

THE 4
MINING LAWS
OF

OREGON. *Laws, statutes, &c.*
= Mining law

INCLUDES ALL THE LATE MINING LAWS ENACTED BY THE 21ST
REGULAR SESSION OF THE LEGISLATIVE ASSEMBLY; ALSO
COMPRISING THE GENERAL PROVISIONS OF THE FEDERAL
STATUTES, THE DECISIONS OF THE COURTS AND OF
THE GENERAL LAND OFFICE TOUCHING MINES,
MINING AND WATER RIGHTS; WITH
FORMS FOR LOCATING, BONDING, ETC.
NAMING OF ROCKS, GAME AND
FISH LAWS, AND MUCH
USEFUL INFORMATION, ETC.

SECOND EDITION.

A Book Useful to the Locator, Prospector and Mine-Owner.

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ERRATA—On page 10, the 15th line
from the top, the word "thirty" should
read "sixty."

MINING LAWS of OREGON

**Embracing a Digest of the Federal and State Statutes
on the Subject.**

The congressional acts of July, 1866, and July, 1870, throw open to exploration and purchase by any citizen of the United States, or one who has declared his intention to become such, all mineral lands lying in the public domain.

This right gives to a locator the exclusive possession and enjoyment of all the surface ground included within the lines of the claim, and he is not limited to the necessary use of the ground for mining purposes.

A Mining Claim as Property.

The general doctrine is that a mining claim, before as well as after patent, is real property and has in the matter of sale, seizure on execution and attachment, redemption, etc., all the characteristics of that class of property.

What Land May Be Located.

Only the unoccupied and unappropriated mineral lands of the United

States are open to exploration and purchase.

When a location has once been made, the ground covered thereby is not public mineral land, and no one can make another location thereon so long as the first location is a subsisting one—not even the first locator himself. But ground does not cease to be unoccupied, within the meaning of the acts of congress, when it is simply taken possession of by a party who does not proceed to comply with the requirements of the law relating to locations. In other words, mere occupancy of the public lands and making

improvements thereon, or working them for ore, gives to the occupier no vested right as against one complying with the laws as to locating mineral lands. The right of possession comes only from a valid location, and mining ground cannot be held by possession alone against a valid location. It is equally so if the location has become forfeited by non-compliance with the provisions as to assessment work.

It has been held, however, in some cases, that as to lands, or a shaft, or a tunnel, actually held by a discoverer, no one can, by a later discovery, assert a superior title, even though the former has failed to comply with the law.

TIME TO PERFECT CLAIM.—The Oregon statute gives 60 days in which the locator must perfect his location.

HOW SUBJECT TO ENTRY.—Mineral lands are not subject to entry under the homestead acts, nor can title to land known at the time to be valuable for its minerals be obtained under any law except those especially pertaining to mineral lands, and a patent issued to such lands is void. If a patent issues for agricultural lands on which there is a known lode, title to such lode does not pass by the patent. Nor does the failure of the government surveyor to segregate such mineral land operate to defeat the rights of one who has located the lode as a mining claim. The same rule applies where there is a placer on the land patented. But if the mineral deposits are discovered after the patent issues, they pass with the patent.

What Are Mineral Lands.

It is held by the general land office that whatever is recognized as a mineral by the standard authorities, where the same is found in quantity and quality to render the land sought to be held under the mining laws more valuable, on this account, than for agricultural purposes, falls within the provision of the mining acts. Lands in which minerals are found, but not in such quantity as to justify expenditure in the effort to extract them, are not mineral in the sense of the statute.

LANDS WITHIN THE O. & C. GRANT.—The grant to the O. & C. R. Co. specially excludes from its operation all mineral lands, and such lands before, at least, the listing of the same by the company for patent are open to exploration and purchase under the mining laws to the same extent as if beyond the territorial limits of the grant. As to the status of such lands, however, after patent there is some difference of opinion. The patents to the company now being issued expressly exclude all mineral lands therein mentioned, "should any such be found." The construction generally given to this clause is that it applies only to such lands as were known to be more valuable for minerals than for other purposes at the date of the listing of the lands for patent, or perhaps, at the time of the delivery of the patent, and not to lands in which valuable minerals might be subsequently discovered. This construction would exclude from the patent all the valuable mineral lands described therein

which were covered at the date of the listing for patent by a valid subsisting location—and this irrespective of any proceedings taken before patent in protest of its issuance.

SCHOOL LANDS.—Sections 16 and 36 in each township are denominated school sections, and the title to the same, even, where mineral land, vested in the state at the time of the approval of the government survey, if the mineral character was not then known. These lands have generally been certified to the states in all cases where the public surveys have been extended over them. It follows, therefore, that such lands, except in the contingency above mentioned, are not open to exploration and purchase under the mining acts, but that title thereto must be secured by purchase from the state. Where the surveys have not been extended, such lands are open to exploration as other portions of the public domain.

Who May Locate Mineral Lands.

Only a citizen, or one who has declared his intention to become such can make a valid location. A corporation organized under the laws of any state or territory is such a citizen and may make such location.

A minor may make such location. So, also, may a woman, married or single.

Every locator is presumed to be a citizen until the contrary is shown in a proper proceeding.

ALIENS AS LOCATORS.—Where an alien locator declares his intention to become a citizen before any ad-

verse rights attach, his claim will relate back to the date of his discovery. If an alien convey his claim to a citizen before adverse rights attach, such citizen will acquire a valid right from the date of the conveyance. If one or more of several locators are citizens, the claim is good as to such as are citizens, though some of the others are aliens.

Placer and Quartz Locations.

The statute defines a placer to be any form of deposit except veins of quartz or other rock in place. It is otherwise defined to be "ground containing mineral in its earth, sand or gravel; ground that includes valuable deposits not in place, but which are in a loose state and may in most cases be collected by washing or amalgamation, without milling."

A deposit of gold-bearing gravel, though it lies between clearly defined strata of rock, is nevertheless a placer and not a lode.

A lode or vein, within the meaning of the acts of congress, is applicable to any zone or belt of mineralized rock lying within boundaries clearly separating it from the neighboring rock.

SIZE OF CLAIMS.—No placer claim can exceed 160 acres, and no one individual can locate more than 20 acres, though he may locate less. It requires eight individuals to lawfully locate 160 acres; two to locate 40 acres; three to locate 60 acres, etc. Quartz claims are now limited by both the federal and state statutes to an area not to exceed 1,500 feet in length and 300 feet in width on each side of the mid-

at each corner and at the center ends of such claim.

THE RECORD.—Both the federal and state statutes provide for the recording of a certificate of the location of the claim. On this point the federal statute provides that the recorded certificate of location "shall contain the name or names of the locators, the date of the location and such description of the claim located by reference to some natural object or permanent monument as will identify the claim." The Oregon statute provides that before the expiration of said thirty days (from the date of posting the notice) he or they (the locator or locators) shall cause the claim or claims to be recorded, describing as near as may be the claim or claims and their location. But continuous working of the claim dispenses with the necessity of such record. But this applies only to quartz claims.

THE DESCRIPTION.—When the description of a claim is so vague that it affords no notice to a party making a subsequent entry, the first location is void.

It is only necessary that the claim should be identified with reasonable certainty, and so long as this can be done an erroneous addition will not vitiate it. An erroneous statement as to the quarter section in which the claim lies will not invalidate the claim if the remaining portions of the description sufficiently identify the ground. A description of a location by connecting it with another is not sufficient unless the location of the latter is accurate.

What is a sufficient "natural object or permanent monument" is, in case of dispute, a question for a jury to determine. Such natural object or permanent monument is not required to be on the ground located, though they may be. The "natural object" may consist of any fixed natural object. The "permanent monument" may consist of a permanent post or stake firmly planted in the ground, or of a shaft sunk in the ground. A tree readily distinguishable is a proper "natural object." A reference to the corner of another claim, upon which corner there is a monument of a durable character, is sufficient.

THE PURPOSE OF THE CERTIFICATE.—The purpose of a certificate of location is two-fold: First, when duly recorded it becomes notice to the world of the facts required to be therein set forth, and it is thus constructive notice of the claimant's possession; and, second, its execution and recording is made one of the steps requisite to a perfect mining location. Technical accuracy in the execution of the certificate is not required.

LOCATION OF PLACER CLAIMS.—Of course, no discovery shaft is required, but the statute implies that mineral shall have been found before the right to locate upon the same, as a placer claim, accrues, and the land office has lately held that a separate discovery is required on each 20 acres where the ground has been taken up by an association.

The federal statute provides that such claims, if made on surveyed lands, must be located so as to conform to the public surveys as near as

practicable; but that where they cannot be so made, a survey and plat may be made as on unsurveyed land. Construing this provision, the land office has held that a placer claim should embrace legal subdivisions where the same can be done without interference with the rights of other claimants in the same tract. However, this provision is generally disregarded in the location of placer claims as impracticable, and it is apparently one that can be so disregarded without loss of any right. But whether observed or not, it is settled that the claim should, nevertheless, as in case of quartz locations, "be so marked on the ground that its boundaries can be readily traced."

