fewer obstacles, in the form of sand hills, are encountered in this improved location; and the supply of water is certainly as reliable as on the other line. It is true that for the first six or eight miles after leaving the valley of San Felipe the cost of building the road must be greatly beyond the average; but after that no obstacle presents itself throughout the entire distance to the mouth of the Gila. It is evident that some considerable amount of bridging, or filling, in order to pass the two or three arroyas, but out of the hard clay of the desert by the rains of the wet season, will be incurred in this more direct location, but the cost will be offset by the sum required to keep a track clear of the drifting sand which will be encountered on the more southern line. An important consideration is the fact, that this line will be built wholly within the territory of the United States, though very near, and for some distance parallel, to the Mexican boundary; while the line proposed adjacent to the wagon road, will pass into Mexico fifty miles before reaching the Colorado River, and continue on foreign soil for about that distance before returning to our own territory.

FACILITIES FOR MANUFACTURING.

On the summits and slopes of the mountains near San Isabel, an extensive growth of lofty pine and heavy oak timber, occupies thousands of acres. This timber is readily available for every needful purpose, and can be easily transported to the tide water. The pine is of the peculiar California variety; rather coarse in texture, but affording lumber in pieces of great length, generally free from knots, and not difficult to work. The oak is not so well adapted for use, being gnarled and knotty. No small quantity of sycamore is found in most of the valleys, which is used chiefly for firewood. No redwood, it is believed, exists in this part of the country. Saw mills have never been erected in this neighborhood, notwithstanding the high price of imported building material, the abundance of standing timber and the number of mountain streams adapted to milling purposes. The creek of San Isabel rises in the region called the Pinery, and for several miles down its course, presents valuable sites for water power, which is available throughout the year, the volume of water being nearly the same in summer as in winter. Within a year a flouring mill has been established in the vicinity of the town, employing two run of stone, at present; and from the fact of being dependent upon the wind for motive power, its performances are entirely inadequate to the wants of the community. The material most general in use for building, is the sun-dried brick called *adobe*, of which nearly every dwelling in the county is composed. Two of our enterprising citizens have commenced the manufacture of brick in the Mission Valley adjoining the town, and a large kiln has just been set up and burned. The machinery is new and patented, and the manufactured article of superior quality. In connection it is

purposed to manufacture tiles and pottery, for which the clay of the district is well adapted.

SUPPLY OF WATER.

Irrigation could, without doubt, be successfully restored to our dry climate; and in the days when the Missions were flourishing, its importance was acknowledged by the worthy Padres who held them in charge. Remains of the old aqueducts used in watering the fields and gardens belonging to them, are seen in various stages of decay. At the Mission of San Diego is a brick canal of several miles in length, formerly used to bring the water employed in irrigation from an artificial reservoir constructed in a valley above the Mission. By the aid of a few repairs this canal might again be made available, and the sun-burnt fields of the Mission Valley once more smile in verdure throughout the year.

Reservoirs, on a similar plan, in all our valleys, would afford a continual supply of water, both the irrigation of ordinary consumption. Every river on the coast is dry during some part of the year; and the inhabitants in the vicinity of them dig temporary wells in the sandy beds, during the dry season, for domestic supply.

An undertaking to furnish the town of New San Diego with water from an artesian well, in the year 1850, failed only for want of means to carry it through. A depth of two hundred feet was reached before operations were suspended; and no obstacles of a serious nature were encountered in the progress of the work. Another well of the same class was commenced at the village known as the Playa, or Beach, on the shore of the bay, but from some similar cause, the interest in the enterprise subsided, and finally dried up, and it was abandoned, after having penetrated the earth a distance of about five hundred feet.

NAVIGATION OF THE COLORADO.

From the Gulf of California to the mouth of the Gila, the Colorado is readily navigable to vessels of two feet draft, at lowest stages of water; and two steamers are in constant transit to and from Fort Yuma, at its mouth, engaged in carrying Government supplies for the use of troops which garrison that important post. The current is very swift and strong, requiring unusual motive power to propel the boats against it. A question of exceeding interest, as to whether the Upper Colorado, which bounds so large a portion of our State, is, or is not, navigable to steamers of any possible construction, has oftentimes been the subject of considerable discussion. Some enterprising frontiersmen have penetrated that upper wilderness, and have come floating down to the settlements on a raft, or in a rude *piroque*; relating tales of wonderful adventures with Indians, beavers and bears, inhabiting the fertile valley of this turbulent stream.

The great cañon, variously stated to be from one hundred and fifty to three hundred miles up the river, is probably the limit of successful navigation with freight-carrying craft. Beyond this, which is doubtless out of the bounds of the State, the river is described to be deep and rapid, and navigable for small craft.

From my survey conducted the past season, up the river for thirty miles beyond the mouth of the Gila, I am inclined to believe that no difficulty would be found up to that

point; and for the many miles that the eye could reach still further up, nothing like an obstacle was discerned.

The Colorado Valley is not very wide on the California side, except where the shifting of the channel had made an abrupt bend in its course; but the business of transportation to and from the valuable lands for settlement, on the other side of the river and north of that place, would accrue, of course, to the citizens of our State, whose interests are at the mouth of the River Gila.

A ferry company at Fort Yuma is doing an excellent business in the transport of travelers and stock across the river, on the emigrant trail from Texas. The highway to Sonora and Chihuahua, also crosses at this point; and no small amount of goods and animals are passing daily to those and other provinces of Mexico. It is apparent that this branch of trade is yearly increasing, though the roads on either side of the Colorado are over deserts of two and three hundred miles each in extent.

MINING AND MINERALS.

Early in the present year the discovery was made that gold existed in the hills near the Rancho of Santa Maria, not far from San Pasqual, and about thirty miles north-east from San Diego. Upon this announcement a considerable number of persons repaired to the spot, with the necessary tools and supplies, set up their camps in the gulches, and fell to digging with great industry. Reports of greater or less good fortune was heard from the miners from time to time, during a space of several months; but the only outward and visible sign of success apparent to our citizens, was the receipt of a few minute particles of dust in payment for goods; in no instance, I believe, exceeding in amount the sum of ten dollars. As a matter of course, the energy of the diggers abated in proportion to their want of success; and so no enterprise can be conducted without the sinews of war, a stoppage of supplies ensued, and the diggings were abandoned in disgust. No subsequent attempt has been made to work the mines, which are of the placer description; nor can operations ever be resumed successfully until the wages of labor are so reduced as to allow of the employment of capital and skill with advantage. Specimens of silver ore have been brought in from the vicinity of Cuyamac Mountain; but no efforts to examine and work the locality has as yet been made.

Reports of the discovery of zinc, copper and coal, have frequently been heard of in the vicinity, but the energies of our people being directed to other and more remunerative objects, such rumors have not been accustomed to be regarded with much interest. Upon the desert, at a point east of Agua Caliente, there is a large salt lagoon, or lake, from whose borders the Indians have been in the habit of supplying themselves with salt. In conducting surveys upon the desert last year, I discovered several springs of intensely salt water, around which were saline incrustations of considerable thickness, affording salt of excellent quality.

About half way across the desert, due east from San Felipe, is a group of springs containing carbonated soda water, which boils up from below, and is kept in constant effervescence by the escape of large quantities of gas. These springs were found and visited by my surveying party about a year ago, and their water used freely by both men and animals. I consider it very agreeable in taste, and the discovery a valuable one in the event of a new route across to the Colorado being established. [These springs are

noticed at length in the report of W. P. Blake, Esq., Geologist, United States Railroad Survey.]

The hot springs in Agua Caliente, a district in the mountains near the desert possess highly medicinal properties, and are much resorted to by invalids and others, for bathing purposes. It is claimed by the resident Indians that their virtues are so potent as to control almost every disease which flesh is heir, and to prolong life itself almost indefinitely. Great benefit is undoubtedly to be derived from their use, and the increasing number of yearly visitors to the locality indicates that our copper-hued brethren are not without proselytes to their hygienic faith.

Both hot and cold water issue from the surface within a few feet of each other, and the required temperature is readily obtained by combining the two streams in proper proportions. No analysis of the water has been made to my knowledge, but it has a highly sulphurous odor, and appears charged with considerable quantities of sulphuretted hydrogen gas, which is evolved in minute bubbles, keeping the surface in continual agitation. Its ordinary temperature is not far from 120° Fahrenheit.

NEW WAGON ROAD TO THE COLORADO.

The subject of a shorter road to the mouth of the Gila has attracted considerable attention of late, and various routes have been proposed, tending to reduce the distance from two hundred and twenty-six to one hundred and fifty miles, or thereabouts. By the judicious expenditure of ten to twenty thousand dollars, an immigrant road could be constructed from this place to the edge of the desert at Carriso Creek, over a district abounding in water and grass of the best quality. On the old line of road there is no good grass or water beyond Warner's, leaving one hundred and fifty miles to be traveled with an indifferent supply of both these necessaries. By the new line, as soon as the plain of the desert is passed, the traveler enters upon a fruitful and well-watered region. This road would turn from the main one at Carriso Creek, running nearly west to the rancho of William Williams; thence over rolling and table lands to the San Diego, or Sweetwater River Valley, and following either to the bay.

The aid of the State has been solicited for this project, but the matter has been postponed by the Legislature from time to time; and meanwhile the immigration is retarded by the hardships of the road, and the State is a sufferer for want of population. A renewed effort is to be made at the approaching session; and for the sake of the public welfare, it is to be hoped the assembled wisdom will see that its interest demands the immediate construction of the road. A good reason can hardly be offered why the immigrants by the southern route should not be furnished with the same facilities for reaching California that are enjoyed by those coming in at a point more northerly.

SURVEY OF COUNTY LINES.

The northern line of this county is the only one that requires to be surveyed and marked, for the purpose of mapping, as it is chiefly on the lines of ranchos, which are known to be irregular, and sometimes uncertain. It is doubtful whether this boundary could be changed so as to satisfy the proprietors in that part of the county, and it is not certain that a township line, or standard parallel of the U. S. survey would render the boundary more distinct or less liable to the disturbance, or destruction of its monuments.

A survey as far as the summit of the mountains bounding the agricultural district, is all that seems to be required at present, as the line is continued beyond that point, at a given course, which is that of the south boundary of the State.

STATE MAP.

I have no hesitation in saying that the map of the State of California, approved and declared to be official by Act of Legislature, whatever may be its reputation for accuracy in the northern counties, is most lame and impotent in its delineations of the topography of this part of the State. Places are given upon the map that are new to our oldest residents, and fabulous localities are bestowed upon us gratis, and furnished "officially" with a local habitation and a name. Roads are laid down thereupon, over districts which have never been, and in all human probability never will be, trod by mortal man, and old and well-known points are either stricken out of existence, or baptized with new and unheard of appellations. The number of rivers in the county is not far from correct, but their locations and courses do violence to all notions of topographical propriety. The faint shadowing of mountains over some portions of the district, hardly gives us a complete idea of their extensive proportions, nor does the vast and important region known as the desert, seem to have been considered worthy of even a name. The road to Fort Yuma is very conveniently located on the map, being a great improvement over the one upon the ground, and the numerous wells placed adjacent thereto by our ingenious geographers, must afford a grateful solace to the thankful and thirsty traveler, should he ever succeed in finding them.

Plainly and seriously, this map as far as it relates to this section of the State, is a sham and an imposture, altogether as disgraceful to the authority which indorsed it, as to its makers or compilers. A crude and ill-digested performance like this, conducted with parsimony and executed in haste, cannot fail to bring reproach upon the profession, as it has already wronged the public who authorized its publication.

A map worthy of California, and entitled to respect as competent authority, never could have been constructed in the short space of time allotted to the one under consideration, even with a large and able corps of surveyors, observers and assistants, and liberal financial aid from the State – none of which advantages I suppose that enterprise to have enjoyed.

No reliable map of the State can be produced, I think, unless liberal appropriations are made to carry on the undertaking, in order that the services of skillful and experienced practitioners can be secured for a term of years, the longer the better, so as to determine with the utmost accuracy, by astronomical and trigonometrical measurement, the exact position of every important point. The only system by which this can be accomplished, is that of covering the entire area with a net-work of triangles, and this we know is a work of patient and extended labor, and by no means a matter of speedy accomplishment.

Those States and foreign countries which have hitherto engaged in such surveys, have acted in accordance with similar views, and few of their surveys are yet completed, their publications being generally confined to detached and important localities. The "ordinance survey" of England and Ireland is still in active prosecution, and although it has been forty years in progress, it is not yet complete as a whole. The survey of France, commenced some sixty years since, has not been published, nor is

our national coast survey much more than commenced, though it has been conducted with energy and expedition, with every assistance the Government could furnish, for twenty-three years. The State surveys of New York, Massachusetts, and several other States, were from eight to fifteen years in progress, under exceedingly liberal auspices, before any results were published, and these were even declared unsatisfactory by their compilers, owing to the brief time allowed for their completion.

With the plain history of similar undertakings before us, and the light of their experience as a guide, it would be unwise for us to expect the production of a correct and finished map, before time and means had been provided to perfect a thorough and minute survey. The publication of a worthless, because inaccurate map, works harm in more ways than one, and not the least is the discredit it throws upon a profession claiming some hard-working and deserving members.

Private enterprise can furnish all crude and cheap maps that are wanted for ornament and show, and are demanded by those for whom such things are sufficient, but an enlightened community, and an age of intelligence requires a high degree of perfection in a public work like this, susceptible in all its details, of the most rigid demonstrative accuracy.

I have the honor to be with high respect,
Your most obedient servant,

CHARLES H. POOLE,
Surveyor San Diego County.

COUNTY SURVEYOR'S OFFICE,
San Francisco, November 1, 1855.

Hon S. H. MARLETTE, Surveyor-General:

Sir:

In compliance with your instructions, I beg leave to submit the following report:

SWAMP AND OVERFLOWED LANDS.

There are about 11,000 acres of swamp and overflowed lands in this county, the whole of which are covered by Mexican grants, and is in my opinion not reclaimable at any reasonable expense.

I have not located any claims upon these lands since the Act of the last Legislature in regard to their disposal.

COUNTY BOUNDARIES.

The boundary line between this county and Santa Cruz, for about ten miles, should be officially run as soon as possible. The number of acres embraced within the

limits of this county is about 207,000, the greater proportion of which is mountain land, and unfit for cultivation, being only of use as pasture land.

The number of cattle, swine, horses, etc., is too fluctuating for an opinion.

Any attempt to compute the agricultural products of the county would be impossible for me, but I presume the necessary information could be had from the Assessor, who I suppose will embrace that in his report.

I have just finished a topographical map of this county, showing all the county roads, streams, rancho lines, etc., in fact everything of importance within the county. It is not yet lithographed, but when it is I will file a copy in your office.

The State Map, as regards this county, is drawn upon such a small scale that no idea of its accuracy can be formed.

Very respectfully,
Your obedient servant,

J. J. GARDINER,
Surveyor San Francisco County.

COUNTY SURVEYOR'S OFFICE,
San Joaquin Co., Dec. 10, 1855.

To S. H. MARLETTE, Esq., Surveyor-General:

Sir:

In accordance with your request, I send you a report of my labors and observations since I have been occupying the position of County Surveyor, but as that time has been limited to two months, you will, of course, expect from me but a very meager report.

Since I came into this office I have been the most of the time engaged in surveying tracts of swamp and overflowed land. The greater portion of the lands I have surveyed can, and no doubt will, be reclaimed, as also as many thousands of acres more for which application has been made, but which I have, as yet, been unable to survey. From October 1 to December 1, I have made sixty-three surveys of swamp land, which include an area of 13,931 acres, copies for the greater portion having been forwarded to your office. Of the remaining portion I have not, as yet, had an opportunity to obtain the necessary evidence of their being swamp land. In addition to those surveys already made, I have now on file in my office affidavits which will include as much land as that already surveyed. I am of the opinion that all of the swamp land in our county, which is at all available, will be purchased within the coming year. We have many thousand acres of tule land that must lie as there are for many years to come. I am well satisfied the time is coming when these lands will be sought for as being the most valuable tillage land in the State. Experiments in this vicinity have fully

demonstrated the fact, that tule land, when reclaimed, is admirably adapted to gardening purposes; but at present the cost of reclaiming the land would be so great as to deter any person from making the attempt upon an extensive plan; it may, and will, no doubt, be done, before many years, by combination of individuals. And in this connection I wish to say, that I think some plan different from the present one must be adopted, in order to survey the tracts of tule land which may be called for. Applications have frequently been made to survey tracts of tule land upon the San Joaquin River and Stockton Slough; at a distance, in some cases, of ten or twelve miles from any township line of the United States survey, and where it is altogether impracticable to extend the township, or sectional lines, from the plain, as it is almost one solid mass of tule, with frequent deep ponds and sloughs.

Two methods for surveying these lands have suggested themselves to my mind, which I will mention: The first, is to erect monuments upon Mount Diablo meridian, and at other convenient points having a measured base; and from, and by, these monuments, the position of the different tracts might be obtained by triangulation. The second method is, to make a correct survey of the San Joaquin River and Stockton Slough, in connection with the United States survey; and in making such a survey to establish permanent posts, or monuments, of some kind, fixing the position of each post upon the township plats, and by that means the position of each tract of land could easily be defined. I question whether the quantity of those lands now required would warrant the expenditure that would be incurred by either of these plans, but I can think of none more feasible; and, as the State has said, "the land must be surveyed," some plan must be adopted by which such surveys can be made, I submit these methods to your opinion of their feasibility; but in any event I am of the opinion that the State should make a survey of the San Joaquin River, under the direction of the Surveyor-General. I am at present altogether unable to make the surveys under instructions. There is one subject to which I have frequently called the attention of the Court of Sessions, and more recently the Board of Supervisors, and which has so far been neglected. I refer to the south-westerly boundary of this county. The line, at present, is an imaginary one, and its position upon the ground is a point upon which there is a great difference of opinion, and I think the line should be run, and proper monuments set up. It is now, however, too late to run the line this winter, as a party might be encamped for a week and not be able to obtain the variation of the needle on account of cloudy weather.

Of our county roads and bridges, I really wish to say nothing, for they are in such a condition as to speak for themselves, particularly to a person traveling over them now that the rain has come. So far as my own experience is, the county has never built a rod of road, or a single bridge, culvert or causeway; nor do I think there is a present prospect that they intend doing so. It is really shameful that in a county where good roads are so much required, that so little attention should be given them. Private individuals have built some bridges and made some repairs upon the roads, but I am not aware that the county has ever been guilty of doing anything of the kind.

I think the Act of the last session of the Legislature, creating a highway tax, was a good Act; and I am now in hopes that another year will see some roads properly built.

Sometime last year an artesian well was commenced in this city, and bored to the depth of four hundred feet. It was supposed that water could be obtained within that distance, and therefore the contract for the work called for but four hundred

feet, so that when the contract was fulfilled the work ceased. The work was done at the expense of the county and city. At present there is no prospect of the work being carried on. If water could be obtained within any reasonable distance by the boring of artesian wells, they would be of inestimable advantage to this county, as there is now many thousand acres of land lying waste which would be valuable if water could be obtained for irrigation.

I was much pleased with many suggestions, or recommendations, made by you in your report at the last session of the Legislature, one of which I believe was, "that none but Civil Engineers should be eligible to fill the offices of County Surveyors, and that sufficient inducement be offered competent men to take the office." And in this connection I wish to say, that my opinion is, that the County Surveyor, if he can give evidence of his ability, should have the general direction and supervision of the building and repairing of all roads, bridges, etc., upon all of the public highways in his county; as it is fair to presume that if he is a competent engineer he is better capable of building good roads than any person who has never made such things a matter of business or study; and I am of the opinion that my public work is better managed by one head, if that head is good one, than by a dozen. In such event, the salary, or per diem, and traveling expenses, while attending to such duties, should be sufficiently liberal to induce him to attend to the matter personally and promptly, otherwise any enactment would be a dead letter. If the per diem should be left in the hands of the Board of Supervisors, it would in most cases be so low that no County Surveyor, who was really competent to discharge the duties, would give the matter any attention. So far as our county is concerned, good public highways are of the greatest importance, and yet it is a matter that seems to be almost entirely lost sight of.

The separation of the swamp and overflowed land from the high land, is another matter of importance which should be attended to, but I have already extended my remarks, perhaps, too far.

The general statistics of this county I am unable to give you, never having given the subject any attention, and must therefore refer you to the report of our County Assessor.

Respectfully, your ob't serv't,

GEO. E. DREW,
County Surveyor, San Joaquin County.

COUNTY SURVEYOR'S OFFICE,
San José, Dec. 4, 1855.

Hon S. H. MARLETTE, Surveyor-General:

Sir:

Owing to an unexpected pressure of professional business, which could not be delayed, the time has been consumed which I intended to expend in gathering statistics, in accordance with the instruction of your circular. Hence the late date of this report.

SCHOOL LAND WARRANTS.

No School Land Warrants have been located in Santa Clara County since the 23rd of September, 1854. Several warrants, located in other counties, and not canceled, have afterwards been brought to this county for location, thereby causing much trouble. By a reference to your report for 1854, I see that similar frauds have been practiced, to a great extent. That this matter should be attended to without delay, is obvious.

SWAMP AND OVERFLOWED LANDS.

No application has been made, to this office, for a survey of any portion of the swamp and overflowed lands in this county. It is not probable that there will be any purchasers for such lands until a portion, at least, of the land held under private grants, and now in the market for sale at a low price, is disposed of. With the aid of the U. S. Township plats, together with field notes in this office, I could furnish a pretty accurate map of the swamp and overflowed lands in this county.

It would be impossible, without the aid of a map, to add to the topographical information concerning this county, now in your office, and contained in the report of my predecessor, dated Dec. 15th, 1852.

COUNTY MAP.

During the past summer, I furnished the Board of Supervisors with a map of Santa Clara County, compiled from map and field notes of County Surveys on file in this office, together with other material in my possession. Such a map would, of course, give but an imperfect idea of the geography of the county; still it might be of use in making a map of the State. I shall endeavor to transmit a copy of it to your department during the winter. The necessary surveys for a complete topographical map, showing the boundary lines of the county, would cost several thousands of dollars.

MAP AND FIELD NOTES OF COUNTY LINE.

I have learned from private sources, that portions of the boundary line of Santa Clara County have been surveyed by the State, but up to this date, no map or field notes of such survey have, to my knowledge, reached this office. I have been lately informed, however, by Mr. Wright, the gentleman who surveyed the line between this and Santa Cruz County, that a copy of the map and field notes of the line will be forwarded to me in the course of a few weeks.

COUNTY BOUNDARY.

It is quite important that about thirty miles of the north-eastern boundary of this county should be run during the ensuing year, as large settlements are rapidly springing up in that vicinity. The probable expense would be about thirty dollars per mile.

GRAIN.

The principal agricultural products of this county, I estimate as follows:

	Acres.	Bushels.
Wheat.....	20,000	300,000
Barley.....	3,000	90,000
Oats.....	1,500	60,000
Rye.....	75	1,875
Corn.....	300	6,000
Buckwheat.....	20	400
	<hr/>	<hr/>
Totals.....	24,895	458,275

Garden vegetables, of almost every description, have been successfully cultivated and raised; in what quantities I have not ascertained.

FRUIT TREES, ETC.

Orchards have been set out, and vineyards planted, in every part of the county. I estimate the number of fruit trees as follows:

Peach.....	35,000
Apple.....	30,000
Pear.....	15,000
Cherry, Plum, Quince, Apricot and Fig.....	<hr/> 5,000
Total number of all kinds.....	85,000

This does not include the vast number of trees of the choicest varieties, contained in the numerous nurseries in the vicinity of the City of San José.

Grape vines are generally thrifty and fruitful. One vineyard of 6,000 vines, yielded during the past season, an average of ten pounds of grapes to a vine.

There are about 40,000 grape vines in the county, of which, probably, 20,000 bore fruit during the past season.

CROPS DAMAGED OR DESTROYED.

The wheat crop was badly injured in many parts of the county, by both rust and smut. This, together with the depredations committed by ground squirrels, has reduced the average yield of the valley at least one-half. After an exceedingly dry winter and spring, ground squirrels have become very numerous and troublesome. Like the inhabitants of Sebastopol, having intrenched themselves in the dark recesses of the earth, they defy all the attempts of civilization to dislodge them. Alliances have been formed, however, for their destruction, and what, with cold water and cold lead, artesian

wells and strychnine, fond hopes are entertained of a triumph over these enemies of industry.

ARTESIAN WELLS.

From ninety to one hundred artesian wells have been sunk in the northern portion of the valley within the last two years, many of which discharge upwards of five hundred gallons of water per minute, each.

