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REPORT

ON

MINING IN THE STATE OF CALIFORNIA.

BY

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PRESENTED TO BOTH HOUSES OF THE GENERAL ASSEMBLY, BY COMMAND OF HIS EXCELLENCY.

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REPORT ON MINING IN THE STATE OF CALIFORNIA,

MORE PARTICULARLY AS REGARDS WATER RIGHTS, ALLUVIAL DIGGINGS, AND QUARTZ REEFS.

Water Rights.

BEFORE considering the question of water-rights, as now existing in the State of California, perhaps it may be proper to state the plan I have adopted in reporting upon this portion of the subject submitted to me.

For the convenience of reference and other reasons, I have divided my remarks into two portions, the first being for the most part introductory, and containing, amongst other matters, some passing observations upon the materials now being used in the construction of water-races, and the measurement of water as carried out in the State. In the second portion, I intend giving an account of the water-right system itself; the right upon which this system is based; the legislation in reference thereto; and as many of the principal cases which have been decided by the Courts of Law, Supreme and State, as I have been able to procure.

General Remarks.

Even if the time at my disposal had been of sufficient length to permit of my doing so, it would be useless to enter into any description as to the modes adopted throughout the State of California, and those States adjoining wherein the pursuit of mining is followed, in the construction of water-races, dams, &c.; for the methods adopted in this State and in New Zealand differ very little, if at all. Here, as with us, the water flowing down from the high snow-clad ranges in channels, for the most part steep and precipitous, is preserved in reservoirs, and conveyed along races or "ditches" for the supply of alluvial or "placer" diggings and quartz-reef workings. As a general rule, however, the reservoirs and races of this country have been constructed on a more gigantic scale, and at a proportionately larger outlay of capital, than in New Zealand. But, as a rule, experience shows that these large and costly undertakings have not paid; whilst, on the other hand, the smaller works have usually been successful. Indeed, taking the water operations throughout the State generally, failure has been the rule and not the exception. Of late years a great decline has taken place in the alluvial diggings of California, and a corresponding decline in the demand for water has of course followed. It is estimated that 25,000,000 dollars have been invested in the water-works of the State, and that the present actual value does not exceed 5,000,000 dollars. The Trucker, for instance, a race which was constructed at an original outlay of 105,000 dollars is, I am informed, now gone to ruin. Many miles of water-races in the district of Columbia, and in other districts as well, have been abandoned; nor do I think it is too much to say that the annual decrease is fully 15 per cent. of the whole number. From an experience, such as is that of California, acquired by the loss of so much time and so much treasure, some useful lessons may be gathered. Not the least noteworthy of these, perhaps, is that fluming, wherever possible, is to be avoided, even under the most favourable circumstances. The cheapest flume in the country costs twice as much as the cheapest race, of the same capacity; whilst the cost of keeping the flume in repair is fully 80 per cent. more. Then, it is found that to erect a flume 25 feet high, costs twice as much as to lay it on the ground; whilst at 60 feet, it costs four times as much; and the keeping of a flume in repair annually costs a seventh of the original outlay expended upon it.

Iron Piping.

Iron piping is now very generally used as a substitute for fluming. It is not only cheaper and more durable than the ordinary fluming, but it possesses this advantage also, that by its use water can be carried across gullies of a very considerable depth, and where fluming would be impossible. For instance, at a water-race now in course of construction at Feather River, by means of this piping water is carried across a gully of considerable width and 800 feet deep. The Secretary of the Spring Valley Water Works, from whence the water supply of this city is obtained, who gave me the above particulars, further informed me that this piping is now being extensively used along the works of the Company. Speaking from personal experience, I know of no gold field in New Zealand where this method of conveying water is now in use, nor do I believe it has been tried on any of them, or if it has, it has been on a limited scale only. I have therefore used every effort and devoted some time in procuring all possible information about the matter. I believe the system to be peculiarly applicable to the nature and requirements of the Colony. The sheet-iron most commonly used in making the pipes is No. 20, and the size of the sheet 6 feet by 2 feet. The diameter of the pipe is usually 11 inches, and the pipes are made in joints 2 feet long; the joints being riveted together form sections 20½ feet in length. Small hooks are fixed in the ends of the several sections, and these are lashed together by tying them with wire, by which means the sections are kept from moving and in their proper positions. The piping is used in the form of an inverted siphon, carrying the water down the side of the gully which has to be crossed, and up again the opposite side to the same level. In laying down the pipes, each section is secured to a post, and the post itself kept in its proper place by a board placed edgewise and crosswise in the ground. An inch and a half or two inches is allowed for the lap of each section, and it is perhaps needless to say the ends must be carefully fitted into one another, so as to be water-tight, or as nearly so as possible. It may be further stated that the piping must be, as nearly as circumstances will

permit, put together in a straight line, and the sections driven home by placing a board across the end and striking it with a sledge-hammer. Tar, as a preservative, is applied outside, and, when practicable, inside also, before the piping is buried in the ground. At Feather River, the case I have already referred to, the water is carried down the side of a gully 950 feet on the decline, and up the other side a distance of 900 feet; the total depth, as stated, being 800 feet. By this plan the water is conveyed across a gully at Placerville 1,700 feet wide and 200 feet deep, at a cost of about £400; whereas the cost of fluming the distance would not have been less than five or six times that amount. The Manager of the Vulcan Foundry, in this city, informed me that piping of this description, 11 inches in diameter, and made of No. 20 sheet-iron, costs 1 dollar 5 cents the foot. It will carry 95 "miner's inches" of water, and sustain a span of 220 feet. At 190 feet, the pressure is 88 lbs. to the cubic inch.

Measurement of Water.

Throughout the Mining States of the Union, the inch measurement is used in dealing with water; and by this inch measurement is meant the quantity of water which escapes through an opening an inch square, with a pressure of water usually 6 inches in height above the opening. This is called the 6-inch pressure; but in this latter particular the measurement varies, the pressure in some localities being as high as nine and even ten inches. Some time since a Bill was introduced into the State Legislature, for the purpose of preventing disputes arising as to the meaning of a "miner's inch of water," and providing that it shall be held to mean $2\frac{2}{3}$ cubic feet of water, or $145\frac{4}{5}$ lbs. or $7\frac{2}{5}$ gallons passing a given point in a minute of time. To this an amendment was proposed, declaring that "a legal inch of water sold for mining, agricultural, or other purposes, shall mean the quantity of water that escapes through an opening an inch square, through a plank one inch thick, with the pressure of seven inches measured from the centre of the orifice to the surface of the water." But the further settlement of the question was postponed, nor do I think that any further effort at legislation was made respecting it.