A placer location confers no title to any lode within the boundaries of the claim; nor will, even, a patent confer such title where the lode was known to exist prior to the application for patent.

TUNNEL LOCATIONS.—The federal statute provides that any one running a tunnel for the development of a vein or for the discovery of mines shall have the same right of possession of all veins or lodes on the line of such tunnel, within 3,000 feet of the face thereof, which shall be discovered in such tunnel and which were not previously known to exist as if the discovery were made from the surface. If other parties shall, while such tunnel is being prosecuted with reasonable diligence, locate on the line of such tunnel any vein not appearing on the surface, such location shall be invalid. A failure for six months to prosecute work on the tunnel constitutes an abandonment of all undis-

covered veins on the line thereof. Construing this statute, it has been held that the line of tunnel "means the width thereof and no more." It has also been held that the object of this provision is to give the proprietors of a mining tunnel the possessory right to 1,500 feet of any and all blind lodes, cut, discovered or intersected by such tunnel, not previously known to exist, within 3,000 feet of the face of the tunnel and to prohibit other parties from prospecting for and making locations on the line thereof and within said 3,000 feet, unless such lodes appear on the surface or were previously known to exist.

AMENDING NOTICE AND CERTIFICATE.—No change of location nor amendment of the certificate or record can be made after the rights of third parties have intervened.

ABANDONMENT AND FORFEITURE.—The question of abandonment is principally one of intention, i. e., whether the ground was left by the locator without any intention of returning and making a further use of it.

Ordinarily, mere lapse of time does not constitute an abandonment, but it may be evidence of abandonment. Mere failure to do work, while it may cause a forfeiture, does not constitute an abandonment. Forfeiture means the loss of a previously acquired right to mine certain ground by a failure to perform certain acts or observe certain rules, and it differs from abandonment in that it involves no question of intention.

A failure to perform the annual work required by statute works a forfeiture of the mining claim, and the

same becomes open to re-location, unless the original locators, their heirs, assigns or legal representatives, resume work upon such claim before a re-location has been made.

Where one tenant in common relies upon his co-tenant to do the assessment work and the latter fails to do it, the former forfeits his interest.

Mining ground which becomes forfeited is relegated to the condition of unappropriated mineral land of the United States. But there can be no forfeiture until some other party has entered and re-located.

If a re-locator has, after forfeiture, entered for the purpose of making a re-location, it is then too late for the first locator to resume work, even though the re-location is not then complete.

A re-location is made in the same manner as an original location, and it is an admission of the validity of the original claim, and also a claim of forfeiture as to the original locator.

ANNUAL WORK.—The federal statute provides that during each year, until a patent issues, not less than \$100 worth of labor shall be performed or improvements made on each claim. But where claims are held in common such expenditure may be made on any one claim. If a tunnel is run for the purpose of developing a lode or lodes, the running of such tunnel shall dispense with the necessity of performing work on the surface.

It will be observed that the provisions of the Oregon statute apply only to lode claims, but the federal provisions are substantially identical with the Oregon statute and provide not only that the work should be done on

placer as well as lode claims, but permit all of the work to be done on one claim, whether lode or placer.

The work done or improvements made must be within the claim, or, if off of it, as a necessary means of extracting the metals it may contain. Working on adjoining land to construct a drain to enable the owners to work the claim is sufficient. Any work done for the purpose of discovering minerals is improvements within the meaning of the statute. Road or trail building may count as annual labor. Flumes, drains, or the turning of a stream will so count. The time and labor of a watchman has been held sufficient. However, traveling expenses in getting ready to go to work will not be considered as sufficient.

To allow work done on one to count on another the claims must be contiguous, and the expenditure of money or labor on this one must equal in value that which would be required on all the claims if they were separate or independent. The work or expenditure, too, must be for the purpose of developing all the claims. An expenditure upon one claim which has no reference to the development of the others will not answer.

WHEN THE WORK MUST BE DONE.—The period within which the annual work is required to be done begins on the first day of January succeeding the date of the location. If done prior to that date it is unnecessary and will not count for the succeeding year.

Work performed by any one of the parties in interest is available to preserve the claim. In determining the value of labor performed or improve-

ments made the measure of value is the market price of the same. This value cannot be determined arbitrarily.

Threats of personal violence may, in some instances, excuse non-performance of labor. The necessity of making the annual expenditure does not cease with the application for patent. The entry at the land office alone terminates the necessity.

PRIORITY.—Priority of location confers the better title. Where veins intersect or cross each other the prior locator is entitled to all ore or mineral contained within the space of intersection, the subsequent locator being entitled to the right of way through said space. When two or more veins unite, the oldest location takes the vein below the point of union, including all the space of intersection.

THE APEX RULE.—One who has made a location in compliance with law is entitled, so long as he complies with the law, to all the veins, lodes or ledges throughout their entire depth, the top or apex of which lies inside of the surface lines of the claim extended downward vertically, although such veins, lodes or ledges may so far depart from a perpendicular in their downward course as to extend outside of the side lines of the location; but such right does not extend outside the end lines of the location projected in their own direction till they intersect the veins or ledges.

The right to follow the vein into adjoining land gives the locator no right to enter upon the surface of such adjoining claim. The same is true as to

an older title under an agricultural patent.

The top or apex is the end, or edge, or terminal point of the lode nearest the surface of the earth.

When the location is made crosswise of the vein the side lines are to be considered as the end lines. This will make the claim a parallelogram six hundred feet each way.

FORFEITURE TO CO-OWNER.—

Upon the failure of any one of several co-owners to contribute his proportion of the annual expenditure, the owners who have performed the labor or made the improvements, may at the expiration of the year give such delinquent co-owner personal notice in writing or notice by publication in the newspaper published nearest the claim for at least once a week for ninety days, and if at the expiration of ninety days after such notice in writing or by publication, such delinquent should fail or refuse to contribute his proportion of the expenditure, his interest in the claim becomes the property of his co-owners who have made the required expenditures.

Although one co-owner has expended more than enough to hold the claim, the delinquent co-owner to save forfeiture under the act of congress is only required to pay or tender his proportion of the amount which the law required to be expended upon the claim. The recovery of his proportion of additional expenditures depends upon other grounds and is to be enforced only by judicial proceedings involving the question of mining partnership, or the expressed or implied assent of the co-owner to the expenditure of the additional amount.

CONGRESSIONAL ACTS OF 1866-
 72. Under the first act of congress passed in 1866, conferring on citizens the right to mine on the public mineral lands, no single locator could claim more than two hundred feet on the same vein, unless he was the discoverer, in which case he might claim four hundred feet on the vein. The existing statute of May 10, 1872, changed this by providing that no claims located after that date should exceed 1500 feet along the vein, nor 300 feet on each side of the vein at the surface. The middle of the vein, under this statute, must be ascertained by actual exploration, or the discovery shaft must be taken as the middle. A locator can not take 200 feet on one side of the vein and 400 on the other. But he may take 300 on one side and less than 300 on the other.

The act of may 10, 1872, provides that locator should have the exclusive right of all the surface included within the lines of the location together with all the veins throughout their entire depth, the top or apex of which should lie inside of such surface lines extended vertically downward. The object of this act was to give the locator the lode discovered with the adjacent surface ground for a certain distance on each side thereof, and to avoid questions of the identity of the vein to give him in addition thereto all other veins within such lines.

Mill Sites.

Mill sites are located by posting notice and staking by a substantial post or stake at each angle, which ordinary prudence would require to be inscribed with the name of the mill site and the number of the corner. There are

neither federal nor state regulations of the details of such location—indeed this is a subject probably beyond the power of the state—but their record should conform to the requirements applicable to the records of all classes of claims, that is, it should contain a sufficient description by reference to natural objects or permanent monuments. In other words, it should contain a description sufficient to identify the claim.

The federal statute provides for two classes of mill-site locations. The first class provides a method of securing surface ground for any mining use incidental to the working of the mine. The second class provides a method of securing ground to be actually used for milling or reduction purposes. In the first class, the locator must be the owner of a lode claim, and the ground must be non-mineral and non-contiguous to the claim. In the second class the locator need not be the owner of a lode claim, but the ground must be non-mineral. In each case the location is limited to five acres.

Ditches and Water Rights.

A MINING USE.—The building on the land of a pumping plant to carry water to the land is a sufficient mining use, or storing water for the same; or for storing ores; or for tallings, shops, or houses for workmen. But the location must be for the benefit of the particular lode in question. Such mill-site may be embraced in an application for a patent to the lode.

The right of the miner to divert water on the public domain from its natural stream, was granted by the

congressional act of 1866 and has been repeatedly confirmed by the decisions of the highest courts.

These decisions further recognize the right of "appropriation" as a necessity in placer mining districts.