A well, bored by Messrs. McLenan & Allen, for the purposes of a tannery in the town of Santa Clara, threw a column of water, six inches in diameter, five feet above the top of the pipe – discharging, at first, stones of over two pounds weight. I have gauged the water of the well, and find that it discharges over 1,000 gallons per minute. It is two hundred and nine feet deep, six inches in diameter, and cost \$600.

A well, sunk last spring on the road from San José to Alviso, tow hundred and fifty feet in depth, only one hundred and fifty feet of which was piped, discharged enormous quantities of water, together with sand, gravel and large stones, until the ground for rods around it was undermined and precipitated into the gulf beneath.

Wells discharging equal volumes of water, and situated near each other, often vary greatly in depth. The strata encountered are also ever varying, both in kind and thickness.

In some wells the discharge of water is gradually diminishing; in others it has ceased altogether. This, it has been ascertained, is owing generally to deposits of sand and gravel at the bottom of the well which are easily removed.

There are, however, instances where wells have been materially affected by the construction of others in close proximity.

COLLEGES AND SCHOOLS.

Santa Clara County is justly celebrated for its excellent schools and seminaries. There are two regularly incorporated colleges, both of which have the powers of conferring degrees and academical honors, and of exercising all the rights and privileges of any literary institution in the United States.

“Santa Clara College,” located on the old Mission property, in the town of Santa Clara, was founded in 1851, by the Roman Catholic Church, through the agency of Father John Nobili, (a member of the Society of Jesus,) and was incorporated under and Act passed by the last Legislature. During the past year, a large number of professors have arrived from the Atlantic States and different parts of Europe, and permanently connected themselves with the institution.

Upwards of \$50,000 have been expended on the buildings and grounds. The library numbers over 10,000 volumes.

Number of students in all departments, last session, was one hundred and eleven.

The “University of the Pacific,” located also in the town of Santa Clara, was founded in 1851, by the Methodist Episcopal Church, through the untiring perseverance of the Rev. Isaac Owen, and comprises a male and female department. In the male department, a class has advanced from the primary studies to the middle of the Sophomore year, of college proper. Numbers of students, during last year, was one

hundred and thirty-four. In the female department, classes have advanced from the primary studies to geometry. Number of pupils during last year, was one hundred and nine.

The University is in possession of a good philosophical and chemical apparatus. The buildings and ground of both departments are valued at \$30,000.

The "Young Ladies Academy," situated in the City of San José, founded in 1851, and under the superintendence of the Sisters of Notre-Dame, is celebrated throughout the State as a Seminary of great excellence, and the favorite abode of literature and refinement.

During the last session there were one hundred and thirty pupils who boarded at the establishment.

Attached to the institution, is a free school for girls, with an attendance of fifty-three pupils. The buildings and grounds are valued at \$75,000.

SAW MILLS.

We have eleven saw mills, which produce in the aggregate five millions feet of lumber annually. Average value of lumber at mill, \$17 per thousand.

FLOURING MILLS.

Seven fine grain mills have been erected in the county, driving in the aggregate seventeen run of stones, and capable of manufacturing every description of flour and meal in the best possible manner. Two are steam mills, the balance are run by water power. One mill, with two run of stones, derives all its power from the water of several artesian wells. The probably cost of all the grain mills in the county is about \$470,000. They are capable of producing five hundred barrels of flour per day.

STORES AND SHOPS.

The number of stores and shops, in which goods are sold, is one hundred and seventeen; and the capital investment in mercantile pursuits falls but little short of \$300,000. The amount invested in the manufacture of flour, lumber, bricks, lime, boots, and shoes, soda water, whisky, leather, flour and grain sacks, buggies, wagons, saddles, harnesses, agricultural implements and clothing, is about \$500,000.

ROADS.

Your remarks and suggestions in relation to public roads, contained in your report, dated December 15th, 1854, deserve the serious attention of the Legislature. That California has, as yet, no road system adapted to her wants, must be evident to every one who has investigated the subject. Roads are, or should be, of at least two different classes. Those connecting large cities and towns need to be located with greater care, and with a view to greater permanency, than those merely affording a means of communication between small neighborhoods and hamlets. Although roads leading to distant localities may serve to accommodate small villages, still this should be a secondary consideration. At present, precisely the reverse is the case; and in many

instances where several contiguous boroughs have been connected by short pieces of county road, the whole line, however zigzag it might be in its course, has been adopted as the great thoroughfare between, perhaps, populous and distant towns – which must be patiently meandered by the multitudes who have occasion to pass between the two points. A system of main trunks should be so located throughout the State as to connect important points by the most feasible routes and by lines as direct as the topography of the country will admit of. These should be under the direction of the State, and would afford, not only the means of an easy and rapid transit between important points, but necessarily accommodate in the best possible manner a majority of the villages and settlements throughout the commonwealth. After this, the construction of a few short branches would complete a system of roads at once simple and harmonious.

Yours, very respectfully,

LUCIEN B. HEALY,
Surveyor Santa Clara County.

SANTA CRUZ, Oct. 16, 1855.

Hon. S. H. MARLETTE, Surveyor-General:

Sir:

In answer to your circular letter of June 16th last, I would respectfully submit the following report:

SURVEY OF COUNTY LINE.

In accordance with your instructions I have surveyed and marked the line separating this county from the Counties of San Francisco and Santa Clara, and will furnish to your office as soon as practicable, a map of the line of survey and the accompanying field notes.

COUNTY MAP.

In am now collecting the material for the construction of a county map, and as soon as I can complete it, will likewise transmit you a copy of the same.

I cannot give you the exact area of this county in square miles, as I have not yet procured copies of the township plats, but suppose that the following estimates will be found nearly correct:

Of agricultural land about one hundred and eighty square miles. Of this the greater portion is well adapted to the growing of grains and vegetables, and in sheltered

localities, I think will do well for fruit trees. Of grazing land, mostly mountainous, about one hundred and fifty square miles.

TIMBER.

The remainder, being about two hundred and fifty square miles, is only valuable for its timber and minerals. Much of the timber lies near the coast, is easy to access and of good quality; consisting of pine, fir, red-wood and oak.

MINERAL LANDS, GOLD, QUARTZ, ETC.

I cannot state correctly the extent of mineral lands which this county contains. Gold is known to exist throughout an area of at least twenty square miles. The placer, or surface diggings, as yet have given but a small yield; not more, on an average, than two dollars per day to the hand. One quartz vein has been discovered and partially opened, and is perhaps equal in richness to the best in the State. This vein lies about three miles north-westerly from Santa Cruz; runs nearly north and south, and has a dip of thirty degrees to the west. The length of the vein has not been prospected. The quartz is rotten and easily worked, and the gold very fine and disseminated throughout the rock. How extensive and valuable these veins will prove can only be ascertained by future working and examination, but as the embedding rocks, and all the attending characteristics, are similar to those found in other mining portions of the State, we may reasonably suppose that they will yet become a source of much profit.

Limestone is abundant and of good quality on the slope which faces the bay, and lime has already become one of our leading articles of export.

Good grindstone quarries are found on the line which separates this county from the County of Santa Clara.

The agricultural and other statistics will be furnished to you by the County Assessor, who has had better opportunities for procuring them than I have.

ROAD SYSTEM.

I did not receive a copy of your last Annual Report, and cannot, therefore, offer any suggestions in regard to your proposed Road System.

The Road Laws passed by our Legislature at its last session, I think have the same objections as the Road Laws heretofore in force. The tax of five cents on the one hundred dollars worth of taxable property is altogether insufficient in this county, and the tax of four dollars, which the Board of Supervisors have the power of levying on each person liable to pay road tax, is unjust certainly and unequal in its operation. It will perhaps do for the mining counties, but in this county the advantages are all on the side of the property holders, whose lands are increased in value by their proximity to good roads, while the tax which they pay is but a trifle in comparison to the advantages which they derive. If the latter tax were reduced and the property tax increased to ten instead of five cents, the law would give more general satisfaction at least. I know the objection to this would be, that property is already sufficiently taxed; and so it is, but as the law now stands a Board of Supervisors can tax or not tax at their discretion; or else levy the

individual tax and omit the property tax altogether, as they have done in the county. The consequence is, that up to this time there has been no work done on the roads under the last law.

Very Respectfully,

THOMAS W. WRIGHT,
Surveyor Santa Cruz County.

OFFICE OF COUNTY SURVEYOR,
November 20, 1855.

Hon S. H. MARLETTE, Surveyor-General:

Sir:

Having recently entered on the discharge of the duties of my office, I am unable to make more than a meager report. The only surveys made in this county of a public character, during the past year, are those made by the U. S. Surveyor, in sectionalizing the public lands, therefore I have no data to furnish which will aid in compiling material for a map for the State. The present map of the State I conceive to be incorrect in many respects.

IMPROVEMENT OF SACRAMENTO RIVER.

The Sacramento River is the only navigable stream in this county, and runs nearly through the center, from north to south. It is navigable as far up the Red Bluffs, for light draft bots throughout the entire year, which, however, was not the case until the present year, when the California Stream Navigation Company cleared that portion of it between Red Bluffs and Colusi, of snags, which enabled them to run one of their boats to the former place during the lowest stage of water. That portion of the river between Red Bluffs and the mouth of Clear Creek, a distance of about forty miles, is susceptible of being made navigable at all seasons, by a comparatively small expenditure; the channel being narrower, is deeper than that below; there are but very few snags in it, the greatest obstruction being the rocks in that part of the river known as the Iron Cañon. A small appropriation would be sufficient to render this forty miles of river navigable during the entire year, the benefits of which would be beyond calculation to the citizens of the northern portion of the State. The plan for the improvement of this part of the river which was agitated in the last Legislature, viz: that of granting the exclusive right of navigating it for a series of years, to certain individuals, I conceive to be impolitic, and I think it would be far better for our Legislature to await an appropriation from Congress than to grant such a charter.

ROAD SYSTEM.

The roads of this county are under the supervision of the Board of Supervisors, and are generally in very bad condition, but very little improvement having been made by the present tax. I concur with you in your proposed road system, and am fully satisfied that the present system will never be productive of good roads.

IMMIGRANT ROAD – NOBLE'S PASS.

While on the subject of roads, I would be leave to mention the Immigrant Road across the Sierra Nevada Mountains, known as Noble's Pass. This road comes into the Sacramento valley near Fort Reading. It leaves the Humboldt River near the Great Meadows, and the only desert of any length is easily crossed in one day. The ascent in crossing the mountains is so gradual that the traveler scarcely perceives it, and the grade is equally gradual in the descent. There is no scarcity of grass or water on the entire route, except on the desert already alluded to. I think our next Legislature would do well to give this route some attention, as it is beyond all doubt the most feasible for a stage road or railroad across the plains, of any other that crosses the Sierra Nevada Mountains.

TIMBER.

The timber of this county is oak, cottonwood and sycamore in the valleys, and pine, fir, spruce, cedar and manzanita in the mountains. Good timber can be had only by going to the mountains, from which place all the lumber for building and fencing is procured.

TIMBERED LANDS.

It occurs to me that it would be good policy to have these timbered lands surveyed and brought into market as other lands, in order that those engaged in the lumber trade might make themselves secure from trespassers, for these lands within a few years will not be inferior in value to the agricultural districts.

GOLD.

Gold is found in nearly every portion of the mountain districts of this county.

MINERAL SPRINGS.

There is quite a number of mineral springs in this county, about eight miles north-east of Red Bluffs. Some of these springs are salt, some sulphur, while others are so tintured with various mineral substances that it is very hard to decide which predominates. Several of them emit gas which easily ignites, and burns until put out. The proprietor uses the gas to boil the salt water. The water of one of these springs is said to possess rare medicinal qualities, by several medical gentlemen who have tested its virtues.

DITCHES.

There is quite a number of ditches in this county, for the supplying miners with water. The largest of these is the Clear Creek Company, whose ditch is thirty-three miles in length, and capable of carrying one hundred sluice heads of water. It is nearly completed, and will furnish water for the employ of more than one thousand men.

SWAMP AND OVERFLOWED LANDS.

There is very little land in this county which can properly be denominated swamp or overflowed land. The only lands at all subject to overflows, are those lying along the Sacramento River and its tributaries, and are so detached, and in such small parcels, that I have no means of ascertaining the number of acres.

For the statistics of this county I refer you to the Report of Assessor Hughs, of this county, a summary of which is herewith inclosed.

Respectfully your
obedient servant,

A. H. STOUT,
Surveyor Shasta County.

COUNTY SURVEYOR'S OFFICE,
Yreka, Sept. 22, 1855.

Hon S. H. MARLETTE, Surveyor-General:

Sir:

There are about 100,000 acres of land lying in this county, and there are about 25,000 acres of that which are tule and overflowed, about half of which can be reclaimed; some of it at a reasonable expense. The remainder, 75,000 acres of land, is highly productive.

None of the land ahs been townshipped or surveyed by the United States Surveyors.

THE MINES.

The gold mines in Siskiyou County are paying a reasonable income. The creek and river minus have paid better heretofore than dry or deep digging, but there has been a great deal of investigation made in the mining business, and the gold has proven to be extensive in the deep diggings; and the whole of the miners average about four dollars per day to the hand.

CONCERNING THE FIVE HUNDRED THOUSAND ACRES OF LAND GRANTED TO THIS STATE; ALSO THOSE GRANTED FOR EDUCATIONAL PURPOSES.

There are about 30,000 acres of land in Siskiyou County covered by, or taken up, under the pre-emption law; and about three-fourths of it will be government land when surveyed by the United States Surveyors, and the other fourth will be State lands.

There have been four school land warrants located in this county. No. 661 (160 acres) and No. 658 (160 acres), granted to Daniel S. Roberts; and No. 646 (160 acres), granted to F. H. Woods, were all located by S. Oldham, in Shasta Valley, (granted to D. D. Colten); also No. 219 (320 acres) was located by P. A. Hartstrand, in Scott Valley.

There are no Mexican Grants lying in this county.

CONCERNING THE AGGREGATE QUANTITY OF STOCK AND PRODUCE OF THE STATE IN THE COUNTY.

	No.
Horses.....	1,000
Cattle.....	3,000
Hogs.....	1,500
Mules.....	2,500
Sheep.....	200
	Acres.
Wheat – 60,000 bushels; twenty bushels to the acre.....	3,000
Barley – 24,000 bushels; “ “ “	1,200
Potatoes – 60,000 bushels; one hundred bushels to the acre.....	600
Oats – 37,500 bushels; twenty-five bushels to the acre.....	1,500
Onions.....	200
Corn.....	250
Beans.....	200
Vegetables.....	1,000
Fruit trees.....	500
	<hr/>
Total amount in cultivation.....	7,950
Under fence for grazing purposes.....	20,000

FERRIES, BRIDGES, ETC.

There are five ferries and one toll bridge in this county.

There is one canal about completed eighty miles long, four feet wide in the bottom, 6 feet wide at the top and two feet deep.

This canal is taken from the Shasta River west of the Shasta Butte and leads water on the Yreka and Hawkingsville Mines, and this canal will cost about \$200,000.

There are also many other small canals or ditches in this county to lead water into the mines.

THE MINES.

Are very extensive; in fact, the mining region extends over the larger part of this county. Gold has been found on all the streams in this county. It has been found in abundance in the eastern part of this county; on the Sacramento, Pitt and McCloud

Rivers, in rich and extensive deposits; and then in the northern part of the county on the Klamath, Scott and Shasta Rivers, it has been found to be very rich and extensive.

There are a great many quartz leads in this county that pay from six to fifteen dollars to the tun. Some of them have been worked, but it was at the time when machinery could not be had that was competent to do the work with – (crushing quartz. But the time is near at hand when there can be machinery conveyed into this county to do any kind of work with, and then the quartz mills will be extensive and pay well.

ROAD FROM YREKA TO RED BLUFFS.

There are several public highways or wagon roads in this county, but we have no public highway or wagon road leading from Yreka to the Sacramento Valley or to the Seat of Government; but there is a route which has been reviewed (I have been over the greater part of it myself,) and the part which I have been over is a good and practicable route for a wagon road, and the balance of the route, I have been told by responsible men, is also good and practicable; and the whole length of the road from Yreka City to Red Bluffs on the Sacramento River, is about one hundred and sixty miles. And there is plenty of water and grass the whole extent of the route, with a little exception in one or two places of about sixteen or eighteen miles in length. There have been some wagons and teams which have gone from Red Bluffs to Yreka with heavy loads, and if the road was located and some work done on it, in a short time we would have a good road from Yreka City to Red Bluffs. We have a road leading from Yreka City to Oregon, and if we had a good road leading from Yreka City to Red Bluffs, then there would be a road leading through the whole extent of the State of California and the Territory of Oregon; and it would be a very great advantage to this part of the State if we had a road of said dimension from Yreka City to Red Bluffs.

Respectfully,
Your obedient servant,

E. M. STEVENS,
Surveyor Siskiyou County.

Benicia, Sept. 30, 1855.

Hon S. H. MARLETTE, Surveyor-General:

Sir:

I now proceed to make my final report on the subjects embraced in your circular:

LANDS.

	Acres.
The whole amount within the county boundaries will be equal to about	535,000

Swamp lands, about.....	90,000
Subject to overflow, about.....	35,000
Valley lands, about.....	280,000
Mountain and hill lands, about.....	150,000
Suitable for tillage, about.....	175,000
Suitable for grazing, about.....	280,000
Cultivated this season, about.....	16,500

	Acres.	Yield.
Planted in Wheat.....	7,500	150,000 bush.
“ Barley.....	5,200	156,000 bush.
“ Oats.....	700	28,000 bush.
“ Corn.....	700	21,000 bush.
“ Potatoes.....	200	30,000 bush.
“ Broom Corn.....	125	
“ Onions.....	50	500 tuns.
Mowed for Hay, about.....	4,000	6,000 tuns.
Planted in other crops.....	25	

There are three flouring mills in the county; two are driven by steam, and the other alternately by water and steam.

There have been four artesian wells commenced, but no one has yet been completed. That commenced at Benicia by Pacific Mail Steamship Company, has been sunk about three hundred feet, but the work is now suspended, and has cost upwards of \$6,000. It was begun on the tule in front of the hill, and for the first one hundred feet passed through a blue clay, the other two hundred feet was mostly through hard limestone rock, but had some veins of clay, pebbles and sand.

The one commenced on Mare Island, by the Government, has been sunk about one hundred feet, and obtained an impure, sulphury, water.

The one commenced at Suisun City has been sunk about three hundred and sixty feet, much of the distance through a blue clay, and have obtained some good water in sand and pebbles; it comes within about three feet of the surface; it is still progressing.

The one commenced by A. P. Jackson, Esq., is sunk about one hundred and sixty-five feet, mostly through a stiff clay. The work is now suspended, but to be resumed at an early day.

STOCK.

I estimate the stock as follows:

	Head.
Horses.....	3,000
Cattle.....	24,000
Sheep.....	18,000
Hogs.....	17,000
Goats.....	200

Mules.....	300
Value of animals slaughtered, \$100,000	

On the subject of the county boundary I would say, that something should be done before January 1, 1857, as a number of persons within this county have been assessed in the adjoining county, and thereby subjected to pay tax in both counties.

The Act passed at the last session of the Legislature, defining the boundaries of Napa County, has dismembered a portion of our county and connected it with Napa, without any plausible reason, which our Member of Assembly ought to have prevented. The said Act begins with the Napa line at the mouth of Guichica Creek, and runs due east until it arrives at the mountain separating Suisun from Napa Valley, - which line may circumscribe the globe but will never touch the mountains referred to; thence along the top of said mountain until it intersects the southern boundary of the Chermilles Grant, and as this grant has never been located, this point is very indefinite; thence easterly along the southern boundary of the grant until it arrives at the top of the mountain separating Vacca and Napa Valleys; this line might strike Kamskatka but could never strike the mountain referred to.

As a substitute for the present boundary I would recommend that it begin at the point designated in the original law, the point where the Suscol Creek enters Napa Creek, and running up the said Suscol Creek until it meets the foot of the mountain; thence in a direct line to the corner of townships five and six, north of ranges two and three, west of the Mount Diablo meridian; and thence due north to Puta Creek; and thence down said creek to the point where the South Fork of said creek intersects the line between ranges two and three east; and thence due east one mile, to the Sink of Puta; and thence due south until it intersects the Sacramento River, which will be near the mouth of Cache Slough; thence down said river to Suisun Bay; thence through the Straits of Carquines to the San Pablo Bay; thence up the said bay to the mouth of Guichica Creek; and thence in a direct line to the place of beginning. These lines will suit the people and the officers of the different counties better than any other that I can suggest. The lines necessary to be run then will be about thirty miles.

On the second subdivision of your circular, I would suggest that a very valuable improvement in the internal navigation of the State may be made, and thereby the development of the resources of the State will be materially promoted by cutting a canal from the Sink of Puta Creek to the Sacramento River, which I think does not exceed eight miles, and then by a series of locks, so as to secure a slack water navigation to the foot of the mountain - a distance of about twenty miles in a direct line. The inclination of this valley from the mountain to the tule, I think, does [not?] exceed six or seven feet to the mile. The advantages to be gained by this improvement is to drain a very considerable amount of overflowed land lying in the vicinity of the proposed canal, to create a water power for the manufacture of flour and other articles, and to convey cheaply to the market the products of this extensive and fertile valley. It is estimated that near a thousand tons of produce is now annually transported to Sacramento City, at a cost of no less than ten dollars per ton, and that this quantity of produce may be increased one hundred fold in that vicinity; the manufacturing of flour by steam power is always a very expensive one, and in this country, where fuel is scarce, must ever continue to be a heavy drawback on the profits of the farmer. The Dry Dock Company

at Mare Island have a dredge, or excavator, the original cost of which is about \$15,000, and can be worked at an expense of twenty-five dollars per day, and can excavate three hundred cubic yards to excavate three hundred cubic yards of earth daily. There would not be more than 205,000 cubic yards to excavate in the construction of this canal, and the expense need not exceed \$75,000. I am not prepared to make an estimate of the construction of the locks, but at all events the water power will pay for them.

Please excuse my delay in making this report, as it was not in my power to obtain earlier the information necessary.

Yours, etc.,

H. PATTON,
Surveyor Solano County.

NICOLAUS, SUTTER, CO.,
October 26, 1855.

To the Hon S. H. MARLETTE, Surveyor-General:

Sir:

In compliance with the tenth section of "An Act concerning the office of the Surveyor-General," passed April 17th, 1850, and in pursuance of your "Circular to County Surveyors," of July last, I have the honor of respectfully submitting the following report:

SUTTER.

Sutter is exclusively and agricultural and grazing county. Its area is about 400,000 acres, two-fifths of which would be considered overflowed and swamp or tule lands. One-fifth of this could, with comparatively little expense, be reclaimed, and made fit for agricultural purposes, but nearly the whole county is supposed to be covered by Mexican grants, which have not been segregated from the public domain yet, so that it is very unsettled how much of these lands will belong to the State. It would have been very desirous for me, if I had had the township plats of the United States surveys. Portions of the remaining three-fifths lands adapted to agriculture, are in a flourishing state of cultivation, notwithstanding the impediment of the uncertainty of land titles, and it does not require a great prophetic eye to foretell that Sutter County will, in the course of a few years, be one of the wealthiest in the State, for its rich alluvial soil is unsurpassed, and its relative position to the mines will insure a lasting home market for its stock and produce. Wheat, barley, oats and corn, the principal grains raised, yield abundantly. The blighting rust injured wheat some this season, but not near as much as in the valleys adjacent to the coast and bays. Potatoes, onions, cabbage, and all other vegetables, are profitably raised.

Little attention, with the exception of Gen. Sutter and a few others, heretofore has been paid to the culture of fruit and ornamental trees, grapes and garden fruits, but from the successful experiments that came under my observation, a brighter future is hailed to Sutter County, in making it paradisiacal for the future home of a large and prosperous population.

Internal improvements have not been made yet, but it is to be hoped that the people will direct their attention toward throwing up embankments, serving as levees, whereby large tracts of land could be brought within the reach of the plow, building turnpikes and improving the roads in general, so as to make them more passable through the rainy seasons.

The boundaries of this county, with the exception of the natural one of the Sacramento and Feather Rivers, are open and undefined. The easterly, or joint boundary with Placer County, runs from a point on the Sacramento, ten miles below the junction with Feather River, in a northerly direction, to a point on the east bank of Bear Creek, opposite "Camp Far West," frequently cutting farms diagonally. This line has once been surveyed in 1851, but as there is not timber on it, and the surveyors left no marks, it would have to be surveyed again. The northern, or joint boundary with Butte County, runs from a point on the west bank of the Feather River, opposite the mouth of Honcut Creek to the north point of the Three Buttes, thence due west to the Sacramento River. This line has never been surveyed, and will also at times run diagonally through farms.