I.—*System of Water Rights.*

Briefly stated, the supply of water on the gold fields is governed by the following leading principles.

The water of any creek, stream, or river, may be diverted from its natural bed, and never again returned to it.

The water becomes the property of the first claimant, but it so becomes only for the purposes for which he claimed it, and to the extent to which he appropriated it.

The holder of water has a right to its use without any obstructions from later claimants; but other persons may use the water, provided it is returned clear and uninjured above the point from which the first occupant took his supply.

If a miner, after claiming and using water, abandons it, allowing it to run into any channel or race used by another, then the latter becomes the owner.

If a race is cut for drainage alone, another may claim the water for mining or other purposes.

When the waters of a race are turned into a natural stream, with the intention of being taken out again in the same quantity at a point lower down the stream, they may be so taken out, even though the stream is being used at the time by another person.

No one has a right to take any water from the bed of a stream in which there is a mining claim of prior standing, and that cannot be worked without this water.

The Right to Water, upon what based.

The common law with regard to water-rights having been found unworkable in this state, the Courts, by their decisions, have built up a system of water-rights based upon "the wants of the community," to quote the words of Chief Justice Murray, "and the peculiar condition of things in this State, for which there is no precedent, rather than an absolute law, governing such cases." The reason stated for this departure from the law is, that at common law the right to running water was founded upon the title to the land upon the banks of the stream; whereas in this State the settlers upon the public lands, mineral and agricultural, could claim no such right, because they were not the owners of the land. Then the broad principle was announced, "That the right to an unlimited supply of water in a running stream vested in the first appropriator, whether a riparian owner or not, with the right to divert for any purpose, mining or agricultural, for sale or otherwise, and to any extent; and that subsequent locators could only acquire an interest in the water subordinate to the rights of the first appropriator." This is the broad principle laid down by the Californian Courts, and upon this principle the right to water is based.

Legislation.

The general legislation upon water-rights is very brief, being contained in the 9th section of the Act of Congress, 1866. It enacts, "That whenever, by priority of possession, rights to the use of water for mining, agricultural, manufacturing, or other purposes have vested and accrued, and the same are acknowledged by the local customs, laws, and decisions of the Courts, the possessors and owners of such vested rights shall be maintained and protected in the same, and the right of way for the construction of ditches and canals for the purposes aforesaid is hereby acknowledged and confirmed: Provided, however, that whenever, after the passing of this Act, any person or persons shall, in the construction of any ditch or canal, injure or damage the possession of any settler on the public domain, the party committing such injury or damage shall be liable to the party injured for such injury or damage."

By the section just quoted, as will be seen, the title of the raceholder takes precedence of the title of the claimholder; and consequently, if a race is injured in any way by a miner, he becomes liable for the damage. The Water Race Company, in fact, acquires a title to the land on which the race is made, and to as much more on either side as may be necessary for its safety and proper working. Here, as in New Zealand, the rights to water and the rights to mining claims are based upon the same principle—that he who first uses and takes up either is entitled to its possession. But there is this difference, that in California the size of the claim is definitely fixed by the laws of the district in which it is situated; whereas the quantity of water used is really unlimited, or limited only by the purpose for

which it was first appropriated. Then the title to water, like the title to a claim, in acquiring it or perfecting it, is not dependent on local rules. It may, as a matter of course, be abandoned, whenever the owner so pleases, but it is not held upon any condition by which it may be lost, unless, perhaps, the failure to carry out the purpose for which it was taken up, or the accomplishment of this purpose. There is this very noticeable feature, too, in the title of water, which is deserving of some attention. This title can be acquired for agricultural or manufacturing purposes as well as mining; or, indeed (when the appropriation is made for the special use of these industries) in preference to mining, to which the law, even in mining regions of the State, gives no preference in this respect. Whilst upon this point, I may be permitted to say that just now there seems reason to believe the purchase of the water-races of the State by the Government is not very far distant. The fact that large portions of auriferous ground are abandoned owing to the high rates charged for water, will not assist in bringing about the adoption of this policy to the same extent as the requirement of the water for those new industries which are daily springing up throughout the State. For instance, it is now ascertained beyond doubt that the foot-hills of the interior—those great spurs running out of the Sierras—are peculiarly adapted for the cultivation of tea, if only a sufficiency of water were procurable at moderate charges. A colony of Japanese settled down amongst these foot-hills have already, I am informed, sent to this market a few chests of the tea produced there, and it has been pronounced excellent in quality and condition.

There is no State legislation upon the subject of water-rights for mining purposes. The only reference to water supply made by the State is in the case of agricultural districts; but as this is intended to facilitate irrigation, it does not come within the scope of this report.

Decisions of the Courts upon some of the principal Water-right Cases.

In order rightly to understand the water-right system of California, the decisions of its Courts must be consulted and studied; for upon those decisions, gradually incorporated into the legislation of the State—taking, in fact, the place of that legislation, and now as firmly established as the principles of law regulating any other species of rights—the present water system is built up and regulated.

One of the first cases which came before the Court for its decision was that of Eddy *v.* Simpson. The action was brought to recover damages for interfering with the water-rights of the plaintiff, who had the prior occupation of the waters of Shady Creek, by means of a dam and water-race used for mining purposes. The defendant had taken up two neighbouring creeks, some of the water from which found its way into Shady Creek by natural channels, and in order to regain that water, he built a dam upon the creek above that of the plaintiff. The Judge charged the jury as follows:—

"As a general rule, the party who first uses the water of a stream is, by virtue of priority of occupation, entitled to hold the same. If a company of miners construct a ditch (water-race) to convey water from a running stream for mining or other purposes, and they are the first to use the water and construct the ditch, they are legally entitled to the same as their property, to the extent of the capacity of the ditch (race). For if it appears that there is more water running in the stream than the ditch of the first party can hold and convey, then any other party may rightfully take and use the surplus, and it does not matter whether the excess of water be taken from a point above or below the dam of the first party."

This rule was then applied to the facts of the case, and the jury told that the plaintiff was entitled to the quantity of water he appropriated, and no more; and if the defendant, by the construction of his race and dam above that of the plaintiff, diminished the quantity of water taken up and used by the latter, then he was liable for damages; but if the defendant put into the creek as much as he took from it again, the plaintiff was not injured. One of the principles decided by this case, and hereafter referred to, is, that a person once parting with water, by permitting it to flow into a constructed race or reservoir, loses all further right to its use.