The rule is that the person who first appropriates the water for mining purposes obtains the right both as to parties who attempt to take it by tapping the stream above or need it on the stream below.

A homestead claim is subject to the rights of a prior appropriator of the water. When ditch crosses ditch the latter claimant must adjust the crossings so as not to interfere with the full use of the prior ditch.

The change of locality where the water is used does not forfeit the right. The appropriator may change either the point of diversion or the place of use. If he has a prior right to the water he may take it to his ground by a new and different ditch. Where he has appropriated the water for the purpose of working particular mining claims, when these have been worked out he may extend his ditch and work other claims, or use the water for a different purpose. He may use the bed of a natural stream as his means of conducting water added to it by a ditch, without being considered as abandoning the water by mingling it with the original waters of the stream. Still his prior appropriation does not give him the exclusive use of the bed of the stream for such purpose.

After the water has been used it may be abandoned; it then becomes again subject to be appropriated by others.

When it has been appropriated for

use upon a mining claim it must, after having served its purpose upon such claim, be discharged therefrom for the use of owners of claims below, subject only to the reasonable diminution and deterioration by its necessary use on the first claim.

The appropriation of water is perfected only by a diversion from the natural stream, and such diversion must be accomplished within a reasonable time. What is a "reasonable time" varies with the circumstances of each case. After the lapse of such "reasonable time," the amount actually diverted is the measure of the appropriation—not the notice of appropriation. The practice of posting and recording such notice rests entirely on custom, and such notice is only evidence of intention on the part of the appropriator.

A ditch is a physical and visible monument, and the purchaser of land crossed by it buys with presumptive notice of its existence.

When a ditch is made for the appropriation of water, the right relates back to the commencement of work on the ditch, if the ditch shall be completed within a reasonable time. Not only must the diversion of the water from the natural stream be made within a reasonable time, but the work of construction of the ditch must be prosecuted with diligence. Neither sickness nor pecuniary embarrassments will excuse a failure to show such diligence.

If the ditch be not completed with due diligence the right only accrues from the time the water is actually appropriated.

RIGHT OF WAY.—The congress-

sional act also recognizes and confirms the right of way over the public domain for the construction of ditches and flumes. The Oregon statute provides for the condemnation of private land for right of way.

ABANDONMENT OF DITCHES AND WATER RIGHTS.—The general rule as to abandonment applies to water rights, and a failure to use the water and allowing the ditch to go to decay are evidence tending to prove abandonment.

On this subject the Oregon statutes provide that if any person, company or corporation shall fail or neglect to use the same for a period of two years at any time it shall be taken and deemed to have been abandoned.

The same act declares ditches and flumes when permanently attached to the soil to be real estate; they can, therefore, only be transferred by deed with the usual formalities as to conveyance of that class of property.

A right to use water does not confer the privilege of filling the water course with debris and tailings and allowing them to flow down on the ground of another.

Ground for Dump.

There is no statute providing any method for locating ground to be used as a dump; but a right to dump over unimproved and valueless surface ground undoubtedly exists as a necessary incident to the right to mine, and such right will be protected by the courts as a mining custom.

It has been held that a dump is real property and passes to a purchaser of the ground without special mention.

Dump deposited on the land of an-

other and allowed to remain there indefinitely becomes parcel of the land, and the right to dump may be lost by allowing adverse possession of the ground for the statutory period.

Ground intended for use as a dump should be located and recorded with all the formalities prescribed for a mining claim.

Tailings.

Tailings are the property of the miner who made them, so long as retained on his own land or under his control and not abandoned. When allowed to flow on the land of another the latter becomes entitled to them.

The general rule is that each miner must take care of his tailings or so discharge them as not to injure the property of others.

Right to Timber.

One locating a mining claim is permitted to cut and use the timber thereon for mining purposes.

Mining Partnership.

Where tenants in common of a mine unite and co-operate in working it they constitute a mining partnership. Such partnerships differ from ordinary partnerships in this, (amongst other things), that a change in the personnel of the partnership does not necessarily dissolve the relation; each member has power to dispose of his interest in the mine to any one, and is free to deal with his associates as with a stranger. New members who purchase such interest with knowledge of an outstanding partnership cannot repudiate the same.

In such partnerships the will of the

majority will govern in the administration of the affairs of the company.

The managing partner has authority to defray the necessary and proper expenses out of the proceeds of the mineral or bullion sold, and is entitled to compensation. The implied power of a member of a mining partnership to borrow money so as to bind the firm depends on the question whether such an act is usual in the ordinary conduct of the business.

Patents.

To entitle one to a patent to a mining claim or group of contiguous claims, he, or his grantor, must have expended at least \$500 on labor or improvements on or for the claim or claims or upon one of them.

There is no limit to the number of claims, whether lode or placer, if contiguous, that can be embraced in one application for patent.

An applicant for a patent to a lode claim or mill-site must pay \$5.00 per acre and to a placer claim \$2.50 per acre, besides the cost of making such application.

STATE LAWS.

Quartz Claims.

How Located—Marking Boundaries.

SECTION 1. Any person, a citizen of the United States, or one who has declared his intention to become such, who discovers a vein or lode of mineral-bearing rock in place upon the unappropriated public domain of the United States within this state, may locate a claim upon such vein or lode so discovered by posting thereon

a notice of such discovery and location, which said notice shall contain: First, the name of the lode or claim; second, the name or names of the locator or locators; third, the date of location; fourth, the number of linear feet claimed along the vein or lode each way from the point of discovery, with the width on each side of the said lode or vein; fifth, the general course or strike of the vein or lode as nearly as may be, with reference to some natural object or permanent monument in the vicinity thereof; and by defining the boundaries upon the surface of each claim so that the same may be readily traced. Such boundaries shall be marked within thirty days after posting of such notice by six substantial posts, projecting not less than three feet above the surface of the ground, and not less than four inches square or in diameter, or by substantial mounds of stone, or earth and stone, at least two feet in height, to wit: One such post or mound of rock at each corner and at the center ends of such claims.

Recording.

SEC. 2. Such locator shall, within sixty days from and after the posting of the location notices by him upon the lode or claim, file for record with the recorder of conveyances, if there be one, who shall be the custodian of mining records and miners' liens, otherwise with the clerk of the county, wherein the said claim is situated, a copy of the notice so posted by him upon the lode or claim, having attached thereto an affidavit showing that the work required to be done by Section 3 of this act has been done and performed, and shall pay to the

recorder or clerk a fee of \$1 for such record thereof, which said sum the recorder or clerk shall immediately pay over to the treasurer of such county and shall take his receipt therefor, as in the case of other county funds coming into possession of such officer. Such recorder or clerk shall immediately record such location notice and the affidavit annexed thereto. No location notice shall be entitled to record, or recorded, until the work required by Section 3 of this act has been done and the affidavit in proof thereof is attached to the notice to be recorded.

Discovery Shaft.

SEC. 3. Before the expiration of sixty days from the date of the posting of the notice of discovery upon his claim as aforesaid, and before recording the notice of location, as required by Section 2 of this act, the locator must sink a shaft upon the claim located to a depth of at least ten feet from the lowest part of the rim of such shaft at the surface, or deeper if necessary, to show by such work a lode or vein of mineral deposit in place. A cut or crosscut or tunnel which cuts the lode at a depth of ten feet or an open cut at least six feet deep, four feet wide and ten feet in length, along the lode from the point where the same may be in any manner discovered, is equivalent to such discovery shaft. Such work shall not be deemed a part of the assessment work required by the Revised Statutes of the United States. The locator or some one for him who did work upon and has knowledge of the facts relating to the sinking of the discovery shaft, shall make and attach to the copy of the notice of location to be

recorded an affidavit showing the compliance by the locator with the provisions of this section, which affidavit shall be recorded with such copy of the location notice.

Abandonment.

SEC. 4. Abandoned claims shall be deemed unappropriated mineral lands and titles thereto shall be obtained as in this Act specified without reference to any work previously done thereon.

Realty.

SEC. 5. Mining claims so located shall thereafter be deemed real estate, and the owner of the possessory right thereto shall have a legal estate therein within the meaning of Section 316 of Hill's Code.

Taxation.

SEC. 6. Prior to the obtaining of patent from the general government of the United States to such claim the same shall be exempt from taxation except as to the improvements, machinery and buildings thereon.

Foreclosure and Redemption.

SEC. 7. All conveyances of mining claims, or of interests therein, either quartz or placer, shall be subject to the provisions governing transfers and mortgages of other realty as to execution, recordation, foreclosure, execution sale and redemption sale thereunder, but such redemption by the judgment debtor must take place within sixty days from date of confirmation, or such right is lost.

Penalties.

SEC. 8. In case of redemption from sale under judgment or decree, the redemptioner shall pay such sum or sums as are now required by law for redemption under execution sale, and such additional sum as may have

been expended upon the property so redeemed by the purchaser under execution or his assigns in order to keep alive the possessory right thereto after such execution sale not exceeding the sum of one hundred dollars for each claim, with ten per centum interest thereon from date of such expenditure or expenditures.