It is apparent that these arbitrary lines are not as conveniently and permanently defined, not so generally known by the citizens at large, and will not consolidate the counties as well as the lines of the United States surveys, and as the United States Surveyors have sectionized contiguous to both of these boundary liens, it is generally hoped that the next Legislature in their wisdom will see fit to substitute for the northern and eastern boundaries of the county, the lines of the United States surveys.

That part of the joint boundary with Yuba County, defined by Bear Creek, from the mouth of the same, up to a point opposite Camp Far West, it is true, is defined by a natural boundary, yet it does not seem to meet the wishes of the people for many reasons, particularly for one in regard to the successful organization of Common School Districts. There is but a narrow belt of arable land on both sides of Bear Creek, intervened on both sides by high and barren plains from other settlements, and the inhabitants on one side alone live too scattering apart to have that very necessarily required institution of a good school organization, and as the citizens of the Yuba side have for the last two sessions of the Legislature unsuccessfully petitioned the same, praying to be annexed to Sutter County, I consider myself justified – having possibly gone beyond my proper sphere – to recommend very respectfully the substitution for Bear Creek, a line of the United States surveys, that would satisfactorily meet the wishes of the citizens.

I remain,

Very respectfully yours,

PHIL. E. DRESCHER,
Surveyor Sutter County.

WASHINGTON, Yolo Co., Nov. 15, 1855.

Hon S. H. MARLETTE, Surveyor-General:

Sir:

In reply to your circular to County Surveyors, of July 16, 1855, I have to say that in reference to many of the subjects mentioned therein it will be utterly impossible for me to transmit to you any information that will even approximate to accuracy; still, in accordance with your request, I will endeavor to embody some little data relative more particularly to those matters in this county brought under my professional observation.

BOUNDARIES OF THE COUNTY.

The boundary lines of this county have never been defined by any legal survey, although it is of very great importance that they should be so defined, not only on the score of revenue, but that citizens of the various counties may render themselves secure in their property.

The north line of the county, that is, the dividing line between Yolo and Colusi, is simply an imaginary one, that cannot be ascertained without a survey; its length is about thirty-five or forty miles, and should by all means be surveyed at as early a period as possible.

A portion of the southern line is described as being a direct line from the sink of Puta Creek to the head of the Merrit Slough. This line is nearly and north and south course, and would, I think be much better if it should be declared upon one of the township lines, according to the United States survey, due north and south, as recommended by Mr. Patton, County Surveyor of Solano; this would have the advantage of not cutting up and dividing farms in the manner the present line does, and would definitely settle its locality, greatly to the advantage of both county governments and citizens; this line would be about thirty miles in length, and it is of the utmost importance that it should be permanently located at the earliest possible opportunity.

SWAMP LANDS.

There is within this county a very large body of swamp and overflowed lands that, owing to the provisions of the law of the last session of the Legislature, providing for the sale of swamp lands, is excluded from sale, the result of which has been very detrimental to the best interests of the county. We have a frontage upon the Sacramento River, by the course of the river, of nearly, or quite, one hundred miles; the entire of the banks of the river during this distance are subject to annual overflow. A strip of land, however, immediately upon the bank, and varying from one-quarter to one mile in width is, however, tillable, (after the overflow has subsided,) nearly every year. This land is very generally settled upon, being laid out and claimed in tracts of one-half mile square, reaching back into the tule, as a general rule. Very many of these claims are very considerably improved by being fenced, leveed and cultivated. I am well

convinced that if the State would convey to these settlers its rights to their possessions for a fair and equitable consideration, but a very short time would elapse before the entire of the Sacramento River front of this county would be securely leveed and protected from the rise of the waters of the river, thus vastly increasing the taxable wealth of the county and State, as well as, at the same time, increasing in our midst a community of lords of their own soil, who, sitting under their own vine and fig tree, and having a permanent abode and interest with us, would be the best and safest safeguard of our political and moral interests, rights and liberties, and would vastly add to our standing and reputation both at home and abroad, as a permanent, prosperous, moral and law-abiding people.

This land is of unsurpassed fertility, and when once properly reclaimed and brought into cultivation, will furnish constant remunerative employment for a large body of industries and permanent citizens. The pecuniary benefit of the sale of these lands would go still further; it would not only give a certainty as to title, and consequently encourage permanent settlement and improvement thereon, but each settler upon the river bank would be willing and anxious to purchase, and ultimately reclaim the tule lands immediately back of, and adjoining to, him; thus procuring, not only the disposal of, but the permanent improvement and reclamation of land which would otherwise surely remain forever a useless waste; and further, were the overflow of the river itself restrained, it would be comparatively an easy task to dispose of the surplus waters of Cache and Puta Creeks, by means of which nearly the whole of this vast body of now swamp lands might be brought into the highest state of cultivation and improvement.

It is impossible for me to state, with any approach to accuracy, the amount of these lands, but they must embrace a tract of at least fifty miles in length by from four to six miles in width.

The amount of land in this county under cultivation is proportionately large, but I am not able to state the exact amount. The principal crops raised are wheat and barley. The wheat crop of the county has averaged thirty bushels to the acre; the barley crop thirty-five bushels per acre. Oats have proved a light crop during the last season, and but little sown. But little corn planted, which has, however, yielded well.

Upon the river lands there has been a large amount of sweet and Irish potatoes, cabbage, melons and vegetables of all description, raised, and the farmers upon these lands during the past year have generally been very successful in both the raising and disposal of their crops.

There are many young orchards, comprising the best varieties of apple, peach, pear, plum, fig, cherries and other fruits planted, which are all doing finely.

There are several vineyards in the county which, although only about three years old, are proving very lucrative. The number of vineyards in the county are constantly increasing.

More attention is gradually being paid to general farming and less to stock dealing, in the county. The quality, however, and consequently the value, of the stock is greatly increasing.

We only need a final settlement of our land titles to make our county the garden of the State, as well as its granary.

Messrs. Tufts & Lewis have just completed the erection of a turnpike road across the tule, three miles above Washington. The county is erecting another still higher up, and Mr. Jonathan Williams below, all of which will bring the back part of the county into closer proximity to market, and to a great extent do away with the difficulty hitherto experienced in reaching the river in the winter time.

I have already forwarded to you the amount of swamp lands taken under the Act of last winter.

If I had not been so greatly occupied with many important matters, I would have been glad to have made a much fuller report than is at present possible, and must, therefore submit the foregoing.

Yours, etc.,

WM. MINIS,
County Surveyor Yolo County.

APPENDIX E.

1. CIRCULAR TO, AND REPORTS FROM, COUNTY ASSESSORS.

CIRCULAR TO COUNTY ASSESSORS.

SURVEYOR GENERAL'S OFFICE.
Sacramento, March 1, 1855.

Sir:

I respectfully call you attention to the duties of your office in connection with that of the Surveyor-General.

From "An Act Concerning the Office of the Surveyor-General," passed April 18, 1850, I extract the following:

"Sec 9. He shall deliver to the Governor annually, on or before the fifteenth day of December, his report, which shall contain –

2. Plans and suggestions for the improvement of the internal navigation of the State, and for the construction and improvement of roads, turnpikes, railroads, canals and aqueducts; also, plans and suggestions for the planting, preservation and increase of forests of timber trees, for the draining of marshes, prevention of overflows, and irrigation of arable lands by means of reservoirs, canals, Artesian wells, or otherwise.

3. An estimate of the aggregate quantity of land belonging to the State, and the best information he may be able to obtain as to the characteristics of the same.

4. An estimate of the aggregate quantity of all lands used for or adapted to tillage and grazing within this State and each county of the State, together with a description of the locations in which the same may be situated.

5. An estimate of the aggregate number of horses, cattle, sheep and swine within the State, and each county of the State.

6. An estimate of the aggregate quantity of wheat, rye, maize, potatoes, grapes and other agricultural productions of the preceding year, together with his views as to the presence, cause and remedy of any disease or other mischief preventing a full and proportionate return and increase of the same.

7. An estimate of all mineral lands within the State, and each county of the State, and the quantity and value of each mineral produced during the preceding year, together with a description of the localities in which such mineral may be found.

8. All facts which may be within his personal knowledge, or which he may learn from reliable sources, and which may, in his opinion, be calculated to promote the full development of the resources of the State.

Sec.10. He shall address a circular letter to the County Surveyors and County Assessors, instructing them, and it is hereby mad a part of their official duties, to use their utmost diligence in collecting information relative to each and every matter mentioned in the ninth section of the Act, and to transmit to him, quarterly, at the Seat of Government, a report in writing setting forth the result of their inquiries.

Sec. 11. He shall, with his annual report, transmit to the Governor all reports which he may have received from his deputies, as mentioned in the tenth section of this Act.”

A careful examination of the sixth and eighth sub-sections will satisfy you that I am authorized and required to call upon you to “use your utmost diligence in collecting information relative to each and every matter mentioned” below, as I consider the same as “calculated to promote the full development of the resources of the State.”

Lands. – Agricultural, mineral, swamp, overflowed, subject to overflow, adapted to tillage, grazing lands.

Timber. – Oak, pine, red-wood, etc.

Acres and bushels of wheat, barley, rye, oats, Indian corn, buckwheat, peas, beans, Irish potatoes, sweet potatoes, turnips, beets, parsnips, carrots, onions, clover and other grass seeds, flax seed, etc. Melons, cabbage, pumpkins, etc.

Acres and tuns or pounds of hay, flax, hemp, sugar, rice, tobacco, cotton, etc.

Pounds of wool, beeswax, honey, butter, cheese, value of eggs, etc.

Fruit Trees. – Apple, peach, pear, plum, cherry, etc. Number and age, acres, amount of fruit.

Vineyards. – Vines, grapes and wine.

Live Stock. – Horses, mules, asses.

Neat Cattle. – Oxen, milch cows, calves, etc. Sheep, goats, swine, etc.

Value of animals slaughtered, value of poultry, etc.

Internal Improvements. – Canals, turnpikes, railroads, electro-magnetic telegraphs, etc.; length, original cost, cost of repairs, income, profits, etc. Incorporated bridge companies, toll-bridges, ferries, etc.; amount of stock or cost, income, etc. Artesian wells; number, depth, cost, discharge, kind and thickness of strata bored through, etc.

Steam and other Grist and Saw Mills. – Kind and amount of grain ground, run of stone, amount of flour, meal, etc.; kind, amount, cost and value of lumber; original cost, expense of running, profit, etc.

Quartz Mills and Mines. – Cost, value, etc.; tuns of quartz crushed, cost and yield per tun.

Manufactures. –

[Any meteorological tables or observations – in short, *all important facts* you may be able to obtain will be very acceptable.]

I respectfully request, as far as possible, the statistics of both the preceding and present years.

I will be obliged to you for any suggestions for the improvement of the boundaries of your county, by substituting *natural* for *artificial*, [arbitrary], or the lines of the *United States Surveys* for the present lines, or any other changes with a view to a better and more permanent sub-division of the State.

Please state the number of miles of boundary of your county necessary to be run prior to January 1st, 1857.

Your last report of this year should reach me by the first of November next, that I may avail myself of its contents in making our mine, which must be transmitted by the 15th of December.

I would respectfully urge upon you a careful examination of this circular, and a strict compliance with its requirements.

Please write upon but one side of the paper.

From "An Act Concerning the Office of the County Assessor," passed March 27, 1850, I extract the following:

"Sec. 5. If any Assessor shall, by himself or deputy, be guilty of any neglect of duty enjoyed on him by law, the Court of Sessions may make such deduction from his account for services rendered, as they may deem just and reasonable, and shall, moreover, be liable to indictment, in any court of competent jurisdiction, and fined in any sum not exceeding five hundred dollars."

In view of the great importance of having correct statistics of the State, also of the fact that scarcely a single Assessor sent in a proper report during the last year, I beg leave to state that the person or persons whose duty it may be to audit your accounts, will be urgently requested to co-operate with me in effecting a strict compliance with the law in this respect.

Please acknowledge the receipt of this immediately and oblige,

Very respectfully,
Your obedient servant,

S. H. MARLETTE,
Surveyor-General.

To ----- Esq., County Assessor ----- County.

OFFICE OF COUNTY ASSESSOR,
Sept. 22, 1855.

Hon S. H. MARLETTE, Surveyor-General:

Sir:

Herewith you will please receive our report of the agricultural products, live stock, etc., of this county for the current year, ascertained as near as may be, from inquiry and observation, to which we have given particular attention since the receipt of your circular, which was not until our work of assessment was somewhat advanced. Any further communication you may please to make to C. C. Breyfogle, Assessor of Alameda County, at Alvarado, will be thankfully received and shall receive prompt attention.

Respectfully yours, etc.,
C. C. BREYFOGLE,
Assessor Alameda County.

By R. P. Ranny,
Deputy.

Agricultural Products, Etc., of Alameda County, for 1855.

NAMES.	Acres.	Average Yield.	Aggregate.	REMARKS.
Wheat.....	20,000	23 bush.	460,000 bush.	Damaged by rust, smut and shrinkage.
“	1,938	Rusted.	Not cut.	
Barley.....	13,704	55 bush.	753,720 bush.	Crop not well filled, weighs light, estimate is by weight
Oats.....	9,637	50 bush.	481,850 bush.	
Rye.....	15	25 bush.	375 bush.	Used green on table.
Busk wheat.....	176	75 bush.	13,200 bush.	
Potatoes.....	4,514	75 bush.	338,450 bush.	Damaged by worm.
Indian Corn.....	412	40 bush.	16,480 bush.	
Cabbage.....	206			
Onions.....	99			
Beans.....	895			
Peas.....	135			
Beets.....	45			
Turnips.....	68			
Cucumbers.....	80			
Tomatoes.....	27	25 tuns.	675 tuns.	
Carrots.....	20			
Garden Veg's, various..	600			
Strawberries.....	27	1,500 lbs.	40,500 lbs.	Vines 1 yr. old, gen. Supposed.
Hay.....	2,700			
Apple Orchard.....	229			
Peach Orchard.....	72			
Vineyard.....	34			
Nursery.....	91			
Hedge, 2 ¾ miles				
Total acres.....	54,724			

Two Steam and one Water Flour Mills, having ten run of stones, capable of making 500 bbls. per day.

FRUIT TREES, ETC.

TREES.	1 yr. old.	2 yrs. old.	3 yrs. old.	4 yrs. old.	REMARKS.
Apple.....	15,676	24,131	9,450	410	Yield, 6,000 lbs. Older number not known.
Peach*.....	28,834	15,215	2,200	200	
Plum.....	1,199	2,511			
Fig.....	90	50			
Cherry.....	3,047	1,670			
Pear.....	3,780	1,000	45		
Quince.....	1,591	137			
Grape Vines.....	24,780	23,200	7,500		
Nectarine.....	800				
Apricot.....	1,700	300			
Currant.....	16,000				Supposed.
Ornamental.....		30,000			

* Seedlings of this year's growth, 43,000, generally budded; not all enumerated.

LIVE STOCK.

	No.
Horses.....	3,934
Colts.....	198
Mules.....	945
Jacks.....	50
Cows.....	3,432
Calves.....	2,061
Stock Cattle.....	11,218
Work Cattle, yoke.....	517
Sheep.....	8,306
Goats.....	482
Hogs.....	4,641
Hens.....	17,447
Turkeys.....	519
Ducks.....	628
Geese.....	170

BUTTER, CHEESE, ETC.

Butter, pounds.....	133,390
Cheese, ".....	100,000
Wool, ".....	24,918
Eggs, Hens, dozens.....	79,682
" Turkeys, ".....	530
" Ducks ".....	1,570

Hon S. H. MARLETTE, Surveyor-General:

Sir:

In compliance with your Circular, addressed to the County Assessors of this State, I beg leave to submit the following report of statistics of Amador County, for the year 1855:

LANDS.

On a careful investigation I find claimed for agricultural and grazing purposes, 34,333 acres of land, of which amount 4,529 acres are in actual cultivation.

GRAIN.

Acres in wheat, 1,006, which yielded at the harvesting of the same, 26,980 bushels. Acres in barley, 1,195, yielding 29,375 bushels. Acres in oats, 828, yielding 18,740 bushels. Acres grass, 1,200, yielding 1,700 tuns hay. Acres vegetables, 300, embracing every variety produced in this portion of the State.

FRUIT.

Apple trees from one to two year's growth.....	927
Peach trees " " "	1,458
Grape Vines " " "	4,730
Other fruit trees, including pear, plum, cherry and apricot.....	100

In connection with the above I would remark that the greater portion of the cultivated lands in the county are embraced in Lone, Dry Creek and Jackson Valleys; the first named being about five miles in length with an average width of about three miles, and formed by the delta of Sutter, Mule and Dry Creeks. The valley is surrounded by ranges of hills. Its soil is very rich and productive, being mostly composed of the vegetables mould and *debris* from the surrounding hills. This valley is well adapted to the production of all the several grains peculiar to the State, and indeed in all vegetable products of the county gives a prolific return to the labors of the husbandman.

The farmers of this valley are now to some extent turning their attention to the production of fruit, and so far as experience has tested its adaptation to this branch of industry and thrift, give satisfactory evidence of future abundance in all the varieties of middle and northern California. The same remarks will equally apply to Jackson and Dry Creek Valleys, both peopled with an enterprising, industrious and thriving population.

LIVE STOCK.

	No.
Horses.....	535
Mules.....	175
Asses.....	88
Neat Cattle.....	240
Work Oxen.....	453
Milch Cows.....	630
Yearlings and Calves.....	480
Sheep.....	934
Hogs.....	2,550
Goats.....	150
	<hr/>
Total Live Stock.....	6,235

SAW MILLS.

There are within the county fifteen saw mills – nine driven by steam and six driven by water power; original cost of construction, \$100,000; number of hands employed, about one hundred; average wages and board per month, sixty dollars. These mills are capable of manufacturing 9,850,000 feet of lumber, in the aggregate, per annum, at an average value at the mills of thirty dollars per 1000 feet,

Equal per annum to the sum of.....	\$295,500
Expenses per M in manufacturing, \$20.....	<u>197,000</u>
Net profits per annum of 15 mills.....	\$98,500

The timber used principally in the manufacture of lumber is the different varieties of pine peculiar to the mountains of this State.

GRIST MILLS.

One steam grist mill situated at Lone City, and one water grist mill on Indian Creek, dividing the two pairs of burrs each; original cost of the two mills, \$14,000, employing about seven hands. Within the past year these mills have manufactured –

	Pounds.
Flour.....	516,000
Barley for Feed.....	100,000
Indian Meal.....	<u>50,000</u>
Total.....	666,000

Receipts for Grinding.....	\$6,660
Expenses.....	<u>4,995</u>
Net Profit.....	\$1,665

The above mills for the past year have not been employed half their time owing to a scarcity of grain, which perhaps will not be the case in other years; and hence, if constantly employed, would pay at the above figure, a good interest on the original cost.

QUARTZ MILLS.

Within the county are thirteen quartz mills, driving one hundred and thirty stamps; eight of said mills are worked by water and five by steam.

I have only been enabled to obtain reliable statistics from six of these mills, as follows:

Amador Creek. – Spring Hill, Amador and Keystone.

Sutter Creek. – Amador No. 2, Eureka and Badger.

These six mills employ one hundred hands in the various branches of their operations, and use about fifty stamps.

The amount of quartz rock crushed per annum, in the aggregate, by these mills is 18,000 tuns, at an average yield of \$15 per tun.....	\$270,000
Aggregate expense attending the above six mills, including every expense, per annum.....	<u>133,000</u>
Net proceeds.....	\$137,000

I doubt not a number of other mills in the county are doing equally well; and so far as the problem of quartz operations in this county has been elucidated it has established the fact, that capital can seek no better or safer investment than the quartz of Amador, for sure, permanent and ample returns. Amador abounds in quartz ledges or veins penetrating her mountains and hills in every direction, and only requires capital and industry to make this county the most productive in the State in this branch of mining.

CANALS, DITCHES AND WATER RACES.

Thirty companies in this county are engaged in distributing the waters of various streams, by means of canals, ditches, races and flumes. Three hundred miles of canal ditches and flumes have been constructed at an average cost of \$450,000, the principal lines being, first:

Jackson Water Company Canal. – Water taken from the North Fork of the Mokelumne River, Tiger and Antelope Creeks. Size of canal, six and a half feet at the top, four feet on the bottom, and two feet in depth, capable of conveying one hundred sluice-heads of water, equal to 2,000 cubic inches. This canal is one continuous plank flume; present length including all its branches completed, thirty miles, supplying water to the southern part of Volcano and the rich mining locality of Aqueduct City, and

ultimately will be conducted to the mines of Jackson, supplying a rich and extensive mining country lying between Jackson and Aqueduct City, heretofore unworked for the want of water. When finished, this will be one of the most productive and valuable lines in the State, passing almost its entire length through a rich and inexhaustible mining region, it will furnish the means of working placer diggings, now idle for want of water, as well as motive power for quartz mills, and machinery of any desirable description. Some of the aqueducts on this line are carried for many hundred feet at an altitude of ninety feet, exhibiting in its construction great mechanical skill and architectural beauty.

Volcano Mining and Water Company. – Water taken from the tributaries of the North Fork of the Mokelumne River, and intended to supply the mines of Volcano and other localities. This canal was commenced in August last, and has been pushed on by its proprietors towards completion with great rapidity, thirty miles having been finished, and by the terms of existing contracts, the entire line, sixty miles, including all its branches, is to be finished by the fifteenth day of December next. This line is also of large dimensions, and will convey a noble volume of water, being seven feet at the top, two and half feet on the bottom, and four and half feet from top of the embankment, and capable, when full, of conveying eleven and a half cubic feet of water. This entire line will only require sixty or seventy rods of fluming, the canal following the high lands, or divide, between the waters of the Mokelumne and Cosumnes Rivers. From the altitude of the main trunk by lateral branches, its waters can be transmitted wherever a demand may exist, on either side. From the volume of water this line will be capable of carrying, it is in contemplation to erect saw mills and other machinery for manufacturing purposes along the line, using its water as the motive power. This line will also furnish water for driving quartz mills; and any amount of machinery may be driven by its waters, with but little or no loss, as the water, after being used at one point can be taken up and used to furnish power at another, and thus on through a vast round of useful and profitable employment.

Sutter Creek and Amador Company. – Water from Sutter Creek, twenty-five miles in length, and supplies water to the placer diggings along its line, as also motive power to several quartz mills, and this ditch to a certain extent exemplifies the great economy and many uses of a single head of water. A head of about sixty inches of water is taken from this ditch, and by means of a race is conducted on to an over-shot wheel, at the quartz mill of Messrs. Marden & Co., driving twelve stamps; from thence the same head is conveyed to the Herbertville Mill, at a lower altitude, where it drives a still greater number of stamps, and from thence conveyed to a wheel of the Keystone Quartz Mill, where it drives twelve stamps, and after leaving the last named mill is again taken up and on, to furnish placer diggings beyond.

Cosumnes Mining and Ditching Company. – Water from the South and Middle Forks of the Cosumnes River, a large and well constructed ditch, twenty-two miles in length, supplying the mines in the vicinity of Fiddletown; constructed at a cost of \$30,000.

Willow Spring and Michigan Bar Company. – Water from the South and Middle Forks of the Cosumnes River, and terminating at Michigan and Cook's Bar, passing through Willow Springs and Arkansas Diggings, and supplying a rich and extensive mining country along its entire line. This canal begins in El Dorado County, passing

through Amador, and terminates in Sacramento; entire length sixty miles, forty of which lie in Amador County; cost of construction about \$130,000.

Prairie Water Company. – Water from the Cosumnes River below all its forks beginning in El Dorado County, passing through Arkansas and Drummonsville, in Amador, and terminating at Katesville and the plains in Sacramento County; thirteen miles of the ditch is in Amador; entire length, forty miles.

The above are the principal canals in the county; twenty-four other ditches and races, varying from three to ten miles in length, take from the various streams within, and bordering the county, and supplying numerous mining camps along their lines and termini.

TELEGRAPHS.

A branch of the Alta Telegraph Line is now being constructed, starting from Sonora, where it intersects the line from Stockton and San Francisco, from thence to Mokelumne Hill, from thence to Jackson, thence to Volano, in this county; from thence to Indian Diggings, in El Dorado County, and connecting with the Sacramento line at Diamond Springs. Total length in Amador County, twenty-five miles.

Very respectfully,
Your obedient servant,

H. A. EICHELBERGER,
Assessor of Amador County.

BIDWELL, Sept. 28, 1855.