The next case of importance bearing upon this subject to which I shall refer, is that of Tartar *v.* Spring. Briefly stated, the facts of the case are these:—The plaintiff was a mill-owner, and in 1852 diverted a portion of the water of Spring Creek for the use of his mill. In 1853, the defendant built another dam five miles higher up the creek, in order to convey the water to his claim, and an injunction was sought to restrain him from doing so. The Judge, in reviewing the case, remarked that "the current of decisions goes to establish the policy of the State to permit settlers in all capacities to occupy the public lands, and by such occupation to acquire the right of undisturbed enjoyment against all the world but the true owner. This policy extends to all pursuits, without any partiality for one more than another, except in the single instance where the rights of the agriculturist are made to yield to those of the miner when gold is discovered in his land. The defendant," the Judge goes on to say, "insists that, as the State has granted the right to dig for gold, all of the incidents necessary for that purpose, wood, water, &c., must follow. This is certainly the doctrine of the common law, and would be held decisive of this case in the absence of any other right to contradict it. But in previous cases we have shown that there is nothing sufficiently expressive in the character of this legislation which warrants an interference with already-acquired rights." The water was declared to belong to the mill-owner under his first appropriation.

In a case where a party of miners settled upon the banks of a creek, and the waters of the creek were afterwards diverted by a second party, the instructions given by the Court set forth, "That where parties have taken up claims on the banks of a creek or stream, and are using the bed of the said stream for the purpose of working their claims, any subsequent erection of a dam or embankment, which will turn the water back on such claims, or hinder them from being worked with flumes or other necessary means and appliances, is an encroachment on the rights of said parties, and they are entitled to recover damages for the injuries they sustain."

Crandall *v.* Wood.—This is an important and interesting case, wherein a new phase as to the right to water is developed: the principle of appropriation modified by the application of what is known in common law as "Riparian Rights," and the rule laid down that a settler occupying the public lands stands on the same footing as if he were the owner of the land, provided his occupation had priority to protect his rights to the water. In 1850 Wood settled upon the public lands, and from his ranch or farm sprang the water in dispute. In 1852 Wood sold the privilege of diverting this water to the plaintiff

Crandall. Jamieson, the real defendant in the case, had a ranch adjoining, upon which he had settled in 1851; and the springs rising in Wood's ranch, after uniting and forming a natural channel, flowed through the lands of the latter, and was used by him for the purposes of irrigation until this action arose. The plaintiff, under his bill of sale from Woods, claimed all the water accruing from the springs, without any regard to its natural channel. The Chief Justice stated the question involved to be, "Whether a party who locates upon and appropriates public lands belonging to the United States is entitled to the streams and watercourses naturally flowing through such lands, as against persons subsequently appropriating and using the waters of said streams." The Court decided the question in the affirmative. The arguments used by the Chief Justice may be summarized thus:—By the common law, the owner of land on one side of a watercourse owns to the middle of the stream; and if on each side, he owns the bed of the stream, and is entitled to the use of the flowing water, the property in the water consisting rather in its use than in the fluid itself. But this riparian ownership must be exercised, so that the least possible amount of damage shall be inflicted on others; and to this end the law has laid down the use of water to be twofold,—firstly, natural, to quench thirst, water cattle, and other domestic purposes, which purposes must be first supplied; secondly, artificial, for the use of mills, manufactories, and the like, not indispensable to man's existence. There was this difficulty, however, in this case, that the defendant was not the owner in fee. This point is thus disposed of by the Court:—"The defendant, having appropriated land over which a natural stream flowed, he is to be held as having appropriated the water of such stream, as an incident to the soil, as against those who subsequently attempt to divert it from its natural channel for whatever purpose. He who locates upon the public land becomes the owner thereof, as against every one else but the Government, and is entitled to all the privileges and incidents which appertain to the soil, subject to antecedent rights."

The case of Esmond *v.* Chew is a dispute between two miners using the water of the same stream upon which their claims were situated. The defendant first took up his claim in the bed of the stream; and the plaintiff's claim adjoined it lower down. The defendant worked his claim so as to injure the plaintiff by constructing a flume over it, and depositing his tailings on it to such an extent as to cover it up. The rule laid down was, "That every person mining in the same stream is entitled to use, in a proper and reasonable manner, both the channel of the stream and the water flowing therein; and where, from the situation of different claims, the working of some will necessarily result in injury to others, if the injury be the natural consequence of the exercise of this right, it will be *damnum absque injuria*, and will furnish no cause for action to the party injured." With regard to the priority of right to the use of water, when not dependent upon the property in the land, it is held that the survey of the ground, putting in stakes along the line, giving public notice, and actually commencing and diligently pursuing the work, is as much a possession as the nature of the subject will permit, and form a series of acts of ownership which are conclusive of right. But if the work is commenced by parties who have not the means to carry it out in a reasonable time, they will not be allowed, as against subsequent appropriators, to urge the want of means as a reason for not prosecuting the work.

II.—*Tenure of Mining Claims.*

Under this heading, I have included, and intend briefly touching upon, the three sub-divisions following:—

1st. Mining Rules, Regulations, and Customs.
2nd. Title to Mining Claims.
3rd. Methods of Working.

Mining Rules, Regulations, and Customs.

Upon the acquisition of the State of California, and the subsequent discovery of gold, the Government of the United States remained passive, allowing the population flocking thither to adopt a system of mining regulations of their own. When, shortly afterwards, the State Government became organized, it simply continued the state of things it found existing at the time, and in this way it has come to pass that the laws of the miners themselves have practically and virtually become the laws of the State. These rules and regulations have been adopted from the mining laws of Spain and Mexico, "by which the right of property in mines is made to depend upon discovery and development; that is, discovery is made the source of title, and development, or working, the continuance of that title." In the early days of the diggings, the large influx of miners from the Western Coast of Mexico and from South America, as well as from Cornwall, necessarily dictated the system of working to Americans, who were almost entirely inexperienced in this branch of industry, and the consequence is that in the several local codes we can trace not only the Mexican Ordinances, the Spanish Royal Ordinances, but also the Regulations of the Stannary Convocations among the Tin Bounders of Devon and Cornwall, and the High Peak Regulations for the lead mines in Derby. Such has been the origin of the mining rules and regulations now existing throughout the State of California. Springing up from necessity in the early days, they have since been matured by practical experience, made applicable to the wants and requirements of the various districts, by implication recognized by the General Legislature, and adopted by the Courts as rules of law. These regulations are necessarily numerous, as each district has its own laws. Mr. Ross Browne, in his Report to the Secretary of the Treasury upon the "Resources of the United States west of the Rocky Mountains," estimates the number of these districts in the State of California. He thus describes the nature of the regulations:—"There are not less than five hundred mining districts in California, two hundred in Nevada, and one hundred each in Arizona, Idaho, and Oregon, each with its set of written regulations. The main objects of these regulations are to fix the boundaries of the districts, the size of the claims, the manner in which the claims shall be marked and recorded, the amount of work which must be done to secure the title, and the circumstances under which the claims are considered abandoned, and open to occupation by new claimants. The districts," he goes on to say, "usually do not contain more than one hundred square miles, and frequently not more than ten. In lode (quartz) mining, the claims are usually two hundred feet long on the reef; in placers (alluvial), the size depends upon the character of the diggings,

and the amount of labour necessary to open them. In the hill diggings, where the pay dirt is reached by long tunnels, the claim is usually 100 feet wide, and reaches to the middle of the hill. Neglect to work an alluvial claim for ten days (?), in the season when it can be worked, is ordinarily considered an abandonment."