Ditches—Abandonment.

SEC. 9. Ditches and mining flumes, permanently affixed to the soil, are hereby declared to be real estate; provided, that whenever any person, company, or corporation, being the owner of any such ditch, flume, and the water right appurtenant thereto, shall cease to operate or exercise ownership over said ditch, flume, or water right for a period of five years, and every person, company, or corporation who shall remove from this state with the intent or purpose to change his or its residence, and shall remain absent one year without using or exercising ownership over such ditch, flume or water right, shall be deemed to have lost all title, claim and interest therein.

SEC. 10. Any and all locations or attempted locations of quartz mining claims within this state subsequent to the thirty-first day of December, 1898, that shall not comply and be in accordance with the provisions of this Act, shall be null and void.

Grubstakes.

SEC. 11. That all contracts of mining copartnership commonly known as grub-staking shall be in writing, and filed for record with the recorder of conveyances of the county wherein locations thereunder are made; and such contracts must contain, first, the names of the parties thereto, and,

second, the duration thereof—otherwise such contract shall be null and void.

Number of Claims Held and Owned.

SEC. 3829. Any person may hold one claim by location, as hereinafter provided, upon each lead or vein, and as many by purchase as the local laws of the miners in the district where such claims are located may allow; and the discoverer of any new lead or vein not previously located upon shall be allowed one additional claim for the discovery thereof; nothing in this section shall be so construed as to allow any person not the discoverer to locate more than one claim upon any one lead or vein.

**CRIME TO INTERFERE WITH
LOCATION MARKS, Etc.**

Section 1. If any person or persons shall willfully and maliciously deface, remove, pull down, injure or destroy any location stake, side post, corner post, land mark or monument, or any other legal land boundary monument in this state, designating, or intending to designate, the location boundary or name of any mining claim, lode or vein of mineral, or the name of the discoverer, or date of discovery thereof, the person or persons so offending shall be guilty of a misdemeanor, and on conviction thereof shall be punishable by a fine of not more than five hundred (\$500) dollars, or by imprisonment in the county jail for a period of not more than six months, or by both such fine and imprisonment in the discretion of the court; provided, that this act shall not apply to abandoned property.

Bell Signals.

Section 1. That from and after the passage of this act the following bell signals shall be used in all mines in the State of Oregon operating a steam, electrical, gasoline or other hoisting plant, to wit:

- 1 bell..... Hoist (see Rule 2)
- 1 bell..... Stop (see Rule 2)
- 2 bells..... Lower (see Rule 2)
- 2—2 bells..... Calls top man to collar of shaft.
- 3 bells..... Man to be moved, run slow (see Rule 2).
- 3—1 bells..... Man to be hoisted, run slow (see Rule 2).
- 3—2 bells..... Man to be lowered, run slow (see Rule 2).
- 4 bells..... Move bucket or cage very slow.
- 4—1 bells..... Start pump
- 4—2 bells..... Stop pump
- 1—3 bells..... Start air compressor
- 2—3 bells..... Stop air compressor
- 5 bells..... Send down tools See Rule 4)
- 6 bells..... Send down timbers (see Rule 4).
- 7 bells..... Accident
- 1—4..... Foreman wanted
- 3—2—2 bells..... Change bucket from ore to water or vice versa.
- 3—2—1 bells..... Ready to shoot in shaft (see Rule 3). Engineer's signal that he is ready to hoist, raise bucket or cage two feet and lower it again (see Rule 3). The bucket or cage must be raised from station six feet when not in use, notice being given to engineer to that effect, as follows: Ring one bell, hoist; and when bucket or cage is up six feet, one bell, stop. Levels shall be designated and inserted in notice hereinafter mentioned. (see Rule 1).

LEVELS.

Section 2. For the purpose of enforcing and properly understanding the above code of signals, the following rules are hereby established:

Rule 1—In giving signals make strokes on bell at regular intervals. The bar (—) must take the same time as for one stroke on the bell and no more. If timber, tools, the foreman, bucket or cage are wanted to stop at any level in the mine, signal by number of strokes on the bell, the number of the level first before giving the signal for timber, tools, etc. The time between the signals to be double bars (— —). Examples: 6—5 would mean, stop at the sixth level with tools: 2—3—1, would mean, stop at the second level, man on bucket or cage, hoist; 4—3—1, would mean, stop at the fourth level, man on bucket or cage hoist; 2—3—2, would mean, stop at the second level, man on bucket or cage, lower.

Rule 2—No person must get on or off the bucket or cage while in motion. When men are to be hoisted or lowered, give the signal for men—men must then get on bucket or cage—then give the signal to hoist or lower. Bell cord must be at all times within reach of man on bucket or cage.

Rule 3—After the signal, "ready to shoot in shaft," engineer must give his signal, when he is ready to hoist, i. e., raise the bucket or cage two feet, then lower it again. Miners must then give signals, "men to be hoisted," then "spit fuse," get on bucket or cage, and give the signal to hoist.

Rule 4—All timbers, tool, etc., "longer than the depth of the bucket or cage" to be hoisted or lowered, must be securely lashed at the upper end

to the cable. Miners must know that they will ride up or down the shaft without catching on rocks or timbers and be thrown out.

Rule 5—The foreman will see that one printed sheet of these signals and rules for each level, one for the collar of the shaft and one for the engine room are attached to a board not less than twelve inches wide by thirty-six inches long, and securely fasten the board up where the signals can be easily read at the places above stated.

Section 3. The above signals must be obeyed. Any violation of the same will be grounds for discharge of the party or parties so doing. No person, company, corporation or individuals operating a mine within the State of Oregon, shall be responsible for accidents that may happen to men disobeying the above rules and signals. Said rules and signals, on notice as above set out, shall be signed by the superintendent or person having charge of the mine, who shall designate the corporation or owner of the said mine.

Section 4. Any person, corporation or individuals operating any mine within the State of Oregon having in operation a steam, electrical, gasoline or other hoisting plant as above described, who shall fail to comply with the terms of this act shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be subject to a fine of not less than \$25 nor more than \$250.

Section 5. Inasmuch as there is no law upon this subject, and it is of importance for the safety and protection of miners and mine owners, an emergency exists, and this act shall take effect from and after its approval by

the Governor.

TO REGULATE LOCATION AND DEFINE RIGHTS OF LOCATORS.

Section 1. That any location of any mining claim made upon any natural stream, or contiguous or near to any placer mine, or upon or below the dump of any placer mine, shall be subject to the prior rights of all mines in operation prior to the making of such location, to discharge debris, gravel, earth and slickens as the same was discharged, or may be discharged at the time of making such subsequently location of mining claim or claims.

Labor Liens on Mining Property.

SECTION 1. That every person who shall do work upon or furnish material for the working or development of any mine, lode, mining claim, or deposit yielding metals or minerals of any kind, or for the working or development of any such mine, lode or deposit in search of any such metal or minerals; and to any person who shall do work or furnish materials upon any shaft, tunnel, incline, adit, drift or other excavation designed for the use of working or draining any such mine, lode or deposit; and any person who shall do work upon or furnish material for any tramway, road or trail used for the working or development of any such mine or mines, or upon any mill site or mill used, owned or operated in connection with such mine or mines; and any person who shall perform work or labor or service on any road, tramway or trail, or in any mill,

boarding house, shop, assay office or otherwise in the working or operation of any such mine or mines; and any person who shall perform work, labor or service in freighting or packing any material or supplies for the use, working or operation of any such mine or mines; and any person who shall perform work, labor or service in freighting or packing any material or supplies for the use, working or operation of any such mine or mines; and any person who shall furnish any provisions or supplies for the working and development of any such mine or mining mill, or any boarding-house or reduction works connected or operated therewith, shall have a lien upon the same to secure to him the payment for the work or labor done or material furnished by each respectively, which shall attach in every case to such mine, lode or deposit, and to any road, tramway, mill, reduction works or other improvement in connection with and used in the operation and working of the same, and though such shaft, tunnel, incline, adit, drift or other excavation, mill or improvement be not within the limits of such mine, lode or deposit; provided, that when two or more mines, lodes or deposits owned or claimed by the same person or persons shall be worked through a common shaft, or tunnel, incline, adit, drift or other excavation, or over one tram, or at one mill or reduction works, then all the mines, lodes or deposits so worked, and all mill sites, roads, tramways, mill or other works used and owned in connection therewith shall, for the purpose of this act, be deemed one mine; and provided, further, that this section shall not be deemed to apply to the owner or own-

ers of any mine, lode, deposit, shaft, tunnel, incline, adit, drift or other excavation, mill or mill site, when same shall be worked by a lessee or lessees, provided the lessor of any such mine, lode, deposit, shaft, tunnel, incline, adit, drift or other excavation, will site or mill shall have recorded in the mining records of the county wherein any such mine is located a copy of any such lease before the work shall have begun on any such property.