Hon S. H. MARLETTE, Surveyor-General:

Sir:

Incompliance with the requirements of the ninth section of an Act concerning the office of the Surveyor-General, send you the following statistical report for this county:

	Number.
Wheat, acres.....	1,865
" bushels.....	46,625
Barley, acres.....	2,400
" bushels.....	72,000
Oats, acres.....	175
" bushels.....	5,250
Corn, acres (destroyed by grasshoppers).....	18
Horses.....	1,588
Mules.....	376
Asses.....	27
American Cattle.....	9,726
Spanish " 	2,250
Calves.....	1,350
Sheep.....	3,636
Goats.....	127
Swine.....	7,550
Flouring Mills, driven by water.....	2
Runs of Stone, each.....	2
Saw Mills, driven by water.....	10
" " steam.....	4
Ferries.....	10

There is one incorporated bridge company now in the act of constructing a wire suspension bridge across the river at this point, with a span of two hundred and fifty feet and a width of eighteen feet in the clear. The capital stock of said company is \$39,000.

The cultivation of fruit trees, vines, etc., is now beginning to attract the attention of the farmers in this county. On the rancho of Maj. John Bidwell, situated on Chico Creek, can be seen a fine vineyard, besides a variety of fruit and shade trees. He would have had a large amount of peaches this season had it not been for the uncompromising grasshoppers, for they took the majority of them before they were ripe. The land seems to be very fertile in that section of the valley and well adapted to the raising of grain and fruit. The following is a list of fruit trees, vines, etc., on Maj. Bidwell's ranch:

Peach Trees, fruited.....	250
" in nursery.....	1,000
Apple Trees, ".....	100
Quince Trees, ".....	25
Pear Trees, ".....	100
Fig Trees, fruited.....	100
Grape-Vines, fruited.....	2,000
" in nursery.....	12,000
Tuns Grapes this year.....	12
Shade Trees – Yellow Locust, three years from seed, some of them sixteen inches in diameter.....	500
China Trees.....	50
Alanthus.....	25

I have learned that some of the officials of Yuba County are inclined to dispute the boundary line between the two counties; they claiming the so-called North Honcut as the line, but by reference to the official map of the State (which is very correct, so far as the Honcut is concerned), you will see that the South Honcut is the one spoken of on the map, and that it leads to the dividing ridge spoken of as the boundary line in the statute.

Very respectfully,
Your obedient servant,

MILES CHAPIN,
Assessor Butte County.

COLUSI, Oct. 3, 1855.

Hon S. H. MARLETTE, Surveyor-General:

Sir:

In obedience to the instructions contained in your circular addressed to County Assessors, allow me to submit the following report:

The number of acres of land in Colusi County, as near as I can estimate, is 1,792,000.

	Acres.
Mountainous Land.....	856,000
Valley Land.....	936,000
Claimed by Spanish Land Grants.....	241,845
Belonging to State.....	-----
Suitable for Cultivation.....	600,000
" Grazing.....	1,000,000
Under Cultivation.....	12,287
In Wheat.....	6,500
In Barley.....	5,287
In Oats.....	75
In Vegetables and Melons.....	125
	Number.
Wheat, bushels.....	101,050
Barley, ".....	94,066
Oats, ".....	1,500
Horses.....	1,604
Mules.....	262
Oxen.....	930
Cows.....	1,748
Mixed Cattle.....	8,132
Yearlings.....	1,387
Calves.....	867
Hogs.....	5,761
Sheep.....	4,122
Goats.....	4

Value of poultry, \$4,500.

Kinds of Timber. – In the valley, oak; in the mountains, oak and pine.

Fruit Trees. – Apples, none bearing; two hundred peach trees, bearing.

Two steam, grist and saw mills, each having two run of stone. Original cost of both, \$30,000.

Amount of grain ground per month, 25,000 bushels. Amount of flour manufactured per month, 5,200 barrels.

Crops of all kinds were much injured by grasshoppers; several fields of wheat were entirely destroyed by them.

Tuns of hay, 2,700.

Statistics for 1854.

	Number.
Acres under Cultivation.....	7,213
Wheat, acres.....	2,345
Barley, “	4,868
Hay, tuns.....	1,421
Horses.....	1,403
Mules.....	208
Cattle.....	8,989
Hogs.....	2,776
Sheep.....	2,995

Very respectfully,
Your obedient servant,

N. W. DUNN,
Assessor of Colusi County.

BROWNSVILLE, Oct. 15th, 1855.

Hon S. H. MARLETTE, Surveyor-General:

Sir:

I have the honor to transmit herewith my statistical report for El Dorado County for 1855. It is not as full as I could wish it, but it is as complete as circumstances will admit.

If it is the desire of our legislators to obtain correct statistical information, I would suggest the passage of an Act authorizing the officers whose duty it may be to collect the statistical data, to obtain the same under oath or affirmation; if this is not done no reliance can be placed in the statistics so obtained, nor will they be complete until such a system is adopted.

The following is as nearly correct as could be expected under the circumstances, viz:

Land inclosed for agricultural and grazing purposes, about 8,000 acres.

	Acres.		Bush.
Wheat.....	450	Yield per acre.....	26
Barley.....	340	“	28
Oats.....	387	“	25
Hay, acres.....	1,750	“ tuns.....	1 ¼

FRUIT TREES.

	Number.
Apple.....	1,608
Peach.....	1,159
Pear.....	34
Plum.....	40
Cherry.....	39
Fig.....	12
Apricot.....	15
Quince.....	25
Grape-Vines.....	3,000

ANIMALS.

Horses.....	907
Mules.....	384
Asses.....	65
Neat Cattle.....	1,281
Work Oxen.....	690
Milch Cows.....	769
Calves.....	519
Sheep.....	654
Swine.....	4,620

I think the number of swine might be put down at 8,000. The amount above is the number actually reported to me, but there is a great many running at large of which no correct account can be given.

Value of animals slaughtered per annum, \$600,000.

The above estimate is based upon information obtained from our most experienced butchers and cattle dealers, and is not far from correct; if anything, it is rather below the mark.

Value of poultry, \$5,000.

CANALS.

There are twenty principal ones in the county, sixteen of which have a never failing supply of water throughout the year.

	Miles.
Total length of main trunks and canals.....	475
Lateral branches of canals.....	325

Of the capacity I could not obtain any correct information. This I regret, inasmuch as canals are the principal property in the county, consequently the source of a large amount of revenue both to the State and county. I would like to see something done by our next Legislature toward obtaining correct statistics in relation to the cost,

capacity, etc., of canals within the State; such information would be a source of satisfaction to the people as well as of information and usefulness.

SAW MILLS.

Water Mills.....	16
Steam Power.....	24
	<hr/>
Total Mills.....	40

Many of these are not in operation owing to the fact that those mills which were erected in the years 1851-2, low down among the foot hills, have cut up all the timber in their immediate neighborhood. Many of them are being removed higher up on the spurs of the mountain, where an abundant supply of the finest timber is to be had, consisting of sugar, pitch, yellow and spruce pines, fir and cedar also abound; and ash, nutmeg, birch, yew and live oak are to be met with along the water-courses and mountain cañons. A good quality of black oak grows on the spurs of the Sierras, which is well adapted for wagon building. The market value of lumber varies from twenty to forty dollars per 1,000 feet.

QUARTZ MILLS.

There are seven in all in active operation, and some six or eight being built, besides a number of arastras used in prospecting.

This species of mining has lain dormant since 1852. It has recently received a new impulse, owing to the fact that several rich leads having been discovered and the means of saving the gold being better understood now than formerly. I think quartz mining will increase one hundred per cent. in El Dorado County within the next year. The county is traversed by numerous quartz lodes or veins, which are not yet prospected, many of them no doubt gold bearing. Marble also abounds in the western and south-eastern portions of the county, varying in Colusi from pure white to coal black. Some of it is of a beautiful gray or blended color, and all is susceptible of a high polish.

The amount of quartz crushed daily is about fifty tuns, yielding from twenty to eighty dollars per tun. Some of the mills have made as high as \$3,000 in a single week.

Placer mining is not confined to any particular portion of the county, but is co-extensive with its limits, and although some portions are fenced for agricultural purposes, yet it is liable to be dug up any day by the hardy miner in search of the yellow treasure. At no period since the possession of the country by Uncle Sam were prospects of the placer miners better than at present in El Dorado, if I except the want of that indispensable article, water.

- 1 Flouring Mill, not in operation.
- 8 Lime Kilns.
- 2 Brick Kilns.
- 15 Toll Bridges.
- 16 Miles of Toll Road, in connection with Toll Bridges.

3 Breweries.
2 Tanneries.
2 Soda Factories.

TELEGRAPHS.

The Alta Line enters the county on the west *via* Mormon Island, in Sacramento County; thence to Diamond Springs, Placerville, Coloma and Georgetown; thence to Auburn, etc., in Placer County. Length of wire in El Dorado County, seventy-five miles.

COUNTY BOUNDARIES.

The southern boundary of this county was changed by an Act of the last Legislature, which does no credit to the geographical talent of that Body. They were either sadly misinformed or totally ignorant of the geography of the county. They constituted an air line, commencing at the eastern boundary of Sacramento County, running thence to the South Fork of the South Fork of the Cosumnes River, the boundary line between the Counties of El Dorado and Amador. The said air line upon being applied to *terra firma* by our County Surveyor, was found to cross the Cosumnes River four times within the distance of eight miles, and below all the forks of the stream, thereby rendering it almost impossible for the collecting officers of either counties to ascertain when they are within their respective counties. That it would have been better to have substituted the natural (the stream) for the artificial boundary, no sane man will deny. But our Legislative Solons thought differently.

The boundary as at present fixed is not satisfactory to a large portion of the people living in the territory, or district, annexed to Amador. I know by personal observation the people desire to remain in El Dorado County, and if the question was left with the people of the district to decide, they would undoubtedly vote to remain in El Dorado County. In other words, they would vote for making Dry Creek the southern boundary of El Dorado, which is a natural boundary, and, therefore, preferable to any *air line* or other artificial one.

I remain Respectfully, etc.,

J. McKNIGHT,
Ex-Assessor of El Dorado County.

LOS ANGELES, Oct. 22, 1855.

Hon S. H. MARLETTE, Surveyor-General:

Sir:

According to my duty, and in compliance with your circular issued March 1, I report to you as follows for the present year:

Los Angeles County, one of the richest and best of the southern portion of the State, is of large extent and will admit of a large population. Within its limits are irrigable and arable lands, of natural wetness, of temporal fields of pasturage, with watering places for cattle; water sufficient to irrigate more than a hundred thousand acres of land; a temperate climate, extremely healthy – great elements and sufficient resources for progress and for the comforts of life, and the only thing wanting is population.

In regard to productions, it has good timber, pine of several classes, oak and other trees; produces wheat, oats, barley, corn, beans, peas, garbanzas, lentines, cotton, tobacco, sugar cane, flax and linen; fruit in a large variety, such as pears of every description, apples, cherries, apricots, peaches, almonds, nuts, oranges, limes, citrons, olives, grapes, sweet potatoes, watermelons, muskmelons and vegetables of all kinds.

Its fields fEEd –

	Number.
Gentle Cattle.....	102,000
California Oxen.....	1,181
" Milch Cows with Calves.....	1,450
American Oxen.....	365
" Milch Cows.....	696
" Cattle.....	467
Wild Horses.....	16,300
Gentle Horses.....	3,540
Sheep.....	28,538
Hogs.....	1,900
Mules.....	1,299
Goats.....	600
Asses.....	260
Total.....	158,596

The cultivated lands are of –

	Acres.
Temporal.....	8,000
Natural wetness.....	2,000
Irrigated.....	13,000
Total.....	23,000

And have produced –

	Quintals or Cwt.
Grapes.....	41,004
Wheat.....	10,700
Corn.....	26,030
Beans.....	8,654
Potatoes.....	6,700
Oats.....	500
Sweet Potatoes.....	450
	<hr/>
Total cwt.....	940,038

Besides the fruit trees, melons, squash and other vegetables, of which I have not been able to ascertain the amount.

There is also a salt lake situated on the western part of the San Pedro Rancho, where is established the Pacific Manufactory Salt Works Company, and taken together, the artificial and natural products make the amount of 10,000 quintals, or 1,000,000 pounds.

Tuns of hay that have been cut, 1,300.

The sheep have produced of wool, 500 quintals, or 50,000 pounds.

In regard to the mineral resources of the county, there are none at present being worked, but the old “diggings” of San Francisquito, in which about eighty persons are employed, and another in the Curra of Azusa, where are at work about forty persons, and both produce an average of from one to three dollars per day to each person.

With respect to improvements, there has been a regular reformation of the old and building of a large number of new houses.

Two new and excellent flour mills, water power, in addition to the number of last year.

The cultivation of land has increased, also the planting of trees and vineyards.

The sinking of a well that has reached the depth of five hundred and seventy-five feet, is progressing, and which has cost the sum of \$3,000.

Our roads have also been considerably improved.

Your obedient servant,

A. F. CORONELL,
Assessor Los Angeles County.

TOMALES, October 4th, 1855.

Hon S. H. MARLETTE, Surveyor-General:

Sir:

The following are the statistics of Marin County for the year 1855:

There have been 2,490 acres of wheat sown, of which 2,028 is entirely destroyed by rust and smut, leaving only four hundred and sixty-two acres that has been harvested, and the largest portion of that is unfit for milling. Eight hundred and ninety-four acres of oats; rather light crop. Seven hundred and forty-four acres of barley; also light. Eight hundred and fifty-nine acres of potatoes, of which not over three-fourths will be harvested. The yield will not exceed thirty sacks to the acre of merchantable potatoes. One hundred and eighty acres of white beans; all good, will yield well.

LIVE STOCK.

Horses.....	3,522
American Cattle.....	2,982
California Cattle.....	14,793
Hogs.....	4,027
Sheep.....	2,589

The amount of taxable property is \$833,679.

FRUIT.

There are but two orchards worthy of note. Capt. J. A. Morgan, who lives within one hundred rods of the beach of the ocean, has five hundred apple trees, forty pear, sixty peach, plum, quince, cherry, and some grape vines, all growing finely, and about one-fourth of the apple and pear trees are bearing full of the choicest of fruit. P. B. Hewlett has a fine variety of trees and vines, but all are quite young.

I would suggest the immediate survey and location of the boundary line between this and Sonoma County – as much trouble has arisen, and more will be without the line is located by survey.

Yours, respectfully,

WARREN DUTTON,
Assessor Marin County.

Hon S. H. MARLETTE, Surveyor-General:

Sir:

In compliance with the request contained in your circular letter, I respectfully submit the following report:

There were sown the past season in this county –

	Acres.
Wheat.....	11,058
Barley.....	1,584
Rye.....	120
Oats.....	770
Corn.....	488
Buckwheat.....	20
Peas.....	72
Beans.....	95
Potatoes.....	61
Melons.....	47
Onions.....	10

The yield of grain was very light. The wheat crop cannot be estimated over twelve bushels to the acre, and barley at about twenty bushels. The soil is well adapted to the cultivation of grain, and produces abundantly. Vegetables require irrigation. The rust, the past season, acted most injuriously upon all the grain crops, but more especially upon that variety of wheat known as the Club Head. There was much of this variety sown, though very little harvested. The reason of this variety suffering most is, it is an earlier wheat, and during the few days when the causes of the rust were acting, it was in a state to receive the greater injury.

This disease is a new one for this section of the State, and is to be attributed to the peculiarity of the season.

During the latter part of winter the weather was very mild, with sufficient rain to give vegetation a rapid growth. The rains continued later than usual, and were followed by extremely hot days. These had the tendency to hurry the ripening. The nights are cool, and through the summer the fogs from the bay will visit the valley toward morning, which is soon dispersed again by the sun. This change, thus altering between excessive hot days and cool nights, while the plants was in that tender state, consequent on such a rapid growth, caused the straw to split, and the exuding of the sap, exhausting the substance of the plant, prevents the grain from filling, and forms a rust. That the fogs contributed to this disease, is proved from the fact, that where they were the heaviest and remained the longest, the rust was the most fatal. The smut, also, done considerable injury to many crops.

As a remedy for this disease, I would recommend more care in the selection of seed, for if smutty wheat is sown, the infection will be extended to the growing crop; on the other hand, if clean, healthy seed is sown, a healthy crop is much more certain to follow.

	Acres.
Amount of land under cultivation, as above given.....	14,325
Occupied by gardens, vineyards and orchards.....	675
Total amount under cultivation.....	15,000

Whole number acres assessed in the county, 250,347; nearly all of which is adapted to grazing or tillage.

	No. lbs.
Hay.....	9,126,000
Wool.....	11,197
Butter.....	58,310
Cheese.....	17,537

	Number.
Apple Trees.....	16,062
Peach “.....	66,962
Pear “.....	6,129
Apricot “.....	500
Cherry “.....	525
Plum “.....	650
Quince “.....	337
Fig “.....	275

The valley is well adapted to the cultivation of fruit. The growth of the tree is rapid, and much attention is being paid to obtain the best varieties. Messrs. Kellogg, Hudson and Nash, the pioneers of this county, have each very fine orchards, which have born sufficient to test the quality of the fruit, and are beginning to reward their owners for the labor and expense incurred to procure them.

There are many other large orchards under way. The mode of cultivation is generally by irrigation, but as there are so few locations where sufficient water can be obtained to irrigate an orchard, I would call attention to the plan adopted by Messrs. Thompson, of Suscol, in this county. It is subsoiling.

They have in one orchard about 30,000 trees, (apple and peach,) and their growth the past season proves the efficacy of their mode of culture. The ground, in the first place, was broken up to the depth of twenty inches to two feet, then thoroughly harrowed with a long sharp-toothed harrow; thus pulverizing the soil to a sufficient depth, that it retains the moisture as it rises from the earth. When the advantages of subsoiling are more generally understood, it will be more generally adopted, not only to the cultivation of fruit trees, but of grain also.

Another great advantage in the culture of fruit trees is, to keep the ground perfectly clean. No weeds, grass, grain, or vegetables even, should be allowed in an orchard, for they draw to their own support much of the nutriment and moisture that would otherwise have nourished the tree. This is particularly true, where water cannot be obtained for irrigation.

These remarks apply equally well to the cultivation of the vine also. There are now 57,500 vines in the county, estimated to yield three lbs. of grapes to the vine. Attention is being called to the culture of the grape, and with the advantage of climate and soil, if skillfully followed, this might be made a lucrative employment.

	Number.
Horses.....	4,114
Mules.....	290
Oxen.....	3,616
Cows.....	9,093
Young Cattle.....	4,670
Hogs.....	12,011
Sheep.....	5,396
Goats.....	65
Value of Animals Slaughtered.....	\$20,000
" Poultry.....	14,000
" Eggs.....	<u>13,124</u>
Total.....	\$47,124

There are two steam flouring mills with four run of stone; three water do. with four run of stone; and one steam and four water saw mills.

For amount of swamp and overflowed lands, internal improvements and similar information, I would refer you to the report of the County Surveyor.

All of which is respectfully submitted.

JOHN COBB,
Assessor Napa County.

COUNTY ASSESSOR'S OFFICE,
Nevada City, October 1, 1855.

Hon S. H. MARLETTE, Surveyor-General:

Sir:

In compliance with the requirements of the law, as contained in your circular of March 1, I take pleasure in submitting to you the following statistics. I have used every exertion to collect them accurately, and wherever the necessary data could not be

obtained I have availed myself to the opinions and advice of some of our oldest and most experienced citizens, in making estimates in their stead.

The principal part of this county is mountainous, and unfit for extensive farming, and up to this time the ranchos are generally confined to the valleys and flats, which, however, produce grains and vegetables of superior quality, and in the utmost profusion.

The quantity of land claimed by actual settlers is 29,974 acres, the assessed valuation of which is \$192,375. Of these lands, only 4,300 acres are now under cultivation, divided as follows:

	Acres.
Wheat.....	1,100
Barley.....	1,500
Oats.....	350
Indian Corn.....	50
Hay.....	700
Potatoes.....	300
Other vegetables.....	300

Fruit trees are as yet very scattered over the county, and but few of them in bearing this season; they appear however to flourish well, and grow with remarkable rapidity – peach trees often producing perfect fruit in two years from the seed. Considerable interest is manifested in their culture, and in a few years our county will be well stocked with the different varieties. Present number of fruit trees, 32,00, of which about three-quarters are peach. Grape vines, as well as different varieties of berries, are being introduced to some extent, and appear to do well. Stock raising is not followed here as a separate business, and we depend mainly on the lower counties for our supplies of animals.

Number of Horses and Mules in the county.....	1,500
“ Cattle.....	2,300
“ Swine.....	7,800

There are in the county forty-four ditch companies supplying the mines with water. The ditches have generally been carried through by men of limited means, and under disadvantages which have in many cases swelled the actual cost of them far above their present value, though the majority of them pay well, and some very largely. Aggregate length of ditches, 682 miles. Assessed valuation, \$345,900.

These ditches furnish a good supply of water during the winter and spring, but the majority of them become entirely dry during the summer. The general price of water is fifty cents per inch.

We have eight toll bridges, with an aggregate assessment of \$26,300.

Probably the most important branch of industry in the county is quartz mining. The reaction which succeeded the wild excitement arising from the discovery of gold-bearing quartz, brought ruin to hundreds of our citizens, and cast a discredit on the business which for a long time deterred capitalists from engaging in it, but the industry

and perseverance of a few individuals has at last demonstrated the practicability of working these mines profitably, and now the business is established on a firm basis, and is looked upon by those engaged in it as being the most profitable and permanent of all the different branches of mining. We have now in active operation in the county, sixteen quartz mills, of which five are run by water.

Aggregate tons of rock crushed in a year, 75,000. Average value of rock per tun, \$25.

Cost of raising and crushing, per tun, \$15.

Aggregate value of mill machinery, \$300,000.

The majority of the ledges from which this rock is taken have not as yet been opened to any great extent, only eight out of one hundred and fifty being below the water line, but enough has been ascertained to give assurance to the richness and permanency of these mines, and induce those interested to make improvements of a more substantial and costly nature than have heretofore been made. As any estimate of the value of these mines would be a mere conjecture, I refrain from giving one. The amount, however, of the original investments would probably exceed \$2,000,000.

We have in operation twenty-seven mills, besides five attached to quartz mills. These mills are capable of cutting 2,000,000 feet of lumber per month. The timber is very large and fine on the ridges, and consists of the ordinary varieties of pine and cedar. The sugar pine is the best, but is becoming somewhat scarce in the neighborhood of the older mills. Large quantities of lumber are sent by wagons to Marysville and Sacramento. The value of rough lumber here is from \$20 to \$25 per M. There is one grist mill in the county, employing a capital of \$25,000, and manufacturing about 5,000 barrels of flour per annum, valued at \$60,000, besides grinding twenty tons of barley per month.

In regard to the produce of our mines, it is difficult to arrive at any accurate figures on the subject, but judging from the amount of dust brought into our banking and express offices, we can safely set the annual yield at \$5,000,000.

I can unfortunately give you but few meteorological facts of interest. I have endeavored to ascertain the quantity of rain, etc., for the past year, but could meet with no one who keeps a gauge. From a thermometrical register, however, showing the average temperature of each month, from January, 1854, to July, 1855, inclusive, at different periods of the day:

METEOROLOGICAL OBSERVATIONS.

Month.	1854.				1855.			
	6 A. M.	Noon.	6 P. M.	Midnight.	6 A. M.	Noon.	6 P. M.	Midnight.
January...	28°	52°	37°	27°	33°	49°	45°	36°
February...	36	51	42	37	38	60	48	40
March.....	36	56	47	38	41	60	53	44
April.....	43	64	57	44	41	62	55	43
May.....	49	70	63	49	44	64	57	45
June.....	54	78	72	52	58	86	78	57
July.....	64	96	87	63	62	97	85	59
August.....	59	90	82	58				
September.	51	87	74	53				
October.....	47	72	59	53				
November...	41	79	58	43				
December...	37	68	43	36				
Average of the year.....	45	72	60	46				
Highest range, July.....	74	110	100	76	75	110	99	68
Lowest range, Jan.....	10 below	30	6	6 below	17	31	29	26

All of which is respectfully submitted,

JOHN McCOY,
Assessor of Nevada County.

ASSESSOR'S OFFICE,
Auburn, Nov. 26, 1855.

Hon S. H. MARLETTE, Surveyor-General:

Sir:

In compliance with your instructions I beg to make the following report:

This county covers a large territory, bordering on, and nearly surrounded by, four others, viz: Nevada, El Dorado, Sacramento and Sutter, the defined and undefined lines of the same, the County Surveyor will furnish you a report, as per instructions.