Any lengthened detail of these regulations, numerous as they are, would be simply impossible in a report of this nature, prepared in so limited a time, and therefore necessarily brief; but a short synopsis of the leading points may serve to make obvious the system generally.

(1.) *Meeting of the Miners.*—The meeting was usually held in some known place, upon previous notice that the meeting would take place for the purpose intended, either to establish the laws, or to amend or repeal those already in force. One of the miners acted as chairman, another as secretary, the latter keeping a record of the proceedings of the meeting, and afterwards handing the laws to the elected Recorder, who recorded them in a book kept for that purpose.

(2.) *The Name and Boundaries of the District.*—The name is given to the district as fancy or accident dictates; and the boundaries depend usually upon the formation of the country, the extent of population, and the nature of the diggings.

(3.) *Privilege of the Discoverer.*—The ancient law, and particularly that of Mexico, is preserved in this particular. The discoverer of a quartz reef or "placer" digging is always allowed a double claim, one for settlement and one for discovery. In compliance with general usage, the Act of Congress allows the discoverer a "ledge" or reef 400 feet, instead of 200 to any one settling upon it afterwards.

(4.) *The Number of Claims allowed to one Person.*—Except the discoverer, no one is allowed to take up more than one claim, but usually an unlimited number may be held by purchase, provided the purchase is *bona fide*. After settlement upon a claim, in compliance with the local laws, the claim is property which the owner can sell, and any person can buy, to any extent he pleases. To this, the general law, the mining laws are subordinate, as they are to all general and State laws.

(5.) *Extent of Claim under Mining Law, and how changed by the Law of Congress.*—Generally speaking, claims in gullies run from 100 to 250 feet in length, by 50 to 100 feet wide. Creek claims average about 200 feet in length, and in width extend from bank to bank. Claims on the bars of rivers extend from 2 feet to 10 feet wide by 50 feet long. Tunnelling claims are about 100 feet wide to the man, and run to the centre of the hill. When a Company, for the purpose of prospecting, runs a tunnel into a hill, a double claim is allowed to each of its members. The Act of Congress of 1866 makes no reference to the size of claims on alluvial diggings, but fixes definitely the extent which can be taken up on quartz reefs. The fourth section says:—

"Provided that no location hereafter made shall exceed 200 feet in length along the vein, for each locator, with an additional claim for discovery to the discoverer of the lode (reef), with the right to follow such vein to any depth, with all its dips, variations, and angles, together with a reasonable quantity of surface for the convenient working of the same, as fixed by local rules. And provided further, that no person may make more than one location (take more than one claim) on the same lode, and not more than 3,000 feet shall be taken in any one claim by any association of persons."

(6.) *Posting Notice and Marking the Claim.*—It is required by all these regulations that a miner taking up a claim must write out a notice, setting forth the number of feet claimed in each direction, date this notice, and sign his name thereto. A copy of the notice must then be posted at each corner, or upon some conspicuous place on the claim, and be entered in the Recorder's Book.

(7.) *The Recorder.*—This is the only official connected with the gold fields of the State. He is elected by the miners of the district to serve for a stated period, sometimes a year, sometimes longer, and is required to keep a book wherein is recorded all notices of claims taken up, and transfers of titles, with copies of the notices themselves and of the original deeds. In payment, he gets stated fees from the parties themselves. The book is accessible to every one, properly indexed, and admissible as evidence in the Courts of Law. It is also the duty of the officer to call meetings of the miners when a petition to that effect is presented to him and signed by fifteen or more of them resident within the district.

(8.) *Conditions upon which Claims are held, and how lost.*—The local rules and regulations always provide and specify the time, extent, and nature of work to be done upon a claim in order to hold it. Forfeiture is the result of non-compliance. The whole system of mining is based upon forced work. The claim must be worked by the owner, or it is jumpable. In some districts, a claim may be held for five days only after water can be procured at the usual rates; in others, ten days are allowed. On river and bar diggings the claims may be held unworked from the commencement of the rainy seasons, when the rivers rise, until the dry season, when they fall. In hydraulic workings a prospector who expends in money or labour the sum of 500 dollars secures his claim for two years, by perpetuating his notice. But this compensation rule is more liberally introduced in the working of quartz reefs, with the view of giving prospectors an opportunity of developing the reef by the introduction of capital and machinery. Work to the extent of 100 dollars in value, or twenty days of faithful labour by the owner or owners of a quartz reef claim, guarantees its possession for a year. A contract in good faith for quartz-crushing machinery, to the amount of five thousand dollars, entitles the holder or holders to receive a title-deed from the Recorder, guaranteeing it to him and his successors for ever.

(9.) *Settlement of Disputes.*—Arbitration is the tribunal substituted by the Californian miners for the territorial deputations of Spain and Mexico, the local tribunals like the Stannaries in Cornwall, and the Bermote Courts in Derby. The method of proceeding is this:—Whenever a dispute arises, each party selects a miner in the district to act as arbitrator; and if they are unable to agree, the arbitrators select an umpire, whose decision is final. Sometimes, however, the disputes are referred to a standing committee previously selected by the miners, the members of which try all disputed cases. The foreman is sworn in and he administers to the jury a like oath, to do their duty faithfully and impartially in every case tried before them. Each juror is paid a specified sum whilst occupied in the case, the usual amount being from two to three dollars a day.

I will now pass to the second sub-division of the subject under consideration,—

The Title to Mining Claims.

In nearly all the laws extending the right of pre-emption to settlers upon public lands, mineral lands were reserved from their operation. Indeed, not only was this the case with regard to settlers, but when the land was granted to the State by Congress, this same reservation was made. Digging for minerals, therefore, before the passing of the Act of 1866, was a trespass. But the first section of this Act opens up the public land of the Union to prospecting, and to the use of the claims already occupied, or which might afterwards be taken up—with this restriction, however, that the local laws and customs are to be in force, unless in conflict with the laws of the State. The title conferred by the section is in the nature of a possessory right. It is a license by the Government to go upon the public lands and search for minerals and appropriate them. No other title than this possessory one can be acquired for alluvial claims under the existing law; but in the case of quartz reefs, and mining for silver and copper, provision is made for the purchase of the claim.