Appropriation of Water and Condemnation of Right of Way, etc.,

SECTION 1. That the uses of the water of the lakes and running streams of the state of Oregon, for the purpose of developing the mineral resources of the state, and to furnish electrical power for all purposes is declared to be a public and beneficial use, and a public necessity and the right to divert unappropriated waters of any such lakes or streams for such public and beneficial use is hereby granted.

Sec. 2. All persons, companies and corporations, having title or possessory right to any mineral or other land, shall be entitled to the use and enjoyment of the water of any lake or running stream within the state, for mining and other purposes, in the development of the mineral resources of the state or to furnish electrical power for any purposes, and such waters may be made available to the full extent of the capacity thereof without regard to deterioration in equality or diminution in quantity, so that such use of the same does not materially

affect or impair the rights of prior appropriations.

Right of Way.

Sec. 3. All such persons, companies and corporations may appropriate and divert such waters, and may condemn right of way for ditches, canals, flumes and pipe lines for the conveying of same, and may condemn the rights of riparian proprietors upon the lake or stream from which such appropriation is made, upon complying with the terms of this act. Such persons, companies and corporations shall also have the right to condemn lands for the sites of reservoirs for storing water for future use, and for rights of way for feeders, carrying water to such reservoirs, and ditches, canals, flumes or pipe lines carrying the same away, and shall have the right to take from any lake or running stream in this state, and store away any water not previously appropriated or not needed for immediate use by any person having a superior right thereto.

Point of Diversion.

Sec. 4. Such persons, companies and corporations may enter upon any land for the purpose of locating a point of diversion of the water intended to be appropriated and upon any land lying between such point and the lower terminus of its proposed ditch, canal, flume or pipe line for the purpose of examining the same and of locating and surveying the line of such ditch, canal, flume or pipe line together with the lines of necessary distributing ditches and feeders for reservoirs, and to locate and determine the site for reservoirs for storing water.

Notice.

Sec. 5. When a point of diversion shall have been selected, such appropriator shall post in a conspicuous place thereat a notice in writing, containing a statement of the name of the ditch, canal, flume or pipe line and of the owner thereof, the point at which its headgate is proposed to be constructed, a general description of the course of said ditch, canal, flume or pipe line, the size or dimensions of same in width and depth, the number of cubic inches of water, by miner's measurement under a six inch pressure, intended to be appropriated, and the number of reservoirs, if any.

Time of Filing Notice.

Sec. 6. Within 10 days from the date of posting such notice, such appropriator shall file for record in the office of the county clerk or recorder of conveyances, as the case may be, of the county in which said ditch or canal or flume or pipe line, distributing ditches, reservoirs and feeders are situated, a similar notice, and at the same time shall file a map showing the general route of said ditch or canal or flume or pipe line; and, in case said ditch or canal or flume or pipe line distributing ditches, reservoirs and feeders shall not lie wholly in one county, such notice and map shall be filed in the office of the county clerk or recorder of conveyances of each county in which any portion of said ditch or canal or flume, distributing ditches, reservoirs and feeders may be situated. Within 60 days from the completion of such ditch or canal or flume or pipe line, such appropriator shall in like manner file a map of definite location of said ditch or canal

or flume or pipe line, by legal subdivision of the land traversed thereby, in case it is surveyed, with the points of location of reservoirs, if any, designated thereon. It shall be the duty of every county clerk or recorder of conveyances, immediately upon the filing of such notice in his office, to record the same in a book kept for such purpose, and he shall file and preserve such maps among the records of his office.

Width of Right of Way.

Sec. 7. When such persons, companies and corporations shall have acquired the right to appropriate water in the manner hereinbefore provided, it may proceed to condemn lands and premises necessary for right of way for its ditch or canal or flume or pipe line, and likewise for its distributing ditches and feeders, and for sites for reservoirs, but right of way for the main line of said ditch or canal or flume or pipe line shall not exceed 50 feet in width and for each distributing ditch or feeder 30 feet in width and for a site for each reservoir 20 acres from one owner, or for every 10,000 inches of water, miners' measurement, as aforesaid, or fraction thereof over half of the capacity of the main ditch or canal or flume or pipe line, for every 20 miles of its length.

Condemnation Procedure.

Sec. 8. Whenever any persons, companies and corporations authorized as hereinbefore provided to appropriate water and to construct and maintain a ditch or canal, flume or pipe line for mining purposes or to furnish electrical power for any purpose, and to condemn lands for right of way and sites for reservoirs is un-

able to agree with the owner of such lands as to compensation to be paid therefor, or if such owner be absent from the state or incapable of acting, such persons, companies and corporations may maintain an action in the circuit court of the county in which the lands sought to be appropriated or some portion thereof are situated, for the purpose of having such lands appropriated to its use, and for determining the compensation to be paid to such owner therefor. The proceedings in such action to final determination shall be the same as those prescribed by title 3 of chapter 32, of the miscellaneous laws of Oregon, as found in volume 2, of the Annotated Laws of Oregon, compiled by W. Lair Hill.

Sec. 9. Such persons, companies and corporations may also maintain an action for the condemnation and appropriation of the right to the flow of water in any stream from which it proposes to divert the water below the point of diversion vested in the owners of the lands lying contiguous to such stream by virtue of their location. Such actions shall be brought in the county where the—

NOTE.—The enrolled law ends in this abrupt manner.

Work to Commence.

Sec. 10. Within six months from the date of the posting of the notice above prescribed, the persons, companies and corporations proposing to appropriate the water therein mentioned shall commence the actual construction of their or its proposed ditch or canal or flume or pipe line, and shall prosecute the same without intermission except as resulting from the act of God, the elements or unavoidable casualty, until the same is

completed and the actual capacity of said ditch or canal or flume or pipe line, when completed, shall determine the extent of the appropriation, anything contained in the notice to the contrary notwithstanding. Upon a compliance with the provisions of this act, the right to the use of the water appropriated shall relate back to the date of posting said notice.

Existing Appropriations.

Sec. 11 All existing appropriations of water made for beneficial purposes, by any persons, corporation, or companies, in accordance with the laws of the United States, or in accordance with the laws of the state of Oregon, or the decision of the supreme court, or the established customs and regulations of the district in which such appropriations have been made, shall be respected and upheld to the extent of the amount of water actually appropriated, nor shall any existing mill be deprived of its water power, however lawfully acquired, without the consent of its owner; and all controversies respecting rights to water under the provisions of this act shall be determined by the date of the appropriations as respectively made thereunder by the parties.

Right to Change Point of Diversion.

Sec. 12. In case the channel of any natural stream shall become so cut out, lowered, turned aside or otherwise changed from any cause as to prevent any ditch or canal or flume or pipe line or feeder of any reservoir from receiving the proper inflow of water to which it may be entitled from such natural stream, the persons, companies or corporation owning such ditch or canal or pipe line, flumes or

feeder, shall have the right to extend the head of such ditch or canal, or pipe line, flume or feeder, to such distance upon the streams which supply the same as may be necessary for securing a sufficient flow of water into the same, and for such purpose such persons, companies or corporations shall have the same right to maintain proceedings for condemnation of right of way for such extension as in case of constructing a new ditch, and the priority of right to take the water from such stream through any ditch or canal, pipe line, flume or feeder shall be unaffected in any respect by reason of a change in the place of diversion; provided, no such change shall interfere with the complete use or enjoyment of any other ditch or canal, pipe line, flume or feeder lawfully constructed. And when from any cause the line of any ditch or canal, pipe line, flume or feeder along the line of common use, by reason of the faulty construction of such portion of such ditch, canal, flumes or pipe line, and the persons, companies or corporation securing the use of the same shall be liable to the owner, persons, companies or corporations for all damages by it sustained growing out of the enlargement of said ditch, canal, flume or pipe line, or the increased volume of water turned therein. Before proceeding to secure the right to make use of any portion of the ditch, canal, flume or pipe line, the person, companies or corporations seeking to secure the same shall execute and deliver to the owner, persons, companies or corporation a bond with sufficient sureties in an amount equal to the original cost of construction and the estimated cost of enlargement of the

portion of said ditch, flume, or pipe line sought to be subjected to a double use, conditional for the payment on demand to the owner, persons, companies or corporations of a reasonable portion of the original cost of construction of such portion of said ditch, canal, flume, or pipe line and of the cost of enlargement thereof, together with a reasonable portion of the cost of its maintenance as enlarged and of all damage that may at any time accrue to the owner, persons or companies or corporation and for which it shall have a right of recovery against said other persons, companies or corporations by reason of the provisions of this section; provided, that in case the persons, companies or corporations owning said ditch, canal, flume or pipe line shall object to the amount or sufficiency of the sureties on such bonds, it shall serve upon the corporations, companies or persons desiring to use such ditch, canal, flumes or pipe line within ten days after receiving said bond a notice specifying particularly the objections thereto, and the sufficiency of the sureties or the amount of the bond shall be determined by the judge of the circuit court of the county wherein said ditch, canal, flume or pipe line is situated, and said judge may hear evidence at chambers in relation as originally constructed, can no longer be maintained, the persons, companies or corporations owning the same may alter the course thereof and for such purpose may condemn lands for right of way as in case of original construction.