The County of Placer, like many of the northern, is naturally divided into lands adapted to mining and agriculture, and each section is generally improved as such. The western or agricultural, joining Sacramento and Sutter, lies below, or west of, what is

termed the foot-hills. Into this section the streams that rise in the mountainous sections course their way until lost in the Plains of the Sacramento Valley, or empty into some of the principal rivers, along whose banks are spread out in one great level plain, the most desirable farming lands. All of these lands have been long located, and on which are many good and permanent improvements. These ravine bottom lands are desirable on several grounds – water for stock and domestic use in abundance during the long dry season, banks lined with timber, affording firewood, and shade groves for stock. There are a few ranchos in isolated spots, scattered through other sections of the county, on the mountains and rivers, but generally speaking, agriculture is confined to this section.

The principal production of these lands are wheat, barley oats and hay, though experimental crops in corn and other grains have been planted in several instances. The number of acres sowed, and the average per acre of any of these crops, it was impracticable for me to obtain, as a considerable portion of this property was assessed by my predecessor, who held this office until June last. Had I made the entire assessment, it would have afforded me the greatest pleasure to have noted closely and particularly, every statistic called for by your instructions, beside others which in my discretion would have contributed to external general information, and promote in the least the general interest of the State.

Through the agricultural, or lower, portion of this county, and a portion of the adjoining Counties of Sacramento and Sutter, is a general grazing depot, where stock crossing the plains the year previous, and young and poor cattle from the southern counties, are kept and fattened for market. During the whole season, from this section, little bands of cattle are driven north, east and south, for immediate slaughter. Among those citizens of our county are many enterprising and thrifty farmers.

No reliable or correct record of the number of cattle, sheep, hogs, etc., in the county, can be given.

During the past year or two considerable attention has been given to the introduction of horticulture. A number have planted the different fruit trees, together with the grape, and are patiently awaiting time to decide the important problem. These experiments are not confined to the agricultural portion proper, but are general.

The following tabular statement, from an amateur farmer residing near Auburn, has, perhaps, the largest and most advanced orchard in the county:

	1 year.	2 year.	3 year.	4 year.	Total.
Apple Trees.....	30	34	25	15	105
Pear “	5	5	5		15
Peach “	8	4	5	4	30
Cherry “	3		10	4	17
Plum “	3	2			5
Apricot “	6				6
Quince “	6	4			10
Grape-Vines.....	5	10	10		25

RANCHOS.

There are one hundred and forty-three improved ranchos in the county, many of which have good and permanent buildings and fences, others are only inclosed with brush, while some are only surveyed and staked out.

The improvements and stock on these ranchos are assessed at \$219,000, paying a tax as follows:

State tax, sixty cents on the one hundred dollars.....	\$1,314 00
County tax, one hundred and five cents on the one hundred dollars. _____	3,613 50
Total.....	\$3,613 50

The tax valuation of this property has gradually increased, and but for the conflicting interest between the farmer and miner, would have been double what it now is. The decision by the courts, giving the miner the right to enter upon, and dig any lands in the mineral districts, is a check upon improvements on this kind of property. Some of the most valuable ranchos in the county are suffering by this decision.

CANALS.

Auburn and Bear River Water and Mining Company. – Capital, \$650,000. Length of canal, including laterals, one hundred and seventy-five miles. Office at Auburn.

American River Water and Mining Company. – Capital stock, \$300,000. This canal is located on the west bank of the American River, taking its water at Tamaroo Bar, in this county, and leading to the Mississippi Bar, in Sacramento County. Its length is about thirty miles, twenty of which is in Placer.

Gold Hill and Bear River Water Company. – Capital stock, \$96,000. Main trunk, thirty-two miles; lateral, twenty-six miles. Office at Gold Hill.

Yankee Jim Union Water Company. – Capital stock, \$90,000. Office at Yankee Jim's.

El Dorado Water Company. – Capital stock, \$60,000. Length of canal and laterals, thirty miles. Office at Michigan City.

Todd's Valley Water Company. – Capital stock, \$32,000. Length of canal, twelve miles. Office at Todd's Valley.

The above list includes the principal incorporated canals of the county. Aside from these, there are twenty-three others, of smaller capacity and capital. Many of them are of great value to the miners as well as the capitalists, and pay a better interest on the amount invested than some of the larger companies. The assessed value of the twenty-nine canals in the aggregate, is \$375,000.

SAW MILLS.

There are about twenty saw mills in operation in the county, which annually produce many million feet of lumber – the exact amount I had no means of ascertaining. The trade is one of the most important in the county, and one which is increasing in growth and prosperity. A share of this lumber is consumed in the county for buildings,

fences, flumes and mining generally, but an important trade between these mills and the City of Sacramento, is carried on, at which point it comes in competition with the Oregon lumber – that city being the highest point that lumber reaches into the interior. The assessed value of these mills is \$86,000.

State tax, sixty cents on the one hundred dollars.....	\$516 00
County tax, one hundred and five cents on the one hundred dollar...	<u>903 00</u>
Total.....	\$1,419 00

TOLL ROADS AND BRIDGES.

There are nine toll roads and bridges in the county, the assessed value of which is \$71,000.

State tax, sixty cents on the one hundred dollars.....	\$426 00
County tax, one hundred and five cents on the one hundred dollar...	<u>745 50</u>
Total.....	\$1,171 50

PRINCIPAL STREAMS.

1. *Bear River.* – County line between Placer and Nevada Counties.
2. *North Fork of the American.* – Course southwest , through about the center of the county.
3. *Middle Fork of the American.* – Southern county line between Placer and El Dorado Counties.
4. *North Fork of the Middle.* – A branch of the same bearing north.
5. *Middle Fork of the Middle Fork.*
6. *North Fork of the North Fork of the American.*
7. *South Fork of the North Fork of the American.*
8. *Sacramento River.* – Touching Placer on the west, which is the initial point of the west line.
9. *Shirt-tail Cañon.* – A long, deep cañon, emptying into the North Fork.
10. *El Dorado Cañon.* – A cañon emptying into the North Fork of the Middle.
11. *Secret Cañon.* – A branch of the North Fork of the Middle.
12. *Volcano Cañon.* – Emptying into the South Fork.
13. *Humbug Cañon.* – Emptying into the South Fork of the North Fork.
14. *Indian Cañon.* – Emptying into the North Fork of the American.

These rivers, forks and cañons, excepting the Sacramento, are all mountain streams. The action of these waters, during the lapse of ages, have worn deep passages and channels through the mountainous country they occupy, leaving the banks high and precipitous, as well as picturesque. On the North Fork of the American, between Ford's Bar and Green Valley, the banks are so abrupt, ragged and rocky, for a distance of about five miles, that the miners located thereabouts are compelled to use boats in passing to and from their claims. The height of these mountain river banks vary from one to four miles.

CAPITAL INVESTED IN GOLD MINES.

The amount assessed on capital invested in gold mines in the county, is \$100,000, which has been assessed only on productive claims. The total tax on the same, State and county, is \$1,650. When the still larger amount of capital invested in drifts and tunnels shall become productive, as a large share of it no doubt will, the revenue from this source will be very greatly augmented. At present it is believed to be greater than any other county.

QUARTZ.

There are but two successful quartz mills in the county, both of which have gotten into operation during the present year. They were both built as *experimentors* or *prospectors*, and with steam power only sufficient for six stamps. Messrs. Strong & Co., near Humbug Cañon, in the extreme eastern portion of the county, have the honor of putting into operation the first successful quartz mill, and Messrs. Hancock & Watson, the second, which is located at Sarahsville, near Michigan Bluffs. These gentlemen are the successful pioneers in the mode of mining which is to succeed eventually placer diggings. When these old surface washings shall have been forgotten, the sound of the quartz stampers will be heard from almost every ledge which the miner now daily passes without notice.

MINING IN GENERAL.

The rivers and ravines, hills and flats of Placer County, since the ever memorable year of 1849, have gained a reputation throughout the State for richness not inferior to none; and notwithstanding the immense amount of wealth removed from them, they still continue to yield a fair reward to the industrious miner. There yet remains, almost untouched, a section of placer diggings across the full extent of this county, from Bear River to the American River, adjoining the Sacramento Valley, which will yield good wages when it is supplied with water.

The assessed value of the taxable property in this county, for the year of 1855, is \$1,700,000.

The above is the most full and correct report I can make with the materials in my possession. Hoping to be more diligent and successful in the future,

I remain,

Very respectfully,

Your obedient servant,

A. S. SMITH,

Assessor Placer County.

AMERICAN VALLEY, July 1st, 1855.

Hon S. H. MARLETTE, Surveyor-General:

Sir:

Your communication of date of March 1, and with mail mark upon it March 28, only reached me about one week since, entirely too late for my full compliance with the requirements of your circular. My duties as Assessor are nearly completed, and my acts as such have been governed by the light furnished by the law as contained in our court at the capital of our county. Many of the requisitions of your circular have been omitted in my report, because they were unknown to me. I regret exceedingly that your instructions to me have been so long in their passage, and although I cannot meet the command of a full report by the first of September, I will do my utmost to repair the error by going over my district again, and collecting all the information I can obtain in relation to the different subjects by which it is believed the resources of our State may be fully developed.

I herewith transmit you a report of inquiries, so far as I have gathered them, and will promptly forward such other information as I can acquire in my second canvass of the district at as early a period as possible.

AGRICULTURAL LANDS.

My information only extends to lands claimed, being in amount 14,604 acres.

MINERAL LANDS.

The almost entire surface of this county may be placed in this class of land, as gold is found extensively throughout the whole county, being the only mineral as yet made available.

SWAMP LANDS.

My information is limited with regard to this class of land, and is not offered as reliable authority. There is a large tract of land known as the "Feather River Meadows," situate in this county. This, in connection with other less extensive tracts, may be estimated to contain from 4,000 to 5,000 acres of land that would be denominated low or swamp lands.

LANDS ADAPTED TO TILLAGE.

By far the larger proportion of land contained in this county is unsuited to tillage, the face of the country being extremely mountainous, the summits of many of them being covered with perpetual snow; still there are to be found many beautiful valleys, interspersed here and there, protected from the rigor of the climate and the violence of the storm, by the wall of hills surrounding them, that are available for tillage, and will undoubtedly become of great value for that purpose.

GRAZING LANDS.

These are usually to be found in the valleys, which are mostly covered with a luxuriant growth of grass, while our hill-sides, with few exceptions, are destitute of vegetation.

TIMBER LAND.

The principal growth of timber are pine, spruce, and such other kinds as are usually found on the higher mountains, with a smaller proportion of oak.

GRAINS AND VEGETABLES.

In reference to these articles, I have to say that my report must be incomplete, their production being extremely limited in many cases, so much so as scarcely to be worthy report on the Assessor's books.

	Bushels.
Wheat.....	5,765
Oats.....	1,015
Barley.....	854
Potatoes.....	2,530
Indian Corn.....	5
Tuns of Hay.....	1,500
Pounds of Butter.....	2,000

LIVE STOCK.

Horses and Mules.....	411
Asses.....	65
Oxen and Cows.....	715
Hogs.....	1,000

INTERNAL IMPROVEMENTS.

The infancy of this county precludes the possibility of their being many improvements of this character.

Saw Mills, 11; kind, amount cost, and value unknown. Grist Mills, 1; two run of stone, rest unknown. Quartz Mills, 6; statistics at present unknown.

All of which is most respectfully submitted.

CHRISTOPHER PORTER,
Assessor of Plumas County.

By MARTIN R. STREETER, Deputy.

SACRAMENTO, Oct. 1st, 1855.

Hon S. H. MARLETTE, Surveyor-General:

Sir:

Having received your Circular, I herewith transmit to you the following statistics of Sacramento County:

GRAIN.

No. acres of Wheat.....	5,191
“ Barley.....	5,447
“ Oats.....	1,547
“ Corn.....	204
“ Buckwheat.....	11
“ Rye.....	3
“ Broom-corn.....	5
“ Flax.....	1
	<hr/>
Total No. of acres of Grain.....	12,409
No. tons of Hay.....	5,207

Wheat will average 25 bushels to the acre, making in all 129,775 bushels, equal to 26,000 bbls. flour. Barley will average 30 bushels to the acre, making in all 163,410 bushels.

VEGETABLES.

No. acres Irish Potatoes.....	303
“ Melons.....	191
“ Cabbages.....	159
“ Onions.....	125
“ Sweet Potatoes.....	89
“ Peas.....	76
“ Pumpkins.....	72
“ Turnips.....	64
“ Beets.....	63
“ Beans.....	54
“ Carrots.....	56
“ Parsnips.....	47
	<hr/>
Total No. of acres of Vegetables.....	1,299

FRUIT TREES, VINES, ETC.

	Number.
Apple.....	15,405
Peach.....	27,102
Pear.....	4,173
Plum.....	5,927
Cherry.....	1,993
Apricot.....	886
Quince.....	836
Fig.....	514
Almond.....	4
Grape-Vines.....	33,180
Currant and Gooseberry Bushes.....	<u>526</u>
 Total.....	 90,554

Half the above are one year old; balance from two to four years.

LIVE STOCK.

	Number.
Horses.....	1,906
Mules.....	231
Asses.....	11
Cows.....	4,860
Calves.....	2,749
Beef Cattle and Oxen.....	3,322
Bulls.....	12
Sheep.....	7,678
Swine.....	5,949
Goats.....	<u>93</u>
 Total.....	 26,811

Ten thousand head of Sheep were sold and driven from the county just previous to the assessment.

POULTRY.

	Number.
Chickens.....	18,522
Turkeys.....	971
Peacocks.....	<u>3</u>
 Total.....	 19,496

ANNUAL PRODUCTS OF DIARY.

	Pounds.
Butter.....	56,136
Cheese.....	<u>49,940</u>
Total.....	106,076

CANALS, BRIDGES, MILLS, ETC.

Seven Steam Flour Mills, with twenty-one run of stone, grinding six hundred and thirty barrels of flour per day. Value of Mills, \$66,000.

Two Steam Saw Mills, which saw 2,500,000 feet of lumber per annum. Value of Mills, \$35,000.

Two Iron Foundries.

Ten Bridges – total length, 4,000 feet; cost, \$307,800; annual income, \$39,000.

Seven Ferries – cost \$3,800; annual income, \$9,200.

One Plank Road, ten miles in length; cost, \$60,000. Lately bought by Board of Supervisors, for \$26,000.

Ramsdell & Co.'s Distillery. – Steam power, consuming one hundred and twenty bushels of grain per day, making three hundred and sixty gallons of whisky per day. Value of Distillery, \$8,500; value of whisky made per year, \$89,856.

Cosumnes and Michigan Bar Canal Co. – Have three miles of canal in this county. Cost, \$3,000; annual income, \$5,000.

Miners' Cosumnes and Deer Creek Water and Mining Co. – Have fourteen miles in this county. Original cost, \$80,000; annual income, \$8,000.

Natoma Water and Mining Co., (A. P. Catlin, Pres't). – Have six miles of main canal in this county, with thirty miles of main branches and several miles of smaller branches. Cost of canal, branches, reservoirs, aqueducts, etc., in this county, \$150,000; annual income for this county, \$100,000.

American River Water and Mining Co., (A. P. Catlin, Pres't). – Have twelve miles of canal in this county. Cost of reservoirs, aqueducts, canals, etc., in this county, \$75,000; annual income, \$75,000.

Yours, respectfully,

H. J. BIDLEMAN,
Assessor of Sacramento County.

SAN BERNARDINO COUNTY, Oct. 25th, 1855.

Hon S. H. MARLETTE, Surveyor-General:

Sir:

In reply to the requirements contained in your circular of the first of March last, I herewith transmit my report for the present year (1855) in the following style: First, all lands in the county, together with their qualities and locations, names of ranchos and the productions thereof, etc.

THE RANCHO SAN BERNARDINO.

Is situated at the base of the mountains in front of the Cajon Pass, and is surrounded on the south side by a range or chain of high hills. This rancho is situated in one of the finest valleys in the State, well watered with many fine streams, flowing from the mountains, forming the river called the Santa Anna, which flows into the Pacific south-west of San Bernardino City. This valley contains about forty leagues of land of fine, rich soil, well adapted for the growing of grain, vegetables and fruits; it is also a fine grazing country for all kinds of stock, and is well timbered. The mountains on the north are covered with fine pine, redwood, oak, etc. These mountains are quite rugged, which renders it difficult to get to the lumber, though the Mormons, the people of this valley, have built and made a road up and over the mountain to where they have an immense quantity of lumber, which they can never exhaust. They have five mills on the other slope of the mountain; one that saws by steam and the others by water power. They have also three other saw-mills in the valley, one for sawing, boring and morticing lumber for fencing. There is also a fine large flouring-mill in the valley which is able to manufacture large quantities of superfine flour, but their wheat crops failed so that they have but little to grind. This mill has but two run of stone. The saw-mills are not doing much at present on account of having but little water, except the steam mill, which cuts about 5,000 feet of lumber per day.

The Mormons, the people of the Rancho of San Bernardino, have almost entirely failed in raising wheat, and raised but little barley; their gardens, also, is an entire failure, with the exception of a few, which raised some good vegetables. The Mormons had but little grain in cultivation, about 4,000 acres; 3,000 in wheat and 1,000 in barley and oats. The wheat crop was so near an entire failure, that I do not believe they got their seed again. I have inquired of many farmers, and they tell me that the best they heard of was but twelve bushels per acre, and from that down to three bushels per acre; about one-half of the wheat crop was not cut. The barley and oats yielded about fifteen bushels per acre, making 15,000 bushels of barley and oats. I think the wheat crop could not average more than four bushels per acre, making but 12,000 bushels on the Rancho San Bernardino. The wheat is so very light and chaffy, that it will take four or five bushels to make one hundred pounds of flour.

The cause for this great failure in small grain in San Bernardino was from a mist or fog that appeared to come from the sea coast and settle on the wheat and barley; some places it appeared to rust but small portions, while in others the wheat was killed, but left bright and without any rust. I think that this fog or mist was of a salt nature.

The cause of this great failure in small grain in San Bernardino was from a mist or fog that appeared to come from the sea coast and settle on the wheat and barley; some places it appeared to rust but small portions, while in others the wheat was killed, but left bright and without any rust. I think that this fog or mist was of a salt nature.

The reason why the gardens failed was, that they did not plant as they should have done, and those planted properly did not attend to them as they should have done. These are the reasons why the gardens failed so much, and which I heard some of our citizens acknowledge a few days ago, and also seeing some who attended to their gardens raise very good vegetables.

The people of San Bernardino have set out or planted quite a fine vineyard of about 50,000 vines, which bore but few grapes the last two seasons. They have also set out quite a number of fruit trees of different kinds. Last year they raised some few peaches, but this year about five hundred bushels of fine peaches were raised on this rancho. The people of the City of San Bernardino are still building up the city, but appear to get on very slow; in fact, everything appears to progress in a slothful manner.

This rancho has not been surveyed or set off, though the U. S. Land Commissioners have confirmed eight leagues, and Lyman & Rich still claim the whole valley, which is about forty leagues of land. The citizens of San Bernardino rancho and city have quite a large number of American cows, and make considerable butter and cheese; they have made, during the past season, about 2,000 pounds of butter and 2,500 pounds of cheese. They also raise a large number of poultry which yield them a great quantity of eggs, and which amounts to quite a large sum in a year. The price of eggs has been as high as seventy-five cents per dozen, but are now at thirty cents; hens have been sold at twelve dollars per dozen, but are now selling at four dollars.

Amount of Grain and Fruit, Butter and Cheese raised and made on the Rancho of San Bernardino.

Barley, bushels.....	15,500
Wheat, “	12,000
Peaches, “	350
Butter, pounds.....	2,000
Cheese, “	2,500

THE RANCHO JARUPA.

This rancho is one of the finest in the county. It joins the San Bernardino on the south-west, and runs down the Santa Anna river on both sides a distance of thirty miles. It is a fine grazing country on both sides of the river, and is also well adapted for farming and growing all kinds of grain, fruit and vegetables. Seven leagues of said rancho have been confirmed by the U. S. Land Commissioners, but has not as yet been surveyed or set off. There will be a large portion that will belong to the government. About three leagues of this rancho have been sold to Louis Robidoux, and another portion of it was given by Bandina to some Mexicans to form a new settlement. The settlement consists of about twenty families, who have some fine farms, gardens and vineyards under cultivation. L. Robidoux has a fine farm and generally raises 1,000 bushels of wheat 1,000 of barley and about 400 of corn, together with an abundance of vegetables; this

season, however, his wheat crop was an entire failure, about half a crop of barley, about five hundred bushels, and three hundred bushels of corn, with some few vegetables. Don Louis has some few peach trees, about a dozen of which yielded a full crop of peaches; he has also a vineyard, but having removed the vines last spring they bore but few grapes last season. There is a flouring mill in the course of erection which will be ready to manufacture flour in about two months. He also raises a large quantity of stock of all kinds.

The Mexican settlement, of about twenty families, have fine small farms, gardens and vineyards, but have also failed to raise any wheat, but have raised considerable corn and vegetables of all kinds; they raise a great number of cattle and sheep. The Mexicans make no butter nor cheese worth mentioning.

Amount of Grain and Vegetables raised on Rancho Jarupa.

	Bushels.
Barley.....	500
Corn.....	2,300
Onions.....	1,000
Beans.....	500

THE RANCHO DEL CHINO.

This rancho is both fine and beautiful, having all the facilities for cultivating everything that we may wish to grow. It is also a very fine country for grazing stock of all kinds, and is bounded on the south side by most beautiful hills, which are covered with wild oats in their season. There is also a fine tar spring in these hills which is used for many purposes. The Mexicans cover their houses with this tar. The proprietor of this rancho, Col. J. Williams, does not farm on a large scale but raises a great number of horse, cattle, sheep and hogs. The Col. acknowledged to having eight and a half leagues of land, though I think there is about twice that amount, of first quality; it has not yet been set off. He cultivates nothing more than thirty-five acres of barley and a garden; the barley averages about twenty bushels per acre, making but seven hundred bushels raised on the Chino Rancho the past season. His garden was worth but little. The Col. has a fine orchard of the different fruits; his peach trees bore a very good crop this season.

Amount of Grain raised on the Rancho del Chino.

	Bushels.
Barley.....	500

THE RANCHO DE JUAPA.

This is a fine rancho, both for grazing and cultivation. It joins the Jarupa Rancho on the north, the Rancho de la Sierra on the south, the Rancho del Rincon on the south-west, and the Rancho del Chino on the west. It is situated on the Santa Anna River,

about thirty miles south-west of the City of San Bernardino. This rancho contains about 4,500 acres of land. Nothing has been cultivated this year, though there are 3,000 head of cattle grazing on the rancho. It belongs to the heirs of Thomas Yorba, deceased.

THE RANCHO DE LA SIERRA.

This rancho contains 4,500 acres, is good for grazing purposes, and small portions of it are well adapted for cultivation. It is owned by Don Bernardo Yorba, a Californian. There has been nothing cultivated the past season. There are some horses and corrals and two or three thousand head of cattle grazing.

THE RANCHO DEL RINCON.

This rancho is separated from the Rancho de la Sierra by the Santa Anna River, and joins the Rancho del Chino on the west, Los Angeles County on the south and the Rancho Jarupa on the north. It contains 4,500 acres of land, one-half of which is fine, rich soil and well adapted for cultivating anything one may wish to grow, though there was nothing raised on the rancho the past season worth mentioning. There are about 4,000 head of cattle grazing on the rancho at present. It is owned by Don Bernardo Yorba.

THE RANCHO TEMASCAL.

This rancho lies fifteen or twenty miles east of the Rancho de la Sierra, and in a south-east direction from the City of San Bernardino, a distance of thirty-five miles; it joins San Diego County on the east and Los Angeles on the south. This rancho is very fine for grazing, and there are about 1,000 acres of fine land fit for cultivation. There is a small vineyard and some fruit trees. There are three leagues of land belonging to this rancho, and there is a great number of horses and cattle grazing on it.

THE RANCHO CUCAMONGA.

This rancho lies about twenty-five miles west of the City of San Bernardino, on the road to Los Angeles. It is owned by Mr. L. V. Prudhomme, who says it consists of four leagues of land. It lies close up under the mountains, and is well watered by beautiful streams. There are two vineyards on this rancho having 13,000 vines, which yield on an average fifteen pounds per vine, making 202,500 pounds of grapes raised on this rancho the past season. There is also a fine small orchard of different fruits, peaches, pears, etc., which bore a large quantity of good fruit. There was nothing done in the farming line this season, no grain of any kind sowed or planted except some corn in the garden for using while green. It is one of the most beautiful ranchos in the county.

Amount of Fruit raised on the Rancho Cucamonga.

	Number.
Grapes, pounds.....	202,500

Peaches, bushels.....	300
Pears, “	200

SAN TEMOTEO RANCHO.