The first section of the Act of 1866 is as follows:—"That the mineral lands of the public domain, both surveyed and unsurveyed, are hereby declared to be free and open to exploration and occupation by all citizens of the United States, and those who have declared their intention to become citizens, subject to such regulations as may be prescribed by law, and subject also to the local customs and rules of miners in the several districts, so far as the same may not be in conflict with the laws of the United States." As this Act may be of some advantage for future reference, I have given it at length in the Appendix to this Report, and will here refer further to its second section only:—"And be it further enacted, That whenever any person or association of persons claim a lode or vein of quartz or other rock bearing gold, silver, cinnabar, or copper, having previously occupied and improved the same according to the local customs or rules of miners in the district where the same is situated, and having expended in actual labour and improvements thereon an amount of not less than one thousand dollars, and in regard to whose possession there is no controversy or opposing claim, it shall and may be lawful for said claimant or association of claimants to file in the local Land Office a diagram of the same, so extended laterally or otherwise as to conform to the local laws, customs, and rules of miners, and to enter such tract and receive a patent therefor, granting such mine, together with the right to follow such vein or lode, with its dips, angles, and variations, to any depth, although it may enter the land adjoining, which land adjoining shall be sold subject to this condition."

I have just been informed that there is a Bill now in course of progress through Congress, having for its object the sale of the mineral lands in the several gold-producing States of the Union. The passage of such a measure is very favourably received by the public at large, as a step in the right direction. One of the leading papers of this city, the *Bulletin*, thus comments upon the proposed measure:—"The Bill proposes to encourage permanent settlement in the mining districts, by allowing placer miners to buy the claims they hold, without disparagement to agricultural interests in the same localities. It will operate to prevent disputes and ill-feeling between miners and farmers. It will facilitate the survey of mineral lands, and bring them more rapidly under the provisions of the pre-emption and homestead laws. It has been commended by the press of California, Oregon, Nevada, Utah, and Colorado, and by large public meetings. Nobody can make any money out of it except by working in the soil: can this fact be urged against its passage?"

This brings me to the third and last sub-division—

The Methods of Working Claims.

In using the word claim, I refer now to what is termed "placer claim" in this country; that is, to claims other than quartz claims. In this, as in all other gold-producing countries, mining was at first carried on in the beds of creeks, along their banks, and in the flats and gullies, for the simple reason that in these localities the gold was extracted without much labour or expense. But in the course of time, as these favoured localities became exhausted, the attention of miners was diverted to the deeper sinking on the hills. It was soon found, however, that the machines hitherto used were inapplicable to this new working, and water became the agent used in extracting the precious metal. Then the cradle and long tom gave way to the sluice box, and ground-sluicing on an extensive scale was carried out. The richest deposits being usually found in the bed-rock on these hill diggings, and in the channels of old watercourses, it was found necessary, in order to reach them, that expensive tunnels, in some cases thousands of feet in length, should be constructed for the purpose, as well as for the drainage of the ground, and giving an outlet to the water from the sluice. A large force of water, sometimes as much as 1,500 and 2,000 inches, brought to bear upon the banks, tore them away to within a few feet of the bed-rock, when blasting was had recourse to for the removal of the underlying hard cemented gravel. Several plans are adopted to secure the gold. Sometimes the bed of the sluice is paved with round stones, the gold, when carried down, being retained in the interstices, and washed out every nine or ten days; sometimes blocks of wood are used, sawn across the grain, 2 feet square and 6 inches deep; a 2-inch batten is fastened across these, at a distance of every two feet, along the bottom of the sluice, and in this way the gold is prevented from being washed away; undercurrent sluices are also occasionally used with advantage. The method adopted is this:—A grating of iron bars is constructed at the end of the last sluice-box and through the apertures the very fine gravel and clay and water drop into another set of boxes, more gently graded than the main sluice, and are carried along them, in a different direction. Taking the rate of labour at 8s. a day, the following is, approximately, the cost of removing a cubic foot of deposit:—

	£	s.	d.
With the tin dish	2	0	0
With the cradle	0	10	0
With the long tom	0	2	0
With the sluice	0	0	4

Quartz Mining.

Introductory.—Unlike the placer mining, which, as I have already stated, sprang suddenly into

existence and then rapidly declined, the development of quartz mining has been gradual in the State. It was first started by the Mexicans, who had long previously being engaged in the pursuit in their own country. But their method of working was very crude. They generally pounded up the quartz in mortars, or by making small circular pavements and working a large granite stone, which was pulled around by a mule. The quartz was pulverized between the stone and pavement. At the present time the "Hepburn" machines are generally the best. Mr. Hepburn, the patentee, informed me that through his agent, Mr. Mackay, of the Thames Gold Field, he has applied for a patent for this machine in New Zealand. It crushes about 8 tons of ore a day, and costs, in San Francisco, from 250 to 750 dollars, according to size. As arrangements have been made with an Auckland foundry to produce these machines, doubtless they will be in operation in the Colony very shortly, and any attempt to describe them, on my part, would therefore be useless; I will consequently proceed to give you such information as I have been able to procure as to the statistics of some of the principal quartz mines.

The richest tract of country in the State of California, as far as quartz mining is concerned, is about 200 miles long by 50 wide, and lies between Feather River and latitude 37°. Along this tract for a distance of 100 miles, in a straight line, runs the great outcrop of quartz known in California as the great "Mother Lode," the "Veta Madre" of the Spaniards. Here, too, lie the great "Hayward" mine, the deepest gold mine in the world, and now known as the "Amador," the "Princeton," the "Josephine," the "App," the "Eureka," the Sierra Buttes, and several others, too numerous to mention. Some few years ago Mr. Rèmond, of the State Geological Survey, visited this locality, and the following interesting statistics are taken from his report. The rock examined, in which the quartz was encased, was principally slate, granite, or greenstone:—