Most Direct Route.

Sec. 13. Whenever it becomes necessary to construct any ditch, canal,

flume, pipe line, distributing ditches, or feeder across the improved or occupied lands of another, under the provisions of this act, such persons, companies or corporations shall select the shortest and most direct route practicable, having reference to cost of construction upon which said ditch, canal, flume, pipe line, distributing ditches or feeders can be constructed with uniform or nearly uniform grade.

Written Consent.

Sec. 14. No tract or parcel of improved or occupied land in this state shall, without the written consent of the owner thereof, be subjected to the burden of two or more ditches or canals, flumes or pipe lines constructed under this act for the purpose of conveying water through said property when the same object can be feasibly and practically attained uniting and conveying all the water necessary to be conveyed through such property in one ditch, canal, flume or pipe line; and any persons, companies or corporations having constructed a ditch, canal, flume or pipe line for the purpose hereinbefore provided shall allow any other persons, companies or corporations to enlarge such ditch, canal, flume or pipe line so as not to interfere with the operations of the persons, companies or corporations owning the same, and use such ditch, canal, flume or pipe line in common with the persons, companies or corporations owning the same upon payment to such persons, companies or corporations of a reasonable proportion of the cost of constructing and maintaining such ditch, canal, flume or pipe line; such persons, companies or corporations shall be jointly liable to any person damaged.

Natural Channel.

Sec. 15. In constructing a ditch, canal, flume or pipe line, distributing ditches, or feeders, under the provisions of this act, the owner or owners thereof may make use of natural depressions in the earth along the line thereof to all intents and purposes as parts of said ditch, canal, flume or pipe line, distributing ditches or feeders; and it may conduct the water appropriated by it along the channel of any natural stream, but not so as to raise the water thereof above ordinary highwater mark, and may take the same out again at any point desired without regard to the prior rights of others to water from said stream; but due allowance shall be made for evaporation and seepage.

Repairs.

Sec. 16. The owner or owners of every ditch, canal, flume or pipe line constructed under the provisions of this act shall be required to erect and keep in good repair a headgate at the head of its ditch, canal, flume or pipe line, which, together with the necessary embankments, shall be sufficient height and strength to control the water at all ordinary stages. The frame work of such headgate shall be of timber not less than four inches square, and the bottom, sides and gate or gates, shall be of plank not less than two inches in thickness.

Damages.

Sec. 17. The owner or owners of every ditch, canal, flume or pipe line, constructed under the provisions of this act, shall be liable for all damages done to the persons or property of others arising from leakage or overflow of water therefrom, growing out of

want of strength in the banks or walls or negligence or want of care in the management of said ditch, canal, flume or pipe line, or reservoir; provided, that damage resulting from extraordinary and unforeseen action of the elements, or attributed in whole or in part to the wrongful interference of another with said ditch, canal, flume, pipe line or reservoir, which may not be known to said corporation, for such length of time as would enable it, by the exercise of reasonable effort, to remedy the same, shall not be recovered against said corporations, companies or persons.

Across Public Highways.

Sec. 18. The owner or owners of every ditch, canal, flume or pipe line constructed under the provisions of this act, across any public highways or public traveled roads, shall put a good substantial bridge, not less than 14 feet in breadth, over such ditch, canal or flume where it crosses said highway or road. Travel shall not be suspended by the construction of said ditch, canal, flume or pipe line, and such bridge shall be completed within three days from the time said highway or road is intersected. In case such bridge is not so constructed and completed, it shall be the duty of the road supervisor of the road district in which the point of intersection is situated to construct said bridge, and he shall bring an action in his own name as supervisor for the use and benefit of his road district, in any court of competent jurisdiction, to recover the expense of constructing said bridge, and in such action, in addition to the costs and disbursements, provided by statute, he shall recover such sum as

the court or justice, if the action be brought in a justice's court, may adjudge to be reasonable as attorney fees in said action. Appeals may be taken in such cases, as in other actions.

Sec. 19. The owner or owners of every ditch, canal, flume or pipe line, constructed under the provision of this act, shall carefully keep and maintain the embankments and walls thereof, and of any reservoir constructed to be used in conjunction therewith, so as to prevent the water from wasting and from flooding or damaging the premises of others; and it shall not divert at any time any water for which it has not actual use or demand.

Abandonment.

Sec. 20. The right to appropriate water hereby granted may be lost by abandonment; and, if any persons, companies or corporations constructing a ditch, canal, flume or pipe line, under the provisions of this act shall fail or neglect to use the same for a period of two years at any time, it shall be taken and deemed to have been abandoned its appropriation, and the water appropriated shall revert to the public, and be subject to other appropriations in order of priority. But the question of abandonment shall be one of fact, to be tried and determined as other questions of fact.

Penalties for Damage to Ditch.

Sec. 21. Any person who shall knowingly and willfully cut, dig, break down, or open any gate, bank, embankment, or side of any ditch, canal, flume, pipe line, feeder or reservoir constructed under the provisions of this act, the property of another, with intent maliciously to injure the owner or owners of such property, or

any other person, or for his or her own gain, by unlawfully causing the water contained in said ditch, canal, flume, pipe line, feeder or reservoir to run or pour thereout with intent of stealing the same or appropriating it for his or her own gain, profit, benefit or advantage, without the consent of the owner or owners thereof, shall be deemed guilty of a misdemeanor, and, upon conviction thereof, shall be punished by fine of not less than \$10 nor more than \$300, or by imprisonment in the county jail not less than one month nor more than one year. Justices' courts shall have jurisdiction of all the prosecutions arising under this section. The person so trespassing shall also be liable for all damage caused by his or her act to the owner or owners of said property, or any person or persons injured by his or her wrongful act.

To Determine Priority.

Sec. 22. In any suit which may hereafter be commenced for the protection of rights of water acquired under the provisions of this act, the plaintiff may make any or all persons who have diverted water from the same stream or source parties to such suit, and the court may in one decree determine the relative priorities and rights of all parties to such suit, any person claiming a right on said stream or source, not made a party to such suit, may become such upon application to the court, when it is made to appear that he is interested in the result of the suit, and may have his right determined, and the court may, at any stage, on its own motion, require any or all persons having or claiming rights to water on said stream or

source, to be brought in and made parties to said suit, when it appears that a complete determination of the issue involved cannot be made without the presence of such person or persons.

Sec. 23. The right of way, to the extent hereinbefore specified, for the ditches or canals, flumes, pipe lines, distributing ditches and feeders of any persons, companies or corporations appropriating water, under the provisions of this act, across any and all lands belonging to the state of Oregon, and not under contract or sale, is hereby granted.

Sec. 24. Inasmuch as this state contains large tracts of mineral lands which cannot be successfully worked or the mineral extracted therefrom without the use of water, and the working of said mining properties will largely increase the wealth of this state; and, whereas, the appropriation and use of the water of the streams and lakes of this state for the purpose of developing its mineral resources, and the right to build ditches, canals, flumes, pipe lines and reservoirs in connection with such appropriation and use, and the right to condemn lands necessary for the right of way and maintenance thereof are uncertain and vexed questions, and should be speedily settled, therefore, an emergency exists, and this act shall take effect and be in force from and after its approval by the governor.

REGULATING SALE OF LIQUOR NEAR MINES.

Section 1. It shall be unlawful for any person or persons to sell or in anywise dispose of any spirituous or malt or intoxicating liquors upon or

within one mile of any quartz or placer mine in active operation within this state; provided, that this act does not apply to incorporated cities and towns.

Sec. 2. Any person or persons violating the provisions of this act shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined in any sum not less than \$50 nor more than \$200, and each and every day that any person or persons shall sell or dispose of any liquors contrary to any provisions of this act shall constitute a separate offense, and shall be punished accordingly.

Sec. 3. Inasmuch as the sale of liquors on or near mines endangers life and property, an emergency is declared to exist, and this act shall be in full force and effect from and after its approval by the Governor.

Forms.

[No. 1.]

PLACER LOCATION NOTICE. Kid Glove Placer Claim.

The undersigned claims 1320 feet in length along this gulch by 660 feet in breadth for placer mining purposes, as staked on this ground.

Discovered June 1, 1897.

Richard Roe.

[No. 2.]

PLACER LOCATION CERTIFICATE.