This rancho lies fifteen miles south-east of the City of San Bernardino, is claimed by Don Louis Robidoux, and contains one league of land. It is very good for farming and grazing purposes, but has not been confirmed as yet and is full of squatters, who have some six acres of wheat to each family, and about the same in barley, together with small fields of very fine corn. Their wheat did not rust or blast as in other places. I saw some tobacco growing on this rancho as fine as I ever saw in Kentucky, where I have raised thousands of pounds; the owner of this tobacco did not know anything about the raising of tobacco, and requested to give me some instructions how he should manage to cut and cure it; I did so, but have not learned how it turned out. There are ten families on this rancho, who have all fine gardens of vegetables growing in very good style; in fact, everything appeared to grow well and do well on this rancho.

THE MUSCUPEABE RANCHO.

This rancho lies west of the city of San Bernardino, is situated in the Cajon Pass, and is claimed by White, Crittenden & Co. It has not been surveyed or set off, and it is not known as yet how much there is in the claim, though I assessed it from the county records, and from the boundary lines laid down on the record I supposed that there was at least eight leagues of land in the rancho. This claim has a great quantity of good land both grazing and cultivation. There are some ten or twelve families that have squatted on the rancho with the calculation of its being government land; they have fine little farms and gardens in a flourishing condition.

Total Amount of Grain, Vegetables and Fruit, Butter and Cheese raised and made in the County of San Bernardino.

	Bushels.
Wheat.....	12,000
Barley.....	16,200
Corn.....	2,300
Peaches.....	650
Pears.....	200
Onions.....	1,000
Beans.....	500
Grapes, pounds.....	202,500

Total Amount of Stock of all kinds in the County of San Bernardino.

	Number.
Horses.....	1,356
Mules.....	191
Cattle.....	14,501

Sheep.....	7,304
Goats.....	106
Hogs.....	994

GOLD.

The mountains at or surrounding San Bernardino, wherever they have been examined, contain more or less gold. On the north side of the mountain from San Bernardino, and about sixty or seventy-five miles east of the city, there has been discovered, the past summer, some very beautiful specimens of the finest and purest gold I have ever seen. The gold is coarse, and about as large as grains of wheat, and some of it the size of grains of corn. I have also been informed by several persons that they have some pieces that weighed five or six dollars. This was discovered some time last June, on the side of the mountain near Bear Lake; from good authority, I learned that about one hundred ounces of this coarse gold had been taken out about thirty miles from this place, on the other side of the lake. There are some persons still hunting and digging, but on account of the scarcity of water there has been but little mining done thus far; they say that if there was plenty of water all could do well, and enable them to prospect the ground thoroughly; a great many intend to return when the rains set in. I am also informed that there are ranges of quartz leads running about twenty-five miles in length, and from one to four miles apart. It is supposed that there will be found some very rich claims when this range has been properly examined. Those that have been in that section, say that in every place they prospected they have invariably found the "color." Gold has been found in every ravine along the mountain, from San Bernardino to the Cucamonga Rancho, which is a distance of thirty miles; it has also been discovered on the Temascal Rancho. From all the prospects that appear, I have no doubt but this will become one of the greatest mining regions in the State.

THE SAN GORGONA PASS.

This is a large and extensive tract of land, about forty or fifty leagues, lying thirty or forty miles in a south-east direction from the City of San Bernardino. There are some few settlers there now, but others are going and settling. The fog or mist that was so destructive to the small grain on the San Bernardino Rancho, does not make its appearance here. Nine leagues of this pass has been claimed by Powel Weaver, a grant given him by the Mexican Government, but for the last two years has not paid the taxes on it. It is well adapted for grazing and farming purposes.

THE MOHAVE RIVER.

This river is on the other side of the mountains, about fifty miles north of the San Bernardino City. I am told there is a fine country for farming and grazing purposes, which is now being surveyed by Cols. Washington, Norris and Washburn who were employed to survey that country, and will soon be completed.

I have given to you, in the above Report, all the information I could obtain in relation to the condition and resources of this county. There are many things set forth in your circular that are not here, such as bridge companies, toll-bridges, canals,

turnpikes, railroads, electro-magnetic telegraphs, Artesian wells, etc.; also, flax, hemp, sugar, rice, cotton, beeswax, honey, etc. All the articles grown and raised here are mentioned in the above report. I have had nothing worth reporting to you quarterly, but have given you all that I have been able to learn or find out for the present year in this report.

Very respectfully,
Your ob't Servant,

V. JOHNSON HERRING,
Assessor San Bernardino County.

OFFICE OF THE COUNTY ASSESSOR,
San Diego County, September 30th, 1855.

Hon S. H. MARLETTE, Surveyor-General:

Sir:

In accordance with the requirements of your circular of March first, which was received by me the latter part of July, I have to make the following report:

GRAIN.

	Bushels.
Barley.....	15,000
Wheat.....	3,000
Corn.....	15,000

LIVE STOCK.

	Number.
Cattle, all classes.....	18,000
Horses.....	650
Mules.....	300
Work Oxen.....	300
Mares and Colts (wild).....	3,000
Sheep.....	3,200
Hogs.....	2,000

About three hundred tons of hay.

The lands of this county, with few exceptions, are generally adapted to grazing purposes. There are a few intervening valleys of excellent agricultural land, which, so far as cultivated, have produced equal to anything in the State. The low price which agricultural products now command, and the distance of this county from the principal

markets, have had a tendency to retard agricultural pursuits, and much land that might be advantageously cultivated, is now left for the free use of stock.

The interior or mountainous district of the county is generally well timbered, chiefly oak. In the neighborhood of San Isabel are fine pineries, sufficient to supply, for many years, all the timber that may be required for building or for purposes of internal improvements.

There are but few vineyards within this county that are at present properly cultivated. Upon many ranchos there are the remains of large vineyards that have been destroyed by cattle or permitted to go to ruin. This negligence of the vine is unaccountable. Our soil and climate here are peculiarly adapted to the cultivation of the grape, and the few that are cultivated have not their superior in size or flavor.

The annual products of the diary, cultivation of vegetables, fruit trees, etc., are very small, not sufficient for home consumption.

Your circular having reached me so late, the above report is but an approximation made up from all the facts that came within my reach, but it can be relied upon as being *very near* correct.

I am,
Very respectfully,
Your obed't servant,

E. B. PENDLETON
Assessor San Diego County.

SAN JOAQUIN COUNTY, Aug. 14th, 1855.

Hon S. H. MARLETTE, Surveyor-General:

Sir:

In compliance with an Act passed 1850, regulating the duties of County Assessor in reference to making an annual report to the Surveyor-General, the undersigned begs leave to report, that the whole number of acres of barley, wheat, etc., require to be reported upon by the Assessor is as follows:

GRAIN, ETC.

	Acres.
Barley.....	11,549
Wheat.....	10,197
Oats.....	1,988
Potatoes.....	27
Corn.....	118
Millet.....	15
Grass.....	2,000

LIVE STOCK.

	Number.
Neat Cattle.....	16,326
Horses.....	3,511
Mules.....	1,146
Asses.....	30
Sheep.....	4,075
Goats.....	296
Hogs.....	20,298

MILLS, ETC.

	Number.
Flour Mills.....	7
Run of Stone.....	21
Saw Mills.....	3
Acres of Land under Fence and Improvements.....	61,788
Acres of Grapes under cultivation.....	12

Public Schools organized, fifteen.

The foregoing statement is a reliable one, so far as my means of knowing is concerned. In regard to the statement of the number of hogs, I think there must be as many as 30,000, but cannot say this by any authority as a great many people cannot tell how many things by any authority as a great many people cannot tell how many they have got, from the fact of their running wild in the tules. All the other statements are correct and authentic.

In this county, the present year, I am satisfied that the wheat crop has far less smut than the preceding year. I find no smut among the club wheat, and believe that were our farmers to sow that kind of seed, they would, in great measure, remedy that difficulty in wheat growing. I thin, and can state, too, from my own experience, that were our farmers to change their seed and not sow the same kind of seed in the ground for a succession of years, that their crops would be far better, especially wheat. The average number of bushels this year to the acre of wheat, will be about nineteen and a half; barley, thirty; oats, twenty-four; corn, thirty-five (that is, or ears); potatoes, fifty; of pease and beans, there are none raised worth mentioning. There is no fruit of any consequence raised as yet; however, from what information I can gather, there are some 3,000 peach and 1,000 apple trees growing, which are in a thrifty condition. People are waking to a very lively interest in fruit raising. There are about one hundred pear trees in a flourishing condition, some eighteen or twenty of which are beginning to bear fruit.

It is found, from actual experiment, that the grape can be successfully cultivated in all parts of the county. It is impossible to ascertain how many pounds are raised this year, since they are not generally gathered.

At the present time there is no further suggestion to be offered, but I will make another report on the first of October, when I return a supplementary assessment.

Yours, respectfully,

S. A. HURLBURT,
Assessor San Joaquin County.

SAN LUIS OBISPO, June 16th, 1855.

Hon S. H. MARLETTE, Surveyor-General:

Sir:

In compliance with your circular to the County Assessors, I herewith transmit to you the following in relation to same as regards this county:

	Acres.
Grazing.....	250,000
Agricultural Land.....	30,000
Wheat Land under cultivation.....	300
Oak, pine and red wood, but very sparing.	

GRAIN, ETC.

	Bushels.
Wheat.....	6,000
Corn.....	2,000
Barley.....	3,000
Beans.....	2,500
Potatoes.....	5,000

	Pounds.
Wool.....	4,000
Butter.....	2,000
Cheese.....	2,000

LIVE STOCK.

	Number.
Horses.....	3,000
Mules.....	200
Asses.....	50
Oxen.....	200
Milch Cows.....	1,000

Sheep.....	2,500
Beef Cattle.....	40,000

Twenty-five acres of fruit trees. No hay, flax, etc.

The number of slaughtered animals this year amounted to \$15,000. No internal improvements.

There are two grain and one saw mill, two of which are of water and one of horse power. They have just commenced and I can give no returns.

Our boundary line at present is very conflicting on one side, being the lines between two ranchos, on a plain, and without being marked by any object. Our line should be extended to the old district line and the Santa Inez River, which would give our county a water-course on the northern and southern boundaries. Here were our county lines before the American laws were put into motion, but on the commencement of the collection of taxes, every county desired to augment her revenue by taxing as large a body as possible; and thus, with the encroachments of Monterey County on the north, and Santa Barbara on the south, we have become so reduced as not to be able to raise sufficient revenue for county purposes, while from the great distance to each of the above county seats it is impossible for us to be annexed to either.

Monterey County is now over one hundred and twenty miles in length, and Santa Barbara one hundred and thirty, while San Luis Obispo is only sixty-five miles in length, or about one-half of either of the above. I would beg leave to call your attention to the above.

We have as yet no vineyards. Our statistics of the past year, according to the assessment roll just completed, show no variation from the present of any consequence.

Respectfully,

S. A. POLLARD,
Deputy Assessor San Luis Obispo County.

COUNTY ASSESSOR'S OFFICE,
San Jose, Sept. 17, 1855.

Hon S. H. MARLETTE, Surveyor-General:

Sir:

In compliance with the duties of my office in connection with that of the office of the Surveyor-General, I most respectfully submit the following report of the statistics of the County of Santa Clara:

ACRES OF LAND INCLOSED.

The number of acres of land under fence in this county amounts to 50,000, 25,975 acres of which is in the cultivation of the following products:

	No. Acres.	Bushels.
Wheat.....	20,000	240,000
Barley.....	3,000	75,000
Oats.....	2,000	66,000
Corn.....	300	6,000
Rye.....	575	1,875
Buckwheat.....	20	400
Potatoes.....	300	15,000

Beans. – Some two hundred acres have been planted, but the most part have perished from the continued dry and hot weather in the months of May and June.

Onions. – The number of acres planted amounts to one hundred, yielding about 2,500 bushels.

Vegetables. – Pumpkins, cabbage, carrots, beets, turnips, and all kinds of vegetables are produced in abundance for home consumption.

Fruit Trees. – There are about 12,000 fruit trees set out in the county, comprising many varieties of apple, pear, peach, cherries, plum, apricot, etc.; about one-half of the number have commenced bearing. In addition to the above number of trees we have some 1,500 pear trees, mostly of the mission orchards, that produce annually an abundant harvest.

Vineyards. – In addition to the orchards we have a number of very fine vineyards, numbering in the aggregate about 30,000 vines; probably one-half of the number are beginning to yield fruit.

Hay. – Acres of hay cut, 4,670; producing to the acre, one tun; making in the aggregate, 4,670 tuns.

Cattle. – Number of American cows, 4,050; do. oxen, 1,621; do. yearlings, 2,163; do. calves, 3,165. Spanish cattle, 9,638. Total number cattle, 20,637.

Sheep. – There are 10,000.

Goats. – Nine hundred and twenty-five.

Hogs. – The number of hogs cannot be correctly ascertained. Suppose number, 15,000.

Horses. – Number of gentle horses American and Spanish, is 2,900. Wild California horses, 1,750. Total number of horses, 5,650. Mules, 433; Jacks and Jennies, seventy-three.

Artesian Wells. – Number Artesian wells, sixty-three; depth, forty to three hundred feet.

Grist Mills. – Flouring mills we have seven, with seventeen run of stone; capable of making per day five hundred barrels of flour.

Saw Mills. – Ten, principally water mills, situated in the Sierra de Santa Cruz. Lumber – principally red-wood and fir; an abundance of which there is in the aforesaid mountains.

Mines. – The New Almaden Quicksilver Mines, situate in the Sierra de Santa Cruz about twelve miles south of the City of San Jose, are the richest that have ever been discovered in the world – produce annually about 22,000 bottles; weighing per bottle, seventy-five pounds.

Distilleries. – One.

Tanneries. – Three.

Breweries. – Two.

Magnetic Telegraphs. – California Telegraph Company have thirty miles of wire stretched; cost, \$40,000.

Schools. – The number of common schools organized in the county, seventeen; scholars attending common schools daily, six hundred and ten. Private schools, two; scholars, sixty-three. Seminaries, three; pupils, one hundred and sixty. Colleges, two; number of students, three hundred. Universities, one; students, eighty-five. Aggregate number of pupils attending schools, 1,218.

Military. – Number liable to do military service, 1,532.

Most respectfully,
Your obedient servant,

JAMES H. MORGAN,
Assessor San Clara County.

SANTA CRUZ, October 1, 1855.

Hon S. H. MARLETTE, Surveyor-General:

Dear Sir:

In compliance with your request by circular, I transmit the following report. The first, second, third and fourth portions of your circular, I would refer to the County Surveyor of this county:

STOCK.

	Number.
American Oxen.....	400
“ Cows.....	500
“ Beef and Stock Cattle.....	350
California Oxen.....	300
“ Cows.....	500
“ Beef and Stock Cattle.....	4,850
American Horses.....	175
Mules.....	175
Sheep.....	2,200
Hogs.....	3,400
Goats.....	40
California Horses.....	1,200

GRAIN, ETC.

Acres of Wheat.....	4,000
" Harvested.....	1,500
" Not harvested – spoiled by rust and smut.....	2,500

In wheat sown in situations where there was a free circulation of air through it, the rust is not so bad. I believe the cause of the rust is this: The heavy fogs or dews prevailing during the night being followed by very warm days. In the upper portions of the county, and where cold winds are prevalent, the grain is good. The average yield of wheat throughout the county is about twenty bushels per acre.

	Acres.
Oats.....	1,200
Harvested.....	700

Average yield throughout the county, twenty-eight bushels per acre. That not harvested, in same condition as unharvested wheat.

	Bushels.	Acres.
Barley, yield per acre.....	30	1,800
Beans, ".....	40	250
Potatoes, ".....	300	500
Onions, ".....		45
Buckwheat, ".....	30	50
Cabbages, ".....		8
Pease, ".....		6
Corn, ".....		90
Gardens.....		50

FRUIT TREES.

Apple Trees from one to three years old.....	3,000
Pear " old.....	51
" " from one to three years old.....	300
" " " " " ".....	300
Grape-Vines " four ".....	7,000
Of Apricot, Cherry, Plum, Quince and Nectarines.....	200

Eggs, 60,000 dozen. Butter, 2,000 pounds.

Total number of barrels of lime burnt and shipped, 30,609, of which Messrs. Davis & Jordan burned 21,409. It is of two qualities, a fine grained, gray colored, and a white crystallized. There are inexhaustible beds of it within one mile of the town of Santa Cruz. There has been found a quantity of auriferous quartz lying in masses about three miles from the town. The gold can be plainly seen in small particles all over the quartz. In the placers there have been washed out since last March, about five

thousand dollars. There are now about twenty men at work in the diggings, who average two dollars per day. The gold is found in most of the ravines and in some places on the hills, on the surface as well as next to the bed rock. The extent of the gold region is about ten miles by four miles; the best is about three miles from the town. There are also large quantities of chromic and sulphurate of iron in the mountains.

About one-third of the county is adapted to tillage and grazing, the balance being barren hills, and heavy red wood and pine timber lands. There is a wharf at this place, owned by Messrs. Davis & Jordan, which answers a very good purpose for landing and shipping, except in southerly storms. There are four flouring mills in the county, with six run of stone, grinding sixty barrels per day to the mill. There are eleven saw mills, eight water and three steam, cutting each about 1,200 feet of lumber per day. There is one furnace, owned by E. Anthony & Co., with a steam engine attached, for machine purposes. There are five shops where wagons are made, six blacksmith shops, and dry goods and grocery stores.

On account of the imperfect titles by which land is held, the improvements of farms is not great. Total amount of taxable property, \$1,000,000.

The above is to the best of my knowledge a correct report.

Very respectfully,
Your obedient servant,

JOHN F. PINKHAM,
Assessor Santa Cruz County.

OFFICE COUNTY ASSESSOR,
Shasta, -----,

Hon S. H. MARLETTE, Surveyor-General:

Sir:

In compliance with your Circular, and in conformity with an Act passed on the 17th of April, 1851, I transmit the following information:

There was raised in this county in 1854 –

	Acres.	Bushels.
Wheat.....	1,207	27,509
Barley.....	2,862	58,836
Corn.....	127	2,663
Oats.....	76	3,622
Potatoes.....	96	7,661
	<hr/>	
Totals.....	4,368	101,391

And in 1855 there was raised –

	Acres.	Bushels.
Wheat.....	2,898	65,378
Barley.....	2,995	74,885
Corn.....	203	5,143
Oats.....	239	4,956
Potatoes.....	142	14,780
Totals.....	6,477	165,142
Increase over last year in cultivation, acres.....		2,109
“ “ “ bushels.....		63,751
Hay cut, tons.....		1,763

Cotton, staple short but very fine; yield, two hundred pounds, ginned, to half acre.

FRUIT TREES.

	Number.
Apricot.....	84
Apple.....	1,876
Peach.....	3,247
Pear.....	266
Plum.....	63
Cherry.....	35
Figs.....	36
Almonds.....	26
Quince.....	1,062
Olive.....	3
Grape-Vines, mostly two years old.....	5,447

The ages of these trees are from one to three years old.

LIVE STOCK.

Horses.....	790
Mules.....	1,097
Jacks.....	35
Cows.....	837
Calves.....	1,023
Oxen.....	1,086
Sheep.....	175
Goats.....	15
Swine.....	3,717

Value of poultry, \$5,680. Value of animals slaughtered, \$97,000.

MILLS.

Twelve saw mills – original cost, \$58,800; expense of running per day, \$266; amount of lumber sawed per day, 24,000 feet; value, \$45 per thousand.

Two steam grist mills – original cost, \$85,000; engines, one hundred horse power; six run of stone; number of barrels per month, 2,044; expense of running per month, \$7,000.

Two quartz mills, cost \$40,000; but one at present in operation. Tuns of quartz crushed per month, one hundred and eighty; cost of running per month, \$1,680; yield per month, \$5,400.

We have one Artesian well nearly completed; at present it is ninety-three and a half feet deep, fifty-two feet water, size of bore six inches. The different stratas gone through are as follows: red clay, two feet; gravelly boulders intermixed with red clay, seventeen feet; white clay, three feet; hard sandstone, three feet; white clay, five feet; alternate layers of soft sandstone and clay, fifteen feet; white clay, two and half feet; hard sandstone, two and a half feet; white clay, fourteen feet; washed sand, one and a half feet; gravel, two feet.

The above is as correct a statement of the statistics of our county as I have been able, by diligent inquiry, to obtain.

I remain, respectfully,
Your obedient servant,

WM. S. HUGHES,
Assessor of Shasta County.

DOWNIEVILLE, SIERRA COUNTY,
October 27th, 1855.

Hon S. H. MARLETTE, Surveyor-General:

Sir:

In compliance with your instructions, I beg leave to make the following report:

There are three hundred and nineteen acres of land under cultivation in this county, which, you will find by comparing with my report of last year, falls short of the number of acres under cultivation at that time. The reason of this is, that a portion of this county, known as Sierra Valley, was included in my report of last year, and this year it is claimed to be a portion of Plumas County, consequently it has been left out of my report altogether this year.

The County Surveyor has, probably, reported to you the undefined condition of the lines of this county on the north, west and south. The intersects of this county, and the inhabitants of the districts in dispute, require that these lines should be properly defined as soon as possible. The northern line, dividing this and Plumas County, is not sufficiently defined in the Statutes to enable a Surveyor to run it, for the reason that the

Statute calls for a line that does not exist. It calls for a line running from the Lexington House in a northerly direction, following out said ridge, (the ridge dividing the waters of the Yuba and Feather rivers,) thence easterly to the State line. Now, the ridge here spoken of runs in a south-easterly direction, and if followed out, it would run the line to the north-east corner of Nevada County, cutting in between this county and the State line.

The principal agricultural productions of this county are potatoes, turnips, carrots, beets, radishes, cabbages, melons and squashes. The soil, when properly irrigated, produces Indian corn, wheat, oats and barley, but these are not cultivated to any extent, owing to the lack of facilities for irrigation.

There are about three hundred peach trees in this county, some of which commenced bearing this year for the first time. I have seen specimens of the fruit, equal in size and flavor, not surpassed by any grown in any part of the State.

There are also several hundred apple and pear trees growing, which are in a very thrifty condition, but none of them have commenced bearing yet. The climate and soil seems remarkably well adapted to the culture of these fruits.

Grape vines, also, grow well, but none having commenced bearing, I am not prepared to say what quality they will yield.

This being entirely a mining county, its agricultural resources have been neglected, but in all cases where this branch of industry has been properly applied, it has yielded a rich harvest.

	Number.
Mules.....	948
Horses.....	89
Cows.....	214
Hogs.....	1,571
Jacks and Jennies.....	27
Beef Cattle.....	162
Sheep.....	314
Calves.....	46
Goats.....	13

Of timber, there is found in this county, in great abundance, the pine, fir, cedar, hemlock, yew, live oak, black oak, alder and manzanita.

There are now in operation twenty-five saw mills, valued at \$93,000. The amount of lumber cut within last year, I have no means of ascertaining.

There are seventy-eight ditches and flumes in the county, the aggregate value of which is \$389,000. There are, in addition to these, about fifty more in course of construction, that will be completed within two years, the cost of which will not be less than \$1,500,000.

The assessed value of taxable property in this county, this year, is \$1,484,560.

I know of no lands in this county belonging to the State.

All the land in this county is mineral land. The mineral produced is principally gold, but I have no means of making anything near an accurate estimate of the amount

produced within the last year. For a description of the localities on which gold is found, I refer you to the whole county.

There is but one quartz mill in this county; value, \$8,000. No grist mills.

There are two toll bridges in this county. No ferries.

My report is not as full as it should be, but I have used all the means at my disposal to procure the proper statistics, but in the mining counties the population is so transient, business of all kinds so unsettled, it is impossible to gather correct statistics.

Of the amount of live stock reported above, this only includes the amount on hand at the time I assessed the county. There are, probably, from 1,500 to 2,000 beef cattle butchered annually in this county, but they are driven in small lots from the lower counties, and butchered as soon as they arrive; also, large numbers of sheep and hogs are driven into this county and butchered, and no account is made of them.

As miners are not accustomed to keeping an account of the amount of gold produced in a year, and farmers do not keep any reliable account of the amount of agricultural productions, it is impossible to obtain reliable statistics.

I have delayed my report several weeks, trying to get a correct estimate from bankers and merchants, of the amount of gold produced during the last year, but have failed to obtain one that would vouch for as correct.

Very respectfully,

FRANCIS M. PROCTOR,
Assessor Sierra County.

BENICIA, Oct. 24, 1855.

Hon S. H. MARLETTE, Surveyor-General:

Dear Sir:

In obedience to your instructions, I beg leave to make the following report:

The are of the county is about nine hundred square miles; 110,000 acres of land subject to overflow; 155,000 acres mountain and hill land; 310,000 acres valley land; 175,000 acres suitable for cultivation, and 135,000 acres suitable for grazing purposes.