Number.	Average Width of Vein.	Cost of Extracting per Ton.	Cost of the Carriage to Mill.	Cost of Milling.	Yield per Ton.	Net Proceeds per Ton.
1	1 ft. 6 in.	3 dols.	1 dol.	1½ dol.	12 dols.	6½ dollars.
2	1 0	...	...	...	10 dols. 60 cents.	5 dols. 10 cents.
3	...	Not running at time of visit.				
4	...	Not running at time of visit.				
5	1 2	14 dols.	1¼ dol.	3 dols.	32 dols.	13¾ dols.
6	2 6	3½	2	3	18	9½
7	1 6	...	...	...	25	16½
8	0 8	...	Not running.			
9	1 0	4 dols.	2½ dols.	2½ dols.	40	31
10	1 6	...	...	...	40	31
11	3 0	4 dols.	1	2 dols.	14	7
12	10 0	1¾	87½ cents.	2	19	14 dols. 6½ cents.
13	2 0	1	1¼ dol.	¾	6	3 dols.
14	1 0	4	2	2	37½	29½
15	10 0	2½	40 cents.	2	12	
16	6 0	3	75	2½	18	11¾
17	1 6	2	50	6	27½	19
18	2 6	2	50	6	25	16½
19	4 0	4	None.	2¾	14	7¼
20	3 0	2½	50 cents.	2½	15	9½
21	7 0	4	50	6	17½	7
22	2 6	3	50	1	60	55½
23	1 0	9½	50	3½	25	11½
24	4 6	4¼	50	2¾	40	32½
25	9 0	2	25	1¾	6	2

"*Amador*" *Mine.*—This celebrated mine, the deepest quartz mine in the world, is situated at Sutter Creek, Amador County, and on the great "Mother Lode." It is better known, however, by the name of its former proprietor, Mr. Hayward, who, in March 1867, sold it to the "Amador Company," for the sum of 750,000 dollars. This company commenced operations in October 1867, and the dividends since declared, up to December 1869, have amounted to 720,000 dollars; viz., for 1868, 340,000 dollars, and for 1869, 384,000 dollars. It has been worked since 1852, and it is estimated to have yielded eight millions of dollars, but there is no trustworthy data upon this head to be had, for until its sale by Mr. Hayward no statistics were published. Except one shaft, the mine is at present unworked, in consequence of having caught fire. The depths of the shafts are—

The Panama Shaft	1,300 feet.
The San Francisco	1,200 feet.
The Latrobe	844 feet.

The average width of the vein is 12 feet, and the dip 75° E. The ground, at the mouth of the claim, is 900 feet above the level of the sea, and consequently the deepest is 400 feet below sea-level.

The following particulars are taken from the reports of the Directors:—

STATEMENT OF THE "AMADOR" OR "HAYWARD" MINE.

Date.	No. of Tons of Quartz Crushed.	Cost of Extracting per Ton.	Cost of Crushing per Ton.	Gross Yield per Ton.	Net Yield per Ton.
1868	30,794	4 dols. 67 cents.	2 dols. 30 cents.	21 dols. 56 cents.	14 dols. 59 cents.
1869	32,500	4 86	1 97	20 18	14 25

NOTE.—There are between 60 and 70 men employed on this Claim, or rather were at the time of the accident.

Following the great lode, we come to Grass Valley, in Nevada County, the richest and most prosperous quartz-mining region in California. It is computed that this district has produced from twenty-seven to thirty millions of dollars from its mines. The veins in the districts are very narrow, some of them not exceeding a foot in width, and the bed rock is mostly greenstone and slate. In this district lies the "Eureka," the richest claim in this State. The vein varies in width from three to four feet, and is encased in a hard metamorphic rock. When this vein was first worked, and down to 30 feet, the yield of quartz was from 6 to 12 dollars a ton; at 100 feet depth, it paid at the rate of 28 dollars a ton; at 200 feet, 37 dollars; and at 300 feet, 60 dollars a ton. The average yield for the past year has not been so high. There are 170 men engaged on the works, the average wages being about 3 dollars a day. The chlorinization works of the "Eureka" are the most perfect in the State, the manager, Mr. Deetkin, having been the first who introduced the process into California. The following statement was presented to me by the Secretary:—

STATEMENT OF THE "EUREKA" MINE.

Date.	No. of Tons of Quartz Crushed.	Cost of Extracting per Ton.	Cost of Crushing per Ton.	Gross Yield per Ton.	Net Yield per Ton.	Depth each Year.
1867						
1868	15,944	Extracting and Cr	ush. 12 dls. 44 c.	30 dols. 36 cents.	17 dols. 92 cents.	
1869	20,638	6 dols. 80 cents.	2 dols. 85 cents.	27 80	18 80	

It is very difficult to give any general estimate of the cost of working quartz reefs: indeed it is impossible to do so with any degree of accuracy; but I hope the statistics upon this subject, already given, may help to throw some light upon it. Extracting the quartz from the reef, and crushing it afterwards, form the two items in working the ore. The first of these items depends entirely upon local circumstances—upon the hardness of the vein, upon the hardness of the rock in which the vein is encased, the depth of working, the amount of water in the mine, and such like. The consequence is, that owing to these varying circumstances, the expense of extracting the ore, in some cases, does not exceed 2 dollars a ton, whilst in others it reaches as high as 25 dollars. As a general rule, however, when the vein is say from five to six feet wide, the expense of extracting the ore averages 5 dollars a ton.

Professor Ashburner, of the State Geological Department, reports upon twenty-eight mines, and gives the following statistics:—"In eight of the mines visited the cost of extracting the quartz is between 2 and 3 dollars. In four mines it is 3 dollars, and less than 4 per ton. In two it is 4 and less than 5 dollars; in five mines it is 5 dollars and less than 6; in two mines it is less than 2 dollars; in three it is between 7 and 14 dollars; in one mine it is 15 dollars; and in one 26 dollars." With regard to milling, however, there is more certainty. The following estimate has been given to me by a reliable authority:—

In quartz mills with water grants attached ...	1 dollar 10 cents	per 2000 lbs.
In quartz mills when water is purchased ...	1½ dollar	„ „
In steam quartz mills	2 dollars	„ „

Extraction of Gold from Tailings.

The direct method of attacking ores is by fire, but the plan used now-a-days is by amalgamation, the pan process being the most effective gold manipulator now known. This process of amalgamation is, however, too well understood to need any description at my hands. But after the pulp passes through the amalgamator it is found that certain impurities, known in the Colonies as "mundic" and in this country as "sulphurets," chill the mercury, preventing its taking hold of the small particles, and in this way a large percentage of the gold, estimated in California at from 30 to 35 per cent. of the entire production, is lost. Several plans have been tried to extract the gold from these impurities, but, except the chlorinization process, all others have failed. This process is now used throughout the country with signal success; and, briefly stated, is the application of chlorine gas to the ore previously roasted in a furnace. The sulphurets are roasted for about twenty hours in this furnace at a red-hot heat, and the tailings are then allowed to cool, when they are sprinkled with water and shovelled over. In this wet state, they are put into wooden tubs with false bottoms, perforated, which permits the chlorine gas to ascend and penetrate the entire mass. The tubs are closely covered, and chloride of gold is formed. Water is next poured in, the chloride of gold dissolved, and a solution formed, which is drawn off into glass vessels, when, by the addition of sulphate of iron, the gold is precipitated in a metallic condition as a powder. To carry out this process, two requirements are necessary:—1st, the gold must be in a metallic state; and 2nd, the chlorine gas must be freed from muriatic gas. In carrying out the process, the tailings are, as already stated, subjected to the following operations:—

1st. Roasting.
2nd. Impregnation of roasted ore with chlorine gas.
3rd. Filtration of soluble parts by cold water.
4th. Precipitation of the gold by sulphate of iron.