Know all men by these presents: That I, Richard Roe, of the county of Josephine, state of Oregon, claim by right of discovery and location, the Kid Glove placer claim containing 20

acres (or 1,320 feet in length by 660 feet in width,) situate in the Galice creek mining district, county of Josephine, state of Oregon, and bounded and described as follows: Beginning at stake at corner No. 1, etc. [Here insert description, giving a course to each line and tying one or more corners to a government corner, well-known natural object or permanent monument, etc.] Date of discovery, June 1, 1897. Date of location, June 1, 1897. Date of certificate, June 5, 1897.

Richard Roe.

[No. 3.]

NOTICE POSTED ON LODE CLAIM.

The Sunbeam Lode, discovered by C. V. Meade, February 18, 1894. Claim 750 feet easterly and 750 feet westerly from discovery. . . . C. V. Meade.

[No. 4.]

LODE LOCATION CERTIFICATE.

Know all men by these presents: That I, C. V. Meade, of the county of Josephine, state of Oregon, claim by right of discovery and location 1,500 feet, linear and horizontal measurement, on the Sunbeam Lode, along the vein thereof, with all its dips, variations and angles, together with 300 feet in width on each side of the middle of said vein at the surface; and all veins, lodes, ledges, deposits and surface ground within the lines of said claim; seven hundred and fifty feet on said lode running north 88 degrees east from the center of the discovery shaft, and seven hundred and fifty feet running south 88 degrees

west from said center of the discovery shaft.

Said claim is situate in the Dry Diggings mining district, Josephine county, Oregon, and is bounded and described as follows, to wit: [Here insert description as stated in form 2.] Date of discovery, February 18, 1894. Staked and located, February 20, 1894. Date of certificate, March 1, 1894.

C. V. Meade.

Attest: William Smith.

[No. 5.]

LOCATION OF DITCH AND WATER RIGHT.

To all whom these presents concern: Know ye, that, the undersigned, do hereby declare and publish as a legal notice to all the world that have a valid right to the occupation, possession and enjoyment of, all and singular, that tract or parcel of land lying and being in mining district, in county, Oregon, for ditch and mining purposes, bounded and described as follows, to wit: the ditch: head of ditch tapping the waters of creek at a point indicated by notice there posted on the bank about also claim miners' inches of the waters of said stream, to be conveyed by said ditch, with the exclusive right of way for said ditch, together with, all and singular, the hereditaments and appurtenances thereunto belonging or in any wise appertaining. Witness hand.. this day of 189...

Witnesses:

.....
.....
.....

[No. 6.]

OPTION TO PURCHASE MINING CLAIM.

I, of the county of state of Oregon, in consideration of dollars to me paid by of the county of state of Oregon, do hereby agree to sell and convey to said and his assigns, the following described mining claim, situate in the mining district, in the county of state of Oregon, to wit:

for the sum of dollars, to be paid as follows: Said mining claim.. to be conveyed by deed, free from all incumbrances, upon payment of said sum or sums of money on or before the day of 189... And if not so paid, this option shall be absolutely void. For the performance of these conditions I bind myself, my heirs, executors and administrators.

Witness my hand and seal this day of 189...

..... [Seal.]

Witnesses:

.....
.....

[No. 7.]

DEED CONVEYING QUARTZ CLAIM.

This indenture, made the day of 189..., between of the county of and state of part.. of the first part, and of the county of and state of part.. of the

second part, Witnesseth: That the said part.. of the first part, for and in consideration of the sum of dollars, lawful money of the United States of America, to in hand paid by the said part.. of the second part, the receipt whereof is hereby acknowledged, ha---- granted, bargained, sold, remised, released and forever quit-claimed, and by these presents do-- grant, bargain, sell, remise, release and forever quit-claim unto the said heirs and assigns, the mining claim situated in the mining district, county of state of and better known and described as follows:

Together with all the dips, spurs and angles, and also all the metals, ores, gold and silver-bearing quartz, rock and earth therein; and all the rights, privileges and franchises thereto incident, appendent and appurtenant, or therewith usually had and enjoyed; and also, all and singular the tenements, hereditaments and appurtenances thereto belonging, or in any wise appertaining, and the rents, issues and profits thereof; and also all the estate, right, title, interest property, possession, claim and demand equity, of the said part.. of the first part, of, in or to the said premises, and every part and parcel thereof, with the appurtenances.

To have and to hold, all and singular the said premises, together with the appurtenances and privileges thereto incident, unto the said part.. of the second part..... heirs and assigns forever. In witness whereof, the said part.. of the first part ha---- hereunto set..... hand and

seal the day and year above written.

[Seal.]

Signed, sealed and delivered in presence of

[No. 8.]

PROOF OF LABOR.

State of.....County of....., ss.

Before me the subscriber personally appeared....., who being duly sworn says that at least.....dollars' worth of labor or improvements were performed or made upon [here describe claim], situated in.....mining district,.....county,.....of....., during the year ending.....190.. Such expenditure was made by or at the expense of.....owners of said claim, for the purpose of holding said claim.

.....(Signature.)

[No. 9.]

TUNNEL CLAIM—LOCATION CERTIFICATE.

Know all men by these presents, that the undersigned, citizen of the United States, have this.....day of....., 1....., claimed by right of location, a tunnel claim, for the purpose of discovering and working veins, lodes or deposits on the line thereof (cutting the.....lode, and working the.....lode). Said tunnel claim is situated in the.....mining district, county of....., State of....., and the location and bounds of said tunnel are staked on the surface at the place of commencement and termination thereof. Said claim is more particularly described as follows:

Dated.....1.....

Locator.

[No. 10.]

POWER OF ATTORNEY TO LOCATE AND SELL.

Know all men by these presents, that we, the undersigned.....citizens of the United States, have made, constituted and appointed.....our true and lawful attorney for us, and in our names to locate, stake and record for us each lode claims and placer mining ground in the.....county,.....of....., and having located the same, to bargain, sell, grant, release and convey the same, entire or in separate parcels, to make proper deeds, seal, acknowledge and deliver the same to such persons as our attorney may desire; hereby ratifying and confirming all lawful acts done by our said attorney by virtue hereof.

Witness our hands and seals, this.....day of....., 1.....

State of....., County of....., ss.

On this.....day of....., 1....., before me.....in and for the county and State aforesaid, appeared.....personally known to me as the persons whose names are subscribed to the foregoing power of attorney, and acknowledged the execution thereof as their free act and deed, for the purposes therein mentioned.

Given under my hand and.....seal the day and year above written.

ESCROW AGREEMENT.

The inclosed deed of the.....lode is hereby placed in the.....Bank of....., in escrow. If A. B. shall place, or cause to be placed to the credit

of C. D. and E. F., in said-----bank
of-----on or before-----, 190--.,
the full sum of-----dollars, then and
in that case the said bank is hereby
authorized to deliver the enclosed deed
to A. B., or his order. In case the said
A. B. shall not place, or cause to be
placed to the credit of said C. D. and
E. F., in said bank, the full sum-----
dollars, on or before-----190--., then
the said bank is hereby authorized to
deliver the inclosed deed to the said C.
D. and E. F., or their joint order.

(Signed)

C. D.

E. F.

A. B.

-----, 190--., (Place
and date).

NOTE.—When the option for the purchase of a mine is desired by a third party, it is the safest and best plan for the mine owner to put a deed in escrow. It saves encumbering of the record, and any questions that might arise concerning the payment of money. The deed should be a warranty, quit claim, or mining deed, as agreed, fully executed and acknowledged, ready for delivery, put in a sealed envelope, and placed in some bank, or left with some responsible person, with an agreement written up on the envelope, as above.

AFFIDAVIT OF WORK.

State of-----, County of-----, ss.

I,-----, of-----Oregon,
being duly sworn depose and say that
(Here state work done.)

I have-----

as required by Sec. 3 of the Act of 1901.

-----Locator.

-----Laborer.

Subscribed and sworn to before me
this-----day of-----190--

MEASURES - WEIGHTS

MEASURES OF WEIGHT.

Troy.

Gold and silver are bought and sold
by Troy weight:

24 grains 1 pennyweight

20 pennyweights 1 ounce

12 ounces 1 pound.

The price established by the U. S.
government for pure gold is \$20.67 per
ounce. That is for gold 1000 fine or
24 karats.

The term karat is used by jewelers
to express the degree of fineness of
gold, dividing it into 24 degrees or
karats.

Pure gold is 24 karats fine and worth
\$20.67 per ounce.

22 karat gold.....	\$18 94	12 karat gold.....	\$10 33½
20 karat gold.....	17 22	10 karat gold.....	8 61
18 karat gold.....	15 50	8 karat gold.....	6 89
16 karat gold.....	13 78	6 karat gold.....	5 16
14 karat gold.....	12 06		

Gold in jewelry is seldom less than
6 karats fine.