There are about fifty-five miles of boundary that should be surveyed as soon as possible, forty miles between Napa and Solano, and fifteen miles between Yolo and Solano. The whole number of acres in cultivation is 16,707; in wheat 7,264 acres; barley, 5,202 acres; oats, 721 acres; Indian corn, 724 acres; broom corn, 150 acres. Horses, 2,945; mules, 278; cattle, 22,179; hogs, 16,415; sheep, 14,279; goats, 162. Grape vines, 56,178; peach trees, 7,039; apple trees, 1,087; pear trees, 756; apricots, 560; figs, 224; quince, 147; olive trees, 1,000; locust trees, 2,000; 4,575 tuns of hay.

There are three steam grist mills, but I could not ascertain the amount of flour manufactured during the year, probably 30,000 bbls.

There have been two Artesian wells commenced to be bored in this county, but neither of them have been completed as yet. The one at Suisun City has been bored to the depth of three hundred or four hundred feet, the other at the residence of Mr. A. P. Jackson, has been bored about one hundred and thirty or one hundred and forty feet, and contains good water, but does not overflow. I have not been able to get a more full description of these wells.

H. B. AMMONS,
Assessor, Solano County.

SANTA ROSA, Sonoma County
October 1, 1855.

Hon S. H. MARLETTE, Surveyor-General:

Sir:

The information desired by you, as set forth in your circular to the County Assessors of March 1, 1855, I have endeavored to collect as faithfully as possible, and in conformity with section nine of an Act of the Legislature passed April 17, 1850. The result of my labors is respectfully submitted in the following report:

LAND INCLOSED.

The quantity of land inclosed in this and Mendocino Counties amounts to 37,052 acres, about 22,400 acres of which is in the cultivation of the following products:

The number of acres sown in wheat is 12,233, of which amount 3,500 acres only (mostly from Chili and Oregon seed,) is good, or but very slightly affected with rust, and will average twenty-two bushels to the acre, making a total of 77,000 bushels. The remainder, or 8,733 acres, (club-head seed,) was entirely destroyed, or nearly so, by the rust, and but a small portion was ever harvested. Some of our farmers are of the opinion that the Australia wheat is the most suitable for our climate; it is, however, very liable to become smutty, which can be remedied by soaking the seed in a solution of blue vitriol, for ten or twelve hours before sowing. The experiment has been tried with perfect success.

BARLEY.

The number of acres sown is 1,561, and will average thirty-two bushels per acre, making 49,952 bushels; in some localities the cheat has destroyed some few fields. With this exception the grain is good.

OATS.

Number of acres sown, 3,268. Average yield, thirty bushels per acres, which gives a total of 98,040 bushels. This grain, also in the immediate vicinity of the coast, was slightly affected with rust.

CORN.

The number of acres planted in corn is seven hundred and fourteen, mostly in Russian River and Dr Creek Valleys, where it seems to flourish well. The crop will average forty bushels per acre; total, 28,560 bushels.

RYE.

Of this grain there was only a small quantity sown, ten or twelve acres, merely an experiment.

BUCKWHEAT.

Number of acres, ninety-nine; seems well adapted to our soil, and will yield, say twenty-two bushels per acre, giving a total of 2,778 bushels.

PEASE.

Number of acres, one hundred and fifty-six. Average yield, thirty bushels per acre. Total, 4,680 bushels, mostly raised for hog feed.

BEANS.

Number of acres, one hundred and seventy-seven. Average, twelve bushels per acre, making 2,124 bushels.

IRISH POTATOES.

The quantity planted of this product is 1,693 acres, against 2,600 last year; will not yield more than forty sacks per acre, making 67,720 sacks of one hundred and twenty pounds each. Of this amount, at least one-half will be destroyed, or rendered unfit for market by the worms, which made their appearance about the first of September.

GARDEN VEGETABLES.

Pumpkins, melons, turnips, beets, onions, etc., and almost every kind of garden vegetables, are raised in abundance. I cannot give the quantities, as nobody pretends to keep any account of them.

FRUIT TREES.

There are 6,730 fruit trees, set out mostly young, from one to three years old, comprising many varieties of apple, pear, peach, plum, cherry, fig, quince, apricot, etc. About one-third of the number have commenced bearing, and next year much fruit is anticipated.

VINEYARDS.

We have a number of fine vineyards, numbering in the aggregate some 24,800 vines, many of which are loaded with grapes. The estimated quantity gathered last year was fifty tuns. The present season it will be more than doubted.

CATTLE, HORSES, ETC.

	Number.
American Cattle, Milch Cows.....	3,350
Dry Cows.....	2,575
Calves.....	5,750
Work Oxen.....	2,771
Beef Cattle.....	1,922
Yearlings.....	4,294
California Cattle.....	<u>3,583</u>
Total number of cattle, (American and California)...	26,250
Gentle Horses, American and Spanish.....	3,708
Wild Californian Horses.....	<u>1,250</u>
Total.....	4,958
Mules.....	323
Hogs.....	19,459
Sheep.....	7,065
Goats.....	75
Jacks.....	5
Hay, number of tuns cut.....	800
Wool, mostly from Spanish sheep, pounds.....	14,500

BUTTER, CHEESE, ETC.

In regard to the articles of butter, cheese, eggs, chickens, etc., I found it impossible to collect any correct information, as but few, if any farmers keep an account of the amount they sell, or the average price of the same. The dairy business, however, is carried on to some considerable extent, as can be seen by the annexed statement of

the quantity and value of these articles received by one firm in San Francisco from the town of Petaluma, during the month of August.

	Pounds.	Value.
Butter.....	12,767 at 72 c.	\$9,192 24
Cheese.....	2,787 at 19 ¼ c.	537 72
Eggs.....	3,460 dozen at 61 c.	2,110 60
Chickens.....	1,437 at 63 c.	<u>905 31</u>
Total Value.....		\$12,745 87

In addition to the above, there are considerable quantities shipped by other parties in Petaluma, Sonoma and Bodega, sufficient to swell the amount to \$20,000 per month, or \$240,000 per annum.

There are three steam saw mills, and five water mills, capable of sawing 110,000 feet of lumber every twenty-four hours. The principal kind manufactured is red-wood. One steam grist mill, with two run of stone, capable of manufacturing seventy-five barrels of flour every twenty-four hours; the original cost, about \$6,500; and five water mills, capacity one hundred barrels every twenty-four hours.

RECAPITULATION.

	Acres.	Average Yield.	Bushels.
Land Inclosed.....	37,052		
Lands in cultivation.....	22,400		
Wheat.....	3,500	22	77,000
Barley.....	1,561	32	49,952
Oats.....	3,268	30	98,040
Indian Corn.....	714	40	28,560
Rye.....	10		
Buckwheat.....	99	22	2,178
Pease.....	156	30	4,680
Beans.....	177	12	2,124

Potatoes, 1,693. Number of sacks sound, twenty. Total sacks, 33,860.

CATTLE.

	Number.
Milch Cows.....	5,350
Dry Cows.....	2,575
Yearlings.....	4,294
Calves.....	5,750
Work Oxen.....	2,771
Beef Cattle.....	1,922
California Cattle.....	<u>3,583</u>
Total.....	26,250
Horses (gentle,).....	3,708
Horses (wild,).....	1,250
Mules.....	323
Jacks.....	5
Sheep.....	7,065
Goats.....	75
Hogs.....	19,459
Wool (pounds,).....	14,500
Hay, tuns cut.....	800

Steam saw mills, three. Water saw mills, five. Amount of lumber sawed every twenty-four hours, 110,000 feet.

Steam grist mills, one. Water grist mills, five. Amount of flour ground in twenty-four hours, one hundred barrels.

Very respectfully,
Your ob't servant,

SMITH D. TOWNE,
County Assessor.

STANISLAUS COUNTY, Nov. 10th, 1855.

Hon S. H. MARLETTE, Surveyor-General:

Sir:

In compliance with your circular, I will state that the amount of land under cultivation in this county, is 6,982 acres.

	Acres.
Wheat.....	3,684
Barley.....	2,231
Oats.....	420
Corn.....	147
Gardens.....	500

Fifteen bushels of wheat per acre; total amount of wheat, 55,620 bushels.
 Twenty bushels of barley per acre; total amount of barley, 44,620 bushels.
 Amount of hay, 1,500 tuns.

LIVE STOCK.

	Number.
Cattle.....	9,937
Horses.....	1,210
Sheep.....	3,747
Hogs.....	1,416
Goats.....	100

There are eight hundred and thirty-seven fruit trees. Also, four hundred and forty-nine grape-vines.

Number of men at work in mines, two hundred and fifty.

Amount of gold produced per annum, \$225,000.

One grist mill, (one run stone.) Also, one saw mill.

Number of ferries, fifteen.

The above is a true statement, according to the information acquired by me while assessing the county.

Your obedient servant,

E. B. BEARD,
 Assessor Stanislaus County.

 NICOLAUS, SUTTER COUNTY,
 October 31st, 1855.

Hon S. H. MARLETTE, Surveyor-General:

Sir:

I herewith send you the required report, and which is as follow, to wit:

The number of acres of land in this county is unknown. The overflowed land, and the land subject to overflow, lies between the Feather and Sacramento Rivers.

Timber in this county consists of oak, of an inferior quality, with the exception of that on the Sacramento River.

LIVE STOCK.

	Number.
Cattle.....	15,180
Horses.....	1,200
Mules.....	607
Hogs.....	7,235
Sheep.....	2,251

AGRICULTURAL PRODUCTS.

	Bushels.
Barley.....	314,080
Wheat.....	15,800
Oats.....	1,207
Potatoes.....	21,100

	Pounds.
Cabbages.....	1,000,000
Onions.....	28,195
Butter.....	7,180
Cheese.....	3,000

The above and foregoing is as near correct as can be ascertained,

Respectfully yours,

G. W. DURKEE,
Assessor Sutter County.

WEAVERVILLE, Sept. 21st, 1855.

Hon S. H. MARLETTE, Surveyor-General:

Sir:

Inclosed I send you the statistical reports (of inquiries you wished in your circulars) in this county. It was quite difficult obtaining the information as complete as I would like, but such as I send is correct – although I would like to have made a more full report:

Statistics of Trinity County for 1855.

Agricultural lands, capable of cultivation, 10,755 acres.
 Swamps and overflowed lands – swamp, seventy-five acres; overflowed, one hundred and eighty acres.
 In cultivation, 2,900 acres.
 Adapted to grazing, 104,827 acres.
 Mining and gold in every portion of the county.
 Claims located, 24,849.
 Different kinds of timber – pine, four varieties; oak, three varieties; ash, wild cherry, alder, madronia, yew, cedar, birch, balm gilead, manzanita, soft maple, and willow.

GRAIN, ETC.

	Acres.
Wheat.....	848 ³ / ₄
Barley.....	655 ¹ / ₄
Oats.....	125 ³ / ₄
Corn.....	64 ³ / ₄
Pease.....	3
Beans.....	6
Potatoes.....	360
Turnips.....	20
Onions.....	23
Melons.....	38
Cabbages.....	35
Pumpkins.....	5
Beets.....	4
Carrots.....	7
Clover and timothy.....	63

FRUIT.

Number of fruit trees, 2,791, Kind of fruit –	
Apple.....	1,264
Pear.....	465
Peach.....	762
Plum.....	200
Cherry.....	100

LIVE STOCK.

	Number.
Horses.....	125
Mules.....	713
Jacks and Jennies.....	75
Milch Cows.....	200
Oxen.....	125
Calves.....	83

Beeves slaughtered, average, per year, 3,000.

INCORPORATED FERRIES.

Whole number, thirteen; cost \$7,300; income per year, \$3,950. Bridges, three, (two not completed); one cost \$7,000; income, per year, \$4,000.

SAW MILLS, ETC.

Whole number of saw mills, fifteen; cost \$63,074; amount of lumber sawed yearly, 2,695,000 feet; expenses running per year, \$90,000; value of lumber, \$188,650.

There is also one grist mill; cost \$5,000.

Gold dust bought, yearly, 78,000 ounces. Platinum, some little.

Number of miles of ditches and flumes, for mining purposes, two hundred and forty-seven and a half.

The whole of the county boundaries are unsurveyed.

Respectfully yours,

D. W. POTTER,
Assessor Trinity County.

VISALIA, August 14, 1855.

Hon S. H. MARLETTE, Surveyor-General:

Sir:

In answer to your communication, dated Sacramento, June 1st, 1855, and other similar communications received from you, I would respectfully submit the following report from Tulare County:

Tulare County contains about 1,600 square miles of agricultural land, of as good an average quality as can be found in any other part of this State.

Amount cultivated land, 2,750 acres.

	Acres.
Wheat.....	1,500
Barley.....	1,000
Corn.....	200
Oats.....	30
Potatoes and Vegetables.....	20
	Number.
Horses.....	487
American Cows.....	856
Other Cattle.....	2,778
Goats.....	1,000
Sheep.....	856
Hogs.....	1,397

Amount of taxable property, \$438,000.

There are now about two hundred and fifty miners on and in this vicinity of Kern River. A large proportion are turning their attention to quartz mining, and it is the opinion of those best acquainted with the branch of mining, that the quartz leads in that vicinity exceed, in number and richness or ore, those to be found in the same extent of territory in any portion of the State. I have examined them myself, and fully agree in the above statement. Some of the placer diggings also pay well.

In relation to county boundaries, I would say, there is a portion of the southern boundary of this county, (about fifty miles in extent,) which is very indefinite from the fact, that many of the ranchos, the boundary lines of which are made the boundary between this and Los Angeles County, are mentioned in the Statute by names by which they are not at present known. Consequently, a dispute has arisen between this and Los Angeles County, with regard to a large extent of territory, including Fort Tejon, Frenche's Rancho, and other territory. Assessments have been made by both counties in the above disputed territory, and some difficulty is likely to ensue in regard to collection of taxes. The amount necessary to run this line would not, probably, exceed \$1,000; and it is an object of the greatest importance, both to Los Angeles and Tulare Counties, that this line should be run as soon as possible. The summit of the Coast Range would probably be the best natural line between the two counties, and seems intended by nature for some such purpose. I would particularly call your attention to this boundary question.

There are some other matters which perhaps ought to be mentioned in this report, but which I have not the necessary statistical information to present properly. I would therefore respectfully submit the above.

Your obedient servant.

J. B. HATCH,
Assessor, Tulare County.

COUNTY OF YOLO, August 5, 1855.

Hon S. H. MARLETTE, Surveyor-General:

Sir:

I embrace this as the first favorable opportunity of acknowledging the reception of your circular, bearing date March the 1st, and also of transmitting to you an account of the resources of this county. And I am sorry to say that the data from which I have to report is not so satisfactory as I could wish.

COUNTY BOUNDARIES.

The exact topography of this county is not clearly ascertained, as there has been no actual survey made of the county lines, hence these must be imaginary. Puta River constitutes a part of the southern boundary, the Sacramento the eastern, there being no natural objects to designate the northern line, it being wholly imaginary, the summit of the Coast Range taken for the western boundary. The necessity of a proper adjustment of county boundaries and county surveys are too obvious to need comment. The probable area of this county might be placed at 370,000 acres. This, however, can only be considered as approximation. Of this there are 150,000 acres of arable land, the fertility of which is not surpassed in the State. In evidence of this, with proper culture it has been made to yield of the various kinds of grain, an average of forty bushels per acre.

There is of State, or unproductive lands, 20,000 acres; of tule lands, 80,000 acres. The reclamation of these lands is in my opinion questionable, situated as they are, contiguous to the Sacramento River, and occupying as they do a locality still lower than that of the river, would render it impossible by means of dyking. And even if then annual overflow of the Sacramento could be prevented by means of embankments, the inundations produced by Cache Creek and Puta, which streams emanate in the Coast Range, could not well be disposed of. It is needless to add, that these are the most fertile lands in the State, and a reclamation of them is much to be desired. The remaining portion being 120,000 acres, comprises the western and mountainous portion of this county, and is peculiarly adapted to grazing purposes.

As to the mineral resources, there have been no discoveries made, leading to the belief that there are any mineral lands within this county. There have been no geological investigations made to throw any light on that head.

PUBLIC LANDS.

It is not truly known whether there are any public lands in this county or not, but it is generally believed that all of the arable lands are occupied by Spanish grants, which has greatly retarded agricultural pursuits.

MACHINERY AND WATER PRIVILEGES.

Sacramento and Puta are the only streams affording water privileges for driving machinery, there being at this time a flouring mill on each one of these streams, at which is manufactured annually, 3,000 barrels of flour each.

There are no lumber mills, although the facilities for erecting are good enough. But the great scarcity of timber would render the enterprise useless and this might be reckoned one of the chiefest calamities under which our county labors.

BRIDGES.

The bridging of the above named streams is very practicable, and can be done at small cost – considering the great inconvenience of getting lumber, which would have to be brought from Nevada Mountains, a distance of seventy-five miles, the price being four cents per foot. There is not a bridge in this county. There is what is styled as a Plank Road Company, which has been partially constructed across the tule opposite the town of Washington, but to very little purpose, as ferry boats have to be used during the winter season. At this point the establishment of a good road is indispensable, and of vital interest to the county.

AQUEDUCTS.

There are no water deposits in this county, no means of irrigating aside from what naturally exists; no Artesian wells; and this last is in my opinion the most practical method of irrigating, the which is indispensable to the production of certain crops, such as vineyards, and especially team grasses cannot be produced without it. I do know of one or two persons who are raising water from the river by means of machinery, but this is a lasting tax, and inconvenient.

TIMBER TREES, ETC.

The native tree is the oak, cotton-wood and pine, but none are adapted to building purposes, being of a dwarfish and scrubby nature. The production of ornamental, and in short, of any kind of trees, seems as far as has been tried, quite practicable.

VINEYARDS.

The whole number of vineyards amount to two hundred, many, however, are quite young, and none producing. These have suffered severely from the swarms of grasshoppers that visited us this summer. Crops of all kinds have suffered severely from this devouring host, and some irreparable losses have been sustained. A mode to provide against the desolating effects of these insects would be of infinite importance. In consideration of the above cause, the production of the present year will fall much short of the usual amount. I will here append a list of the produce, as you require, for the present year:

PRODUCE.

	Acres.	Bushels.
Land inclosed.....	60,000	
" cultivated.....	40,000	
Wheat.....	15,000	600,000
Barley.....	20,000	800,000
Oats.....	3,000	120,000
Maize.....	300	9,000
		Tuns.
Hay.....		600,000
		Pounds.
Wool.....		200,000
	Pounds.	Value.
Butter.....	50,000	
Cheese.....	10,000	\$100,000
Eggs.....	200,000 dozen	
		Number.
Horses.....		6,000
Cattle.....		25,000
Sheep.....		2,000
Swine.....		35,000

Poultry, 14,000, at \$10,000.

ARTESIAN WELLS.

On the south side of Cache Creek, near the base of the mountain, in the vicinity of Buckeye and Cottonwood, and on the north side of the same creek, in the vicinity of Oak Hollow, it is believed that Artesian wells may be sunk to great advantage.

This completes the entire list of all that is cultivated in this county, to any extent worth of notice, all of which I transmit to you with the greatest respect.

Yours, etc.,

D. R. DIGGS,
County Assessor of Yolo.

COUNTY ASSESSOR'S OFFICE, Yuba County.

Hon S. H. MARLETTE, Surveyor-General:

Sir:

In accordance with your request, as per circular dated March 1, 1855, I send you the following statistical report for Yuba County:

In the absence of the late County Surveyor, who is at present engaged in surveying a road through the Hennes Pass, I have taken his statement made in 1852, of the number of acres of land in Yuba County.

Your circular was not received un time for me to report the amount of gold taken from the mines in this county, as a large part of the mining portion of the county had been assessed previous to the reception of your circular. I can only say, that from the best information that I can obtain, there has been more gold taken from the mines situated in this county, during the present year, than any previous year since the first discovery of gold in this State.

In relation to the cultivation of fruit trees, I had the promise, but as yet have been unable to obtain, a report of the observations of Messrs. Beach & Shepard, who have a large nursery and orchard on the east bank of the Feather River, between the Yuba and Bear Rivers. In their orchard most of the trees are three years old, and they would have had the present year a large yield of peaches had they not been destroyed by that pest of California, the grasshopper.

From my own observation, I think the climate of this portion of the Sacramento Valley not adapted to the cultivation of the apple and pear, but think they may be cultivated to advantage in the small valleys among the lower spurs of the Sierra Nevada Mountains.

There is some portion of the boundary lines of this county that are not plainly defined, and which, in my opinion, should be surveyed and more plainly established. The Act of the Legislature dividing the State into counties, and establishing the boundaries thereof, defines the boundary line between Yuba County and Plumas and Butte Counties, as commencing at the Lexington House; thence down the dividing ridge, between the waters of the Yuba and Feather Rivers, to the source of Honcut; thence down the middle of the main branch of Honcut Creek to where the same empties into Feather River.

The South branch of the Honcut has heretofore been considered as the main branch, but I have been informed by two of the Deputies of the United States Surveyor-General of this State, that the north branch of said creek is the main branch; and if such is the fact, Yuba County is losing the revenue upon a large amount of property situated between the two branches. Your attention is respectfully solicited upon this subject.

Below I send you such statistics as I have been able to collect during the past year.

LANDS.

	Acres.
Whole number of acres, estimate of County Surveyor.....	552,960
Susceptible of cultivation.....	280,000
In actual cultivation.....	18,000
Suitable for grazing.....	80,000
Mineral lands, unsusceptible for cultivation, and mostly heavily timbered.....	174,960

GRAIN, ETC.

	Acres.	Bushels.
Wheat.....	1,845	36,900
Barley.....	2,199	54,975
Oats.....	220	4,400
Corn.....	35	1,400

Tuns of hay, 2,733.
 Number of fruit trees, 8200. Vines, 17,000.

LIVE STOCK.

	Number.
Horses.....	1,272
Mules.....	1,074
Cattle.....	6,045
Sheep.....	805
Hogs.....	5,378

MILLS.

Number of saw mills driven by steam, six. Assessed value of the same, \$19,500.
 Number of saw mills driven by water, sixteen. Assessed value of the same,
 \$38,600.

Amount of lumber manufactured during the past year, 3,875,000 feet. Cost per
 thousand to manufacture, fifteen dollars; value per thousand, twenty-five dollars.

One flouring mill, propelled by water. Value \$3,000.

Amount of flour manufactured in five months, one hundred and fifty tuns.

Average yield of flour per bushel, thirty-nine pounds.

Number of flouring mills propelled by steam, five. Assessed value of the same,
 \$44,000.

Number of bushels of wheat ground during the past year, 69,406. Number of
 bushels of other grain ground, 26,456.

In the above mills there are twelve run of stone.

INCORPORATED TURNPIKE COMPANIES.

Number of, two. Cost of construction, \$35,000.

Yuba Turnpike Co. – From Marysville to Camptonville; length, forty miles.
Branch Turnpike Co. – From Oregon House to Lexington House; length, thirty-ones miles.

TOLL BRIDGES.

Number of, seven. Assessed value, \$48,000.

FERRIES.

Number of, eight. Assessed value, \$7,500.

WATER DITCHES.

Number of, eighteen, Assessed value, \$117,400.

QUARTZ MILLS.

Number of, two. Assessed value, #31,000.

FIRE COMPANIES.

Number of, five. Cost of engines and hose carriages, \$16,725.

Number of members of Fire Department, October 1st, 1855, two hundred and thirty-one.

Expenses of Fire Department of the City of Marysville during the past year, \$18,457 76.

Very Respectfully yours,

MIX SMITH,
Assessor Yuba County.

APPENDIX F.

1. REPORT OF WM. PATTON, OF CALAVERAS COUNTY, CIVIL ENGINEER.

CAMP SECO, Dec. 14, 1855.

Hon. S H. MARLETTE, Surveyor-General:

Sir:

At your request to contribute something to the Appendix of your report, I have the honor to forward the inclosed documents, which are the best results, in the limited time given, that my circumstances allowed.

No. 1, gives some statistical information upon works of public utility in Calaveras County. You owe acknowledgements to R. F. Wheeler and J. K. Doak, Esqs., for valuable assistance thereto.

No. 2, contains a map, or reconnaissance, and report, of an exploring expedition, from Murphy's Camp, in Calaveras County, to the head of Carson Valley *via* Chevron's Pass, in the month of August last. This document was drawn up, and the map executed, by Fra. A. Freeman, Esq., of Murphy's, one of the party, from the general notes, and examined and indorsed by Judge Noyes, also of the party, of the same place, as being correct as the circumstances allowed.