The roasting is the most important point in the whole operation, care being taken that the "mundic" is stirred frequently, until the roasting is finished and the "sulphurets" decomposed. If the ore is dry, it must first be sprinkled over with water; but if it consists of fine wet tailings, it must be dried in the sun or air, and then run through a sieve, otherwise it would probably be roasted into a hard lump. The ore is kept in the furnace from sixteen to twenty-four hours, and until all sulphurous smell has disappeared; charcoal being of use as a final test. If the blue flame disappears when the charcoal is thrown in, the ore is considered to be properly roasted. The roasted ore is next removed from the furnace, and several tons are spread out in a place prepared for the purpose, made of thin boiler-iron, 10 feet square and 2 feet high. Here it is moistened by a hose, until a handful forms a lump

when held, but crumbles away when loosened, in which state the chlorine acts better upon it. It is then placed in the chlorinization vats. These vats are generally made circular, being 7 feet in diameter, and capable of holding three tons of ore each. They have each of them a false bottom, perforated with auger holes, one inch above the true bottom, and it is covered with a layer of quartz, then a layer of finer quartz, and finally a layer of sand, the three layers being 5 inches in depth, and serving as a filter, upon which the roasted and moistened ore is placed. The space below the false bottom is communicated with by two holes. Into one of them passes a leaden pipe, attached also to the generator and conveying the chlorine gas from it; to the other a cock is attached for the discharge of the solution. The chlorine gas itself, conveyed in the manner just stated to the vat, is thus formed:—For every three tons of ore there is used—

30 lbs. of pulverized manganese.
30 or 40 lbs. of common salt.
75 lbs. of sulphuric acid.
45 lbs. of water.

The gas, before entering the false bottom of the vat, passes through a water purifier, entering at the bottom and ascending to the top of the water, which absorbs the muriatic gas or acid. About six hours must pass, from the time the chlorine gas enters the vat until it reaches the top of the charge, and the operation is usually permitted to continue twelve or fourteen hours. The covering of the vat is now removed, and water poured in until the charge is covered, when the cock at the bottom of the vat is opened, and the solution run off into a trough, whence it is conveyed into what is termed the precipitating tub, a circular sort of vat 4 feet in diameter, and 3 feet high. The precipitation, a solution of sulphate of iron known as "copperas," having been previously prepared by putting 60 lbs. of old wrought iron into five or six buckets of water, and 20 lbs. or 30 lbs. of sulphuric acid, is thrown into the precipitating vat in such quantities as are required. The mixture generally stands undisturbed over night, and in the morning the liquid is carefully drained off, after which the gold is introduced into a filter and then dried in an iron vessel.

The average cost of the chlorinization process, thus imperfectly described, is 15 dollars a ton.

Published Plans of Mines and Mining Machinery.

My efforts to procure plans have been unsuccessful. These plans are only prepared by private companies for the benefit of the shareholders or owners of the different mines, and are therefore unprocurable, unless specially drawn by some mining engineer; but as this is a very expensive proceeding, I do not feel justified in incurring so heavy an outlay, the doing so being outside the scope of my instructions. I have, however, obtained a plan of the Lutro Tunnel, a topographical map of the great "Cornstock lode," and Mr. Raymond's work on "The Mines of the West," which contains some profile sketches of a few of the principal mines. These, together with some other works of interest, accompany this report.

III.—*Concluding Remarks.*

Perhaps it may not be out of place, before drawing to a close this Report upon those branches of mining submitted to me, to say a word or two as to the present condition of mining throughout the State of California generally, and also in reference to one or two points I have not yet touched upon and should not care to pass over in silence. For upwards of twenty-two years, this great industry of mining has been followed in California, and subjected to the various ups and downs which, as a rule, appertain to it elsewhere. During those twenty-two years, in round numbers, the enormous sum of one billion of dollars' worth of the precious metal has been extracted from the earth, being an average of 45,000,000 of dollars annually, or, say £9,000,000 sterling. The maximum production was in the year 1853, when it averaged 65,000,000 of dollars; since when there has been a gradual decline in the returns, which in the past year (1869) amounted only to 23,000,000 of dollars. This latter sum, however, does not include any portion of the receipts from the neighbouring States and Territories, amounting to about 250,000,000 of dollars for the gold and silver produced; but the same remarks, as to the decline of production, apply to these also. The total decline in the production of gold and silver throughout the several Pacific States for the year 1869, as compared with 1868, is estimated at eight millions of dollars.

Giant Powder.—The use of giant powder, as an explosive, is now largely tried instead of the common powder: it is found more powerful and economical, especially in the removal of hard rock, the saving effected being calculated to exceed 35 per cent. It is also said to possess the additional merit of being usable with greater safety than the common powder. Mr. Cassalls, manager of the Hunter Valley Mine, has made some experiments with regard to its employment, which are referred to in Mr. Raymond's report. He found that the drilling of 105 feet of rock for the common powder cost 92 cents the foot, whilst the drilling for the giant powder costs only 51 cents a foot. The saving effected is principally in the drilling—the former explosive requiring an inch and a half hole, the latter requiring one an inch in diameter only. Two men will do 200 inches of the smaller hole required for the giant powder in the same time that it takes them to drill 84 inches of the larger-sized hole. Its action also is more powerful, and, unlike the common powder, the giant "tears to the very bottom, never seeking an outlet by the least resisting portion of the surrounding surface."

Value of Gold in San Francisco and London.

My attention having been directed to this point by some eminent assayers in San Francisco, who state that the value of gold is relatively more in this city than in England, I considered the matter worth looking into, and I herewith present the result of my researches in figures. Before doing so, however, a word or two of explanation is necessary. The standard value of gold in the United States is 900—that is to say, in every 1,000 oz. or 1,000 parts of gold, 900 of it is pure. In England the pure gold is 24 carats fine or 96 grains, and the standard 22 carats or 88 grains. Reduced to the United States decimal system, this would make the English standard gold as equivalent to $916\frac{2}{3}$. Again, the charge for refining gold in San Francisco is 8 cents the oz., and now this includes coinage

also, whereas in London these charges amount to 12 cents the oz. Taking, then, as a basis for calculation, 100 oz. of gold 900 fine, the following would be its value in San Francisco :—

	Dols.	cts.
100 oz. gold, 900 fine, at 18 dollars 60·46 cents per oz.	1,860	46
9 oz. silver ditto, less amount retained in the gold as alloy, being ·909, giving 8·09 oz. of silver at 1 dollar 29·29 cents	10	46
4 per cent. premium on the silver	0	42
Gross value of 100 oz. gold in San Francisco	1,871	34
Deduct for refining &c. 8 cents per oz.	8	00
Net value of 100 oz. gold in San Francisco	1,863	34

In London 100 oz. contain—	Dols.	cts.
90 oz. standard gold at 77s. 10d., or 18 dollars 93·87 cents ...	1,859	42
9 oz. fine silver at 5s. 6d.	12	04
Gross value of 100 oz. gold in London	1,871	46
Deduct for refining, &c., 12 cents per oz.	12	00
Net value of 100 oz. in London	1,859	46

APPENDIX.

COPY OF AN ACT INTITULED

"An Act to legalize the Occupation of Mineral Lands, and for other Purposes."

1. That the mineral lands of the public domain, both surveyed and unsurveyed, are hereby declared to be free and open to exploration and occupation, by all citizens of the United States and those who have declared their intention to become citizens, subject to such regulations as may be prescribed by law, and subject also to local custom or rules of miners in the several mining districts, so far as the same may not be in conflict with the laws of the United States.

2. And be it further enacted, that whenever any person or association of persons claim a vein or lode of quartz, or other rock in place, bearing gold, silver, cinnabar, or copper, having previously occupied and improved the same according to the local custom or rules of miners in the district where the same is situated, and having expended in actual labour and improvements thereon an amount not less than one thousand dollars, and in regard to whose possession there is no controversy or opposing claim, it shall and may be lawful for said claimant or association of claimants, to file in the local Land Office a diagram of the same, so extended laterally or otherwise as to conform to the local laws, customs, and rules of miners, and to enter such tract and receive a patent therefor, granting such mine, together with the right to follow such vein or lode, with its dips, angles, and variations, to any depth, although it may enter the land adjoining, which land adjoining shall be sold subject to this condition.

3. And be it further enacted, that upon the filing of the diagram as provided in the second section of this Act, and posting the same in a conspicuous place on the claim, together with a notice of intention to apply for a patent, the Registrar of the Land Office shall publish a notice of the same in a newspaper published nearest to the location of said claim, and shall also post such notice in his office for the period of ninety days; and after the expiration of said period, if no adverse claim shall have been filed, it shall be the duty of the Surveyor-General, upon application of the party, to survey the premises and make a plat thereof, indorsed with his approval, designating the number and description of the location, the value of the labour and improvements, and the character of the vein exposed; and upon the payment to the proper officer of five dollars per acre, together with the cost of such survey, plat, and notice, and giving satisfactory evidence that said diagram and notice have been posted on the claim during said period of ninety days, the Registrar of the Land Office shall transmit to the General Land Office said plat, survey, and description; and a patent shall issue for the same thereupon. But said plat, survey, or description shall in no case cover more than one vein or lode, and no patent shall issue for more than one vein or lode, which shall be expressed in the patent issued.

4. And be it further enacted, that when such location and entry of a mine shall be upon unsurveyed lands, it shall and may be lawful after the extension thereto of the public surveys, to adjust the surveys to the limits of the premises according to the location and possession and plat aforesaid, and the Surveyor-General may, in extending the surveys vary the same from a rectangular form to suit the circumstances of the country, and the local rules, laws, and customs of miners: Provided that no location hereafter made shall exceed two hundred feet in length along the vein for each locator, with an additional claim for discovery to the discoverers of the lode, with the right to follow such vein to any depth, with all its dips, variations and angles, together with a reasonable quantity of surface for the convenient working of the same, as fixed by local rules: And provided further, that no person may make more than one location on the same lode, and not more than three thousand feet shall be taken in any one claim by any association of persons.

5. And be it further enacted, that as a further condition of sale, in the absence of necessary legislation by Congress, the local Legislature of any State or Territory may provide rules for working mines involving easements, drainage, and other necessary means to their complete development, and those conditions shall be fully expressed in the patent.

6. And be it further enacted, that whenever any adverse claimants to any mine located and claimed as aforesaid shall appear before the approval of the survey, as provided in the third section of this Act, all proceedings shall be stayed until a final settlement and adjudication in the Courts of competent jurisdiction of the rights of possession to such claim, when a patent may issue as in other cases.

7. And be it further enacted, that the President of the United States be and is hereby authorized to establish additional land districts, and to appoint the necessary officers under existing laws, wherever he may deem the same necessary for the public convenience in executing the provisions of this Act.

8. And be it further enacted, that the right of way for the construction of highways over public lands, not reserved for public uses, is hereby granted.

9. And be it further enacted, that whenever, by priority of possession, rights to the use of water for mining, agricultural, manufacturing, or other purposes have vested and accrued, and the same are recognized and acknowledged by the local customs, laws, and the decisions of Courts, the possessors and owners of such vested rights shall be maintained and protected in the same; and the right of way for the construction of ditches and canals for the purposes aforesaid is hereby acknowledged and confirmed: Provided, however, that whenever, after the passage of this Act, any person or persons shall, in the construction of any ditch or canal, injure or damage the possession of any settler on the public domain, the party committing such injury or damage shall be liable to the party injured for such injury or damage.

10. And be it further enacted, that wherever, prior to the passage of this Act upon the lands heretofore designated as mineral lands, which have been excluded from survey and sale, there have been homesteads made by citizens of the United States, or persons who have declared their intention to become citizens, which homesteads have been made, improved and used for agricultural purposes, and upon which there have been no valuable mines of gold, silver, cinnabar, or copper discovered, and which are properly agricultural lands, the said settlers or owners of such homesteads shall have a right of pre-emption thereto, and shall be entitled to purchase the same at the price of one dollar and twenty-five cents per acre, and in quantity not to exceed one hundred and sixty acres; or such parties may avail themselves of the provisions of the Act of Congress, approved May 20, 1862, entitled "An Act to secure Homesteads to actual Settlers on the Public Domain," and Acts amendatory thereof.

11. And be it further enacted, that upon the survey of the lands aforesaid, the Secretary of the Interior may designate and set apart such portions of the said lands as are clearly agricultural lands, which lands shall thereafter be subject to pre-emption and sale as other public lands of the United States, and subject to all the laws and regulations applicable to the same.