No. 3, contains a contribution, consisting of a diagram and subject-matter, upon a general and comprehensive internal system of railways for our State, with a view to assist in developing the most rapidly the manifold resources of the mountains, and aid the prosperity of the county in general.

[DOCUMENT NO. 1]

The following tables give a nearly accurate list of the works of public utility in Calaveras County:

Table No. 1. – Saw Mills.

The column H. P., gives the number of horse-power engine employed: P., indicated by the letter S. or W. whether the power employed by steam or water; column C., shows the utmost capacity in superficial feet of lumber, the establishments, as at present installed, can throw off per twenty-four hours; and if we take one sixth of the whole, a tolerable near estimate may be formed of the quantity of lumber consumed, per day average, in Calaveras.

SAW MILLS.

NAMES.	Locality.	H. P.	P.	C.
Mokelumne Hill Canal Company.....	Glencoe.....	25	S.	20,000
J. K. Doak & Co.....	Murray's Creek.....	16	"	10,000
N. T. Norcross & Co.....	Willow Creek.....	12	"	8,000
Wm. Irvine & Co. ¹⁴	El Dorado.....	40	"	9,000
Wm. H. Hanford & Co.....	Angel's Creek.....	25	"	20,000
Grant & Co.....	Jesu Maria.....	6	"	3,000
Henry Schabonell.....	Calaveras.....	12	"	9,000
Benson & Co.....	San Antonio.....	10	W.	4,000
McCuen & Co.....	Jesu Maria Creek..	10	"	4,000
J. McNaughton & Co.....	Stanislaus River....	8	"	3,000
San Antonio Water Company.....	San Antonio.....	8	"	4,000
W. H. Hanford & Co.....	Murphy's.....	12	"	6,000
Union Water Company.....	Angel's Creek.....	10	S.	3,000
Brady's Mill, (grist and flouring) ¹⁵	Mokelumne.....	8	"	2,500

Table No. 2. – Bridges and Ferries.

BRIDGES.

LOCALITY.	Form of Construction.	River.	Estimated Value.
Winter's Bar.....	Wire Suspension.....	Mokelumne...	\$15,000
Negro Cañon.....	Howe's Truss.....	"	14,000
Middle Bar.....	King's Patent Truss.....	"	28,000
Big Bar.....	"	"	18,000
Silver Mountain.....	Beam.....	"	3,000
Madina.....	"	Calaveras.....	4,000
Foreman's.....	"	"	3,000
Scott's.....	"	"	2,500
San Antonio.....	"	"	500
Stevenson's.....	"	"	8,000

¹⁴ Capable of augmentation.

¹⁵ Brady's, is the only Grist and Flouring Mill, within my knowledge, in Calaveras County.

FERRIES.

NAMES.	Locality.	Estimated Value.
Clay's Bar.....	Mokelumne.....	\$2,000
Poverty Bar.....	".....	4,000
Arkansas.....	Campo Seco, Mokelumne...	1,800
White's Bar.....	White's Bar, ".....	6,000
Reed & Co.'s.....	Stanislaus.....	20,000
Reynold's.....	".....	20,000
McClain's.....	".....	15,000
Pine Log Crossing.....	".....	2,000

Table No. 3. – Water Companies and Mining Canals.

NAMES.	Water From.	Miles long.	Estimated Cost or Value.
Mokelumne Hill Canal and Mining Com...	S. F. Mokelumne.....	60	\$460,000
West Point Ditch.....	N. of M. F. ".....	12	14,000
Cadwalader's ".....	" ".....	7	8,000
Sandy Gulch ".....	M. F. ".....	8	9,000
Rich ".....	N. F. Calaveras.....	9	10,000
Whisky Slide ".....	Calaveras.....	8	14,000
Table Mountain Ditch.....	San Antonio.....	15	22,000
San Antonio Branch Ditch.....		9	12,000
Calaveras & Camanche ".....	N. F. Calaveras.....	25	13,000
Union, San Andreas.....	Murray's Creek.....	14	13,000
Pope's Ditch, San Andreas.....	Willow Creek.....	5	9,000
North Branch.....	Murray's Creek.....	3	2,500
San Antonio Water Company.....	San Antonio.....	18	25,000
Union Water Company, Murphy's.....	Stanislaus.....	78	320,000
Eureka ".....		14	22,000
Albany Flat & Carson's.....		8	15,000
San Domingo Ditch.....		7	10,000
Vallecito ".....		4	6,000
Cayote Creek Water Company.....		5	8,000
Isabell, Jeffries & Co.....		5	4,000
Forman's Ditch.....	San Antonio.....	14	20,000
Add an aggregate for several other short paying ditches not denominated.....		40	14,000

MURPHY'S, Dec. 2, 1855.

To WILLIAM PATTON, Esq.:

Dear Sir:

Judge Putney, of this place, mentioned to me that you wished to procure an authentic account of the proceedings and explorations of the party who, last August, crossed over to Carson Valley to find a commodious and eligible immigrant road.

In furtherance of the matter, I applied to Mr. L. W. Noyes, from whose notes and memoranda the statement we send herewith is taken.

We also transmit a map of the route, which has been examined and approved by all the party, and is as nearly accurate, probably, as the circumstances, (that no measurement of hights and distances could be made,) will admit. The map and report will explain each other.

I am,

Respectfully yours,

FRA. A. FREEMAN.

SOME ACCOUNT OF THE EXPLORING EXPEDITION.

On the eighth of August last, an exploring party, consisting of six citizens of Murphy's and Douglas', left the former place to find and examine an eligible route over the Sierra Nevada, to connect with the immigrant road through Carson Valley.

The results of the expedition, as briefly stated below, are given from the memoranda and minutes of Mr. Leonard W. Noyes of Murphy's, one of the most active and persevering of the party, and the strict accuracy of whose statements may be confidentially relied upon.

It should be premised that the design of the party being rather to explore than to survey the route, they were unprovided with instruments proper for the latter purpose, and that the estimates of hights and distances are based upon such observations as could be made without such instruments.

2. REPORT OF L. W. NOYES, ESQ., OF THE CALAVERAS EXPLORING EXPEDITION.

From Murphy's to the Big Tree the road is familiar to most denizens of this and neighboring counties, as a commodious and pleasant one, and having its terminus at one of the greatest curiosities of Nature.

The distance of the Mammoth Grove from Murphy's is fifteen miles, by actual measurement, in a north-easterly direction. The road thence proceeds in nearly the

same direction (north-east) about eight miles, to a hill some mile beyond the new steam saw mill of the Union Water Company.

For two miles further on, the present road, after a rather abrupt ascent, passes upon the ridge of the hill to Black Springs, a fountain affording pure and very cold water in great abundance throughout the year.

The present road thence proceeds northerly one and half miles, then east one mile; thence east north-east two miles, to the Big Meadows. Then to road makes a descent corresponding with its rise this side of Black Springs.

It should be observed that at the outlay of a little labor, a good and level road may be made upon the southerly side of the hill, which would avoid the ascent and descent before mentioned.

The "Big Meadows" upon which is the rancho of Messrs. Smith & Co., is some fifteen miles distance from the Big Tree. The "meadow" is six miles in length and about half a mile in width. The road enters it about the center and proceeds to the head of it, following the course of one of the tributaries of the Stanislaus River. A branch of the Mokelumne also heads into this meadow.

We here reach the end of the traveled road, at a distance of thirty-one miles from Murphy's, and cross a mall spur of the divide between the Mokelumne and Stanislaus Rivers, thickly timbered with pine, and having an elevation of one hundred feet above the meadow, and a very easy grade on both sides.

Here the party descended into a valley (to which they gave the name of "Grizzly Bear Valley," and which is also designated on their map) abounding in grass and water, notwithstanding the extreme drought of the season. The valley is above five miles across in every direction, and nearly circular in form, and is watered by another branch of the Stanislaus which heads in it.

The valley was traversed in a north-easterly direction three miles, and after a rise of about one hundred feet upon a spur of the divide above mentioned, the meadow named by the party "Silver Valley" was entered on the south-west side. Thence for eight miles their route proceeded upon a level, through a continuous meadow, along the base of the divide, crossing many little brooks that all run into the Stanislaus.

A choice of roads is here offered, neither of which presents any serious obstacle.

An easy ascent of about fifty feet brings the traveler upon the main divide between the Stanislaus and Mokelumne Rivers, upon which is a small lake of pure water.

Thence descending about three hundred feet on an easy grade, and following a branch of the Mokelumne for little more than half a mile, the road crosses it, where a bridge of some two rods in length would answer for all seasons.

Immediately after this crossing, a level bench upon and around a rocky hill, may be turned to advantage. At the distance of a mile Mokelumne Valley is reached, (so named by the expedition), where a small bridge of a rod in length will be required.

Leaving this valley in a westerly direction, and following a curve line round a hill for about a mile, the first summit is reached, the course being north-east, and continues in that direction over an incline and through a flat thickly timbered. Here are several small lakes and abundance of grass.

Three miles further on is Indian Valley, at an elevation of about one thousand feet above Mokelumne Valley. This part of the road p the hill can be made upon a

bench or shoulder of it, by removing some granite boulders which are thickly scattered about. The grade is an easy one throughout the entire distance.

Indian Valley is the largest the company found, and branches of the Mokelumne and Carson Rivers head into it. An Indian trail leads down by a branch of the latter, over which the explorers found no difficulty in driving their pack mules to a pass which is supposed to be the lowest in the Sierra Nevada. It must be mentioned that it falls off nearly perpendicular, and considerable labor will be required to make a track upon the north side.

Indian Valley was left about two miles east of where the party entered it, and proceeding north three miles through a thick timber between two small lakes, marked "Twin Lakes" on the map, up Charity Valley to the main summit pass, at an elevation of not more than one hundred and fifty feet above the level of Indian Valley. Near this pass to the east (Monument) is a high mass of conglomerate rock, jutting out from the side hill, and having the appearance of an artificial monument, and serving as a noticeable land-mark. It was estimated to be between one hundred and fifty and two hundred feet in height.

The pass must be some hundreds of feet lower than the summit of the pass on the Hangtown Road, as Messrs. Noyes and Capron followed that road to an elevation far above the pass, to which the exploring party gave the name of Governor elect.

From this – the main or summit pass – the traveler descends about one hundred feet, and enters the westerly end of a valley or meadow about five miles long, to which the party gave the name of "Faith Valley." They traversed this valley about a mile, and leaving it upon the left or north side, descended a hill with an easy grade, perhaps two hundred feet in perpendicular measurement, and struck the head of Hope Valley, (well known by that name to the immigrant), and two miles distant from the Carson Road. Thence, and through Carson Cañon to the valley of the same name, is the usually traveled immigrant road.

It should be said, in conclusion, that the entire route explored every where abounds in grass and water, with plenty of timber at hand.

Some of the party, who have again crossed and re-crossed by the route since their first exploration, are satisfied that the minutes, and the map and reconnaissance based upon them, are as correct as may be without actual survey and measurement.

There is little doubt that the above offers the most eligible route for either a wagon or a rail road across the Sierra.

For any further information, recourse may be had to Mr. L. W. Noyes, at Murphy's.

FRA. A. FREEMAN.

The above account and map of our trip across the mountains, by Judge Freeman, is a high correct as may be without survey.

(Signed,)

L. W. NOYES.

3. CONTRIBUTION OF WILLIAM PATTON, CIVIL ENGINEER, TREATING OF A GENERAL AND COMPREHENSIVE INTERNAL SYSTEM OF RAILWAYS FOR THIS STATE.

[DOCUMENT NO. 3.]

Facility of transportation, for internal commerce, is acknowledged to be the first great auxiliary to national progress.

Twenty-five years ago, common turnpike roads were found unadapted to modern improvement.

Every county is benefited by the introduction of railways, more especially when arranged comprehensively.

California, physiologically speaking, is one of the finest and richest countries in the world; rich in gold mines, scarcely developed; brilliant in agricultural capabilities; full of material resources, of infinite kind, laying dormant; wealthy in capital, estate and labor, and filled with an energetic and speculative population – has neglected her surest means of more rapid advancement – her railway system.

From your general invitation, inclosed to me, in the second sub-section, Section nine, of “An Act concerning the Surveyor-General,” I make free to forward you a diagram and explanations upon the subject above adverted to, suggestive towards a design for a general railway system along the eastern margin of the great interior valley of this State, so as to comprehend the traffic of and with the gold regions.

I make no note of present legislative difficulties, but confine myself to economical and engineering views of the subject, with its attendant geographical conditions.

A main trunk line, marked A on the diagram, it is proposed may run along the foot hills on the eastern edge of the Sacramento and San Joaquin Valleys as far directly throughout the State, as the traffic may develop itself from time to time, which, for the present, we may suppose to extend from the foot hills, near Ophir, Butte County, on the north, to Empire City, Tuolumne County, on the south – a distance of about one hundred and fifty miles.

On this line, a great central station may be placed somewhere near the western boundary of Amador County, between the Cosumnes and Mokelumne Rivers, joining trunk lines at that point to Stockton and Sacramento City, marked B and C respectively. These show the whole of the main trunk lines.

The line of railway, thus connecting Stockton with Sacramento, would measure about seventy miles in length, and be sufficiently direct to serve for purposes of traffic between the two cities, but their chief utility would, by this arrangement, consist in the equal availability of both to run to the northern or southern mines.

Branch lines, of which five would be sufficient in all, from the main line A, within the limits mentioned, would convey traffic, as far as practicable, into the mountains, and form distributing points at the termini of each.

The length of the branch lines, we may assume, would average fifteen miles each.

If we say, therefore –

150 miles of foot hill line, at \$10,000 per mile, grading and plate laying, (single track,).....	\$1,500,000
70 miles Stockton and Sacramento line, at \$10,000.....	700,000
75 " Sacramento branch line, at \$14,000	1,050,000
Locomotives, carriages, stations, etc.....	<u>1,200,000</u>
Showing.....	\$4,450,000

To be the cost total to execute a grand and useful work, actually needed by us, not amounting to more than a month's produce of the mines, for whose benefit it would and must most especially be preferred.

I give this estimate of cost of railways, executed according to the line shown in the diagram, merely to popularize the idea, so that, if not this, some other great railway system may be brought forward, and executed for the benefit of ourselves and our successors.

Fire wood, lumber, marble, granite and lime, alone, would soon form no inconsiderable item in the return trade to the valley, which, instead of importing, we would be in a position to export, with all that our mountains could yield of material wealth, thus gaining so much by keeping money, that would otherwise be lost to us, and tending to the retention of the produce of our gold mines among ourselves, to be used in developing our own resources.

I have the honor to be, Sir,
Your most obedient servant,

WILLIAM PATTON.

APPENDIX G.

1. NEW ENGLAND NURSERY.

The following communication “was prepared for the use of the Surveyor-General of the State,” at the request of the gentleman to whom it is addressed, and is considered well worth a place in this report.

S. H. M.

“NEW ENGLAND NURSERY,
Marysville, Oct. 20, 1855.

MIX SMITH, Esq., Assessor of Yuba County:

Dear Sir:

At your earnest request, and as per promise, we will give you a statement of our orchard and nursery operations, as also of our observations of the adaptation of the soil and climate of this section of the State to the culture of fruit, and the general method of treatment necessary to insure success. To go into every minutiae it would require a book, but we will, in a condense form, endeavor to meet your wishes.

Our orchards and nursery grounds are situated on the east bank of the Feather River, four miles southerly from the City of Marysville, on the stage road to Sacramento. Our orchard was set in 1853, being less than two years. The trees are three years from the bud and graft, and were grown by one of the partners, Mr. Shepard, who is a practical nurseryman, from New England. The buds and grafts were selected from bearing trees, which he had tested, and knew to be all true to their name – a result of most vital importance to nurserymen who are propagating tress for sale, for it is no uncommon thing for those who have set trees purchased at random, to find themselves sadly disappointed when their trees come into bearing. And every State should pass stringent laws against such bogus sales, for there is not the loss of money only, but loss of time, which cannot be redeemed. It costs no more to grow trees of the most choice varieties than it does the meanest scrub, while the fruit of the one is always in ready demand, and the other is a drug in market.

We have in the nursery a general variety of fruit and ornamental trees, shrubs and vines; the numbers it will be impossible to give. The number of fruit and ornamental trees may be near 20,000.

We are cultivating the Ossage orange for hedging, and the experiment is of the most satisfactory nature, so far as the growth of the plant and the barrier it offers is concerned. There has been great difficulty in obtaining good seed, which, when fully corrected, will give an impetus to the business, and the Osage fence is sure to supercede all other through this valley.

We are cultivating the Chimisol, or by some called the Escalonia, a beautiful evergreen, thrifty, and very tenacious of life in high or low lands. This shrub is

indigenous to California, and when well cultivated, is unsurpassed in beauty. Also some 2,000 of the evergreen oak of California, a few English walnut, Spanish chestnut and the New England horse-chestnut tree.

Our experience and general observation has fully convinced us that the Sacramento Valley climate and soil along the river bottoms, can hardly be matched in other portions of the State for the growth of all stone fruit, viz: the peach, apricot, nectarine and plum, and we will add the cherry; and if not matched in California, we challenge the world. The pear does well here with care, and probably as well as in any locality in the State. The fig really excels here, yielding one heavy crop on the wood of the previous year's growth, and blooming and ripening, without intermission, until the winter season, on shoots of the present season's growth. This cannot be the result where the summer season is short, or where the chilling winds prevail in the fruiting seasons. Properly trained, the fig is the most beautiful shade tree in the world.

The apple, with us, seems to have its enemies – the borer and sunblight. The pear has some hindrance by the same cause, but very much less so. The fig has no destroyer with us, and we hear of none in the valley, and for the reason that the milk or sap of the tree is offensive, if not poisonous, to insects. Even grasshoppers will avoid them, while there is a green thing left beside. The quince is somewhat a sufferer by the borer and sunblight, but less so than the apple. Of the remedy for these evils we will speak before closing. We find it universally the case that imported trees suffer from these causes vastly more than those grown in the State. The transfer through an extreme climate evaporates a vast quantity of the sap, and one or two seasons is required for its recovery, and it probably never will make so fine a tree as those grown here.

This fact all nurserymen in the State agree on, that a tree in the bud grown in California, is worth more than one imported, even if it be two years growth. Pomegranates do well here, and some even favor them for hedging, but one Osage fence is worth a dozen of them.

For grapes of all the varieties, our climate will equal any in the world, and soon we will give ample proof of the assertion. General Sutter's grapes are not quite as large as those from Los Angeles, but are sweeter; and the cause is, that his vineyard is on a very high and dry soil, and what we term the upland, which does not yield to the vine the moisture necessary to fill out the fruit. Manures are the gardener's stay, but no medium can substitute for water, heat and light.

The strawberry does very finely here, when they can be constantly supplied with water, and this they must have. This is a natural climate for the raspberry. Gooseberries and currants in our climate, require moist land or irrigation; the bay or mountain atmosphere is rather more kindred. Roses and flowers generally will excell, with liquid manure and liberal moisture, systematically applied. We believe, in this valley, we can beat the world in the growth of the trees and vines, with a full supply of water in the soil, or by means of irrigation. Give us water and you make us an Eden, which we hope to obtain by Artesian wells or otherwise.

We sunk an Artesian well last winter to the depth of 300 feet, and secured it well with galvanized iron. We obtained no flow, but shall prosecute the work at some

future time; had contracted so to do this summer, but the loss of our entire crop of fruit by grasshoppers, caused us to defer.

This season we have had the aid of water pumped by steam, and although our works were not completed until very late in the season, we were enabled to arrive at this conclusion, that one month's sun with water, is worth three without. With these elements combined, nature seems full of her pranks.

For two years we have been selling small lots of trees and vines to be set out in the mountains, and we have the most satisfactory reports of them. The experiments prove fruit-raising in the hills not longer a venture, but more than the substance, (gold,) which, in part, forms those hills. In Downieville, Grass Valley, Nevada, and other situations of equal altitude, it has been fully substantiated that the mountain winters are a benefit rather than an injury to the tree, while the spring frosts have proved of no injury to the blossoms or fruit. We recently visited a majority of the farms and gardens contiguous to Grass Valley and Nevada, as also those on the way up. Mr. Montgomery raised this season, some ten bushels of peaches, at his farm in Penn Valley, near Rough and Ready, and obtained for them more than enough to pay him back the original cost, labor and interest. The trees we saw at Mr. McCarty's, as also at the farm of Mr. Collier, both near Grass Valley, and those of Mr. Turner near Nevada, and Mr. Moody's (Empire Rancho), all without exception, prove fully the success of the little mountain orchards. Vines seem to do surpassingly well.

Apples have proved themselves well at ease in the mountain atmosphere. The test by Mr. Shearer, at Parks' Bar, as also by others higher in the hills, has been a very good one, for no fairer or finer ones have been grown in the State. In time we shall look to our mountain neighbors for a portion of the apples which we eat. And when the iron horse speeds his way through the mountains and over the plains, to our eastern cities, then will these elevated neighbors come into competition with us in sending to our eastern friends our delicious fruits one month ahead of their own raising. And then will they look to California for their choice wines and grapes.

REMEDIES FOR DISEASES, AND PRUNING OF FRUIT TREES.

If the apple, pear and quince trees, in this valley, can be carried on to a successful growth, until they have attained this age of three years, but little fear need then be entertained for their future progress, even in the absence of that especial care previously bestowed on them – but that which is worth doing at all is worth doing well. The best and surest remedy against the blight and borers, is an abundance of water, so as to keep the sap in a continuous flow, thereby keeping the tree in a constant growing state in summer. These are not the trees the borers are most pleased with; the fly chooses to deposit her eggs in trees rather dormant, and these are the kind of trees which become infected with the sun blight. In these trees, subject to the blight, the sap is thinner than in trees of stone fruit, and when flowing in a dormant state, the scorching sun on the bark evaporates the little sap in motion, which adheres the bark to the wood, when all circulation is checked, and as there is no medium of conveying to the root the gasses received by the leaves, which is necessary to neutralize the gasses received at the root, death to the tree ensues. Shading the trunk of trees, the side which receives the most sun, by clapboards, will

be found beneficial, but a better remedy is to hoe back the soil from the tree, some two or three inches deep, and wind the trunk of the tree with a cloth, loosely, for eighteen inches in light, or cover the tree to the height named, or even to the limbs, with tar. Then put ashes around the trunk for three or four inches in depth. Do this about the middle of March or first of April, and keep the trees well watered, unless the soil is really very moist, and the remedy will be found quite sure. Before doing this, the tree should be thoroughly examined, near the ground, to learn if the borer has been wintering in the bark or heart of the tree, where they are more oftener found than under the bark. If their trace is noticeable, follow them up, cutting carefully with a knife, until he is dragged out and destroyed; cover the wound with grafting wax, or with a tenacious clay, and fresh stable manure of equal parts. Before these remedies are applied, it will be well to wash the trunk of the tree with a solution of potash, say one pound of potash to two gallons of water. And, in fact, every tree in an orchard should have this wash applied with a brush, about four times a year. This wash is very beneficial in loosening and enlivening the bark. In foggy, or long damp warm spells, in the latter part of winter, trees are apt to bleed, and sometimes badly, and no remedy is so good and rapid as the potash wash applied to the trunk of the tree, as also on any portion of the limbs which bleed. It is unusual, when the peach, as also other trees, come into blossom, at a time when there is a very dry warm spell, for the blossom louse to make its appearance, and unless checked will destroy much of the fruit in embryo, as well as to check the tree in its growth. This is indicated by the curling of the blossom, as well as the leaves of the tree. The insect is of a maroon, or dark brown color, and about the size of the head of a small pin. The remedy is soap and suds of medium strength, applied with a syringe, or dashed on with a small clothes broom. This is used with impunity to the blossom, while it destroys the insects. Clod rains have nearly as good effect. Stone fruit set in bottom lands, do not need water of necessity, unless it is desired to force a very rapid growth, and excepting trees set very late in the season, in sandy soil, then the stimulus is rather necessary, until they appear to have a healthy start, and if continued through the season for the first year, the tree of course becomes larger. When trees, by cattle or insects, lose their leaves, watering aids to resuscitate them. The trees of all stone fruit, and other of a very rapid growth generally, should be headed in, every winter, one-sixth or one-eighth. Trees in this climate grown to limb within one or two feet of the ground, will prove the best bearers. In setting trees, set them no deeper than when grown in nursery, except in sandy soil, then two or three inches deeper will be well. Mulching trees and vines with old straw or chips in the spring, is the greatest service imaginable. The cultivation of vegetables (but not grain) among trees, is very beneficial.

We have devoted more paper to this subject than we intended, but with the view of fully meeting your expectations.

We remain, dear sir, very truly, etc.,

BEACH & SHEPARD.

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