Gold 1000 fine is worth	\$20 67 per ounce
Gold 900 fine is worth	18 60 per ounce
Gold 800 fine is worth	16 53 per ounce
Gold 700 fine is worth	14 47 per ounce
Gold 600 fine is worth	12 40 per ounce
Gold 500 fine is worth	10 33 per ounce
Gold 400 fine is worth	8 26 per ounce
Gold 300 fine is worth	6 20 per ounce
Gold 200 fine is worth	4 13 per ounce
Gold 101 fine is worth	2 06 per ounce

Many persons are mistaken in thinking
all ounces to be alike. An ounce
Troy or Apothecaries weight, contains
480 Troy grains. An ounce avoirdupois
weight contains 437½ Troy grains.

The grain is the unit of Troy and
Apothecaries weight, and the ounce is
the unit of Avoirdupois weight.

One pound Troy or
Apothecaries weight
contains-----5760 Troy grains

One pound Avoirdupois weight contains 7000 Troy grains

All natural gold, that is gold extracted from rocks or washed from the beds of streams, contains some alloy, generally silver, but sometimes platinum, copper and tellurium, and it varies in different localities.

Avoirdupois.

16 drahms 1 ounce
16 ounces 1 pound
112 pounds 1 cwt.
20 cwt. 1 ton.

To reduce Avoirdupois pounds to Troy ounces, multiply the Avoirdupois pounds by 14.5833.

Water.

A gallon of water (U. S. standard) weighs $8\frac{1}{8}$ pounds and contains 231 cubic inches. A cubic foot of water weighs 62 $\frac{1}{2}$ pounds and contains 1736 cubic inches, or $7\frac{1}{2}$ gallons.

MEASURES OF ORES, EARTH, ETC.

13 cubic feet of ordinary gold or silver ore, in mine, equals 1 ton,
20 cubic feet of broken quartz equals one ton, or 2000 pounds.

In calculating the quantity of ore "in place" in a mine, an allowance is generally made for moisture in the ore, determined by the character of the ore.

18 feet of gravel in bank equals 1 ton.
27 cubic ft of gravel, dry, equals 1 ton.
25 cubic feet of sand equals one ton.
18 cubic ft of earth in bank equal 1 ton.
27 cubic feet of earth, dry, equal 1 ton.
17 cubic feet of clay equals one ton.

Weight of Nails and Spikes.

8 penny, 1 in. long.....	557 in a pound
4 " 1 1/2 "	356 " "
5 " 1 3/4 "	232 " "
6 " 2 "	175 " "
7 " 2 1/4 "	141 " "
8 " 2 1/2 "	101 " "
10 " 2 3/4 "	68 " "
12 " 3 "	54 " "
20 " 3 1/2 "	34 " "
spikes 4 "	16 " "
" 4 1/2 "	12 " "
" 5 "	10 " "

Weight per Cubic Foot of Minerals.

	Lbs. Av.
Galena—Lead sulphide.....	468
Pyrite—Iron sulphide.....	340
Blende—Zinc sulphide.....	250
H-menite—Iron sesqui. oxide, Fe 2 O 3.....	225
Magnetite—Iron oxide, Fe 3 O 4.....	312
Quartz—Silicic acid.....	166
Limestone—Calcium carbonate.....	170
Sibnite—Antimony sulphide.....	281
Chalcoite—Copper sulphide.....	259
Malachite—Copper carbonate.....	250
Coal—Anthracite.....	50
Cassiterite—Tin oxide.....	406
Granite.....	165

BOARD AND TIMBER MEASURE.

Board Measure.

In board measure boards are assumed to be one inch in thickness.

To compute the measure of surface in square feet. When all dimensions are in feet: Multiply the length by the breadth, and the product will give the surface required.

When either of the dimensions are in inches: Multiply as above and divide the product by 12.

When all dimensions are in inches: Multiply as before and divide the product by 14.

Timber Measure.

To compute the volume of round timber when all dimensions are in feet: Multiply the length by the square of one-quarter of the main girt, and the product will give the measurement in cubic feet.

When length is given in feet and girth in inches: Multiply as before and divide by 144.

When all the dimensions are in inches: Multiply as before and divide by 1728.

Sawed or hewed timber is measured by the cubic foot.

To Compute the Volume of Square Timber

When all dimensions are in feet: Multiply the product of the breadth by the depth by the length, and the product will give the volume in cubic feet.

When either of the dimensions are in inches: Multiply as above and divide the product by 12.

When any two of the dimensions are in inches: Multiply as before and divide the product by 144.

MEASURES OF SURFACE.

144 square inches 1 square foot
9 square feet 1 square yard
30.25 square yards 1 square rod
160 square rods, or 10 square chains, or 43.560 square feet 1 acre
640 acres 1 square mile.

MEASURES OF VOLUME.

1728 cubic inches 1 cubic foot
27 cubic feet 1 cubic yard.

GUNTHER'S CHAIN.

7.92 inches 1 link
100 links 1 chain, 4 rods or 22 yards
80 chains 1 mile.

TEMPERING STEEL.

Steel in its hardest state being too brittle for most purposes, the requisite strength and elasticity are obtained by tempering—or LETTING DOWN THE TEMPER, as it is termed—which is performed by heating the hardened steel to a certain degree and cooling it quickly. The requisite heat is usually ascertained by the color which the surface of the steel assumes from the film of oxide thus formed. The degrees of heat to which these several colors correspond are as follows:

At 430, a very faint yellow. At 450, a pale straw color.

Suitable for hard instruments, as hammer faces, drills, etc.

At 470, a full yellow. At 490, a brown color.

For instruments requiring hard edges without elasticity; as shears, scissors, turning tools, etc.

At 510, brown, with purple spots. At 537, purple.

For tools for cutting wood and soft metals; such as plane-irons, knives, etc.

At 550, dark blue. At 560, full blue.

For tools requiring strong edges without extreme hardness; as cold-chisels, axes, cutlery, etc.

At 600, grayish blue, verging on black.

For spring temper, which will bend before breaking; as saws, sword-blades, etc.

If the steel is heated higher than this, the effect of the hardening process is destroyed.

CAPACITY OF DITCHES IN MINERS' INCHES.

Width at top.....	2.2 feet.	3.5 feet.	4.4 feet.	5.5 feet.	6.6 feet.	7.7 feet.	8.8 feet.
Width at bottom.....	1.8 "	1.5 "	2.0 "	2.5 "	3.0 "	3.5 "	4.0 "
Depth of stream.....	0.8 "	1.2 "	1.6 "	2.0 "	2.4 "	2.8 "	3.2 "
Area of section.....	1.28 sq. ft.	2.88 sq. ft.	5.12 sq. ft.	8.0 sq. ft.	11.52 sq. ft.	15.68 sq. ft.	20.48 sq. ft.
FALL.		Capacity,	Capacity,	Capacity,	Capacity,	Capacity,	Capacity,
Per mile, feet.	Per rod, fathes.	miner's inches.	miner's inches.	miner's inches.	miner's inches.	miner's inches.	miner's inches.
1	0.036	22	61	133	278	452	673
2	.073	31	94	193	394	640	952
3	.109	38	115	237	482	783	1166
4	.145	44	132	273	557	926	1346
5	.182	50	148	306	623	1012	1505
6	.219	54	162	335	682	1108	1649
7	.254	59	171	362	737	1197	1781
8	.291	63	187	386	787	1280	1904
9	.327	67	199	410	835	1357	2019
10	.364	70	209	432	880	1431	2128
11	.401	74	220	453	923	1501	2232
12	.436	77	230	474	965	1567	2332
13	.476	80	239	493	1004	1631	2427
14	.509	83	248	512	1042	1693	2519
15	.545	86	257	530	1078	1752	2607
16	.582	89	265	547	1113	1810	2693
17	.618	92	273	564	1148	1865	2775
18	.654	94	281	580	1181	1919	2855
19	.691	97	289	596	1214	1972	2929
20	.727	100	296	611	1255	2023	3010
21	.763	102	304	627	1276	2073	3055
22	.800	104	311	641	1306	2123	3157
23	.836	107	318	656	1335	2170	3228
24	.873	109	325	670	1364	2217	3297
25	.909	111	331	684	1399	2262	3366

The following table gives the number of miners' inches required to give a certain head for a certain size nozzle:

Head feet—	MINERS' 2-inch nozzle	MINERS' 2½-in. nozzle	MINERS' 3-inch nozzle	INCHES 4-inch nozzle	INCHES 5-inch nozzle
100.....	80	125	185	325	500
150.....	100	155	225	400	625
200.....	115	180	260	460	715
250.....	130	200	290	515	800
300.....	140	220	320	565	880
350.....	150	240	345	610	950
400.....	160	255	365	650	1000

MINER'S INCH.

A miner's inch of water is the quan-

tity of water which will pass through a hole one inch square the board being one and one-half inches thick with the water in the reservoir standing six inches above the hole.

Water Required for Quartz Mill.

The quantity of water required to work either gold or silver ores by wet battery process is generally estimated as follows:

For boiler, 7½ gallons per horse power per hour.

For each stamp, 72 gallons per hour.

For each pan, 120 gallons per hour. pans and settlers be run into settling
For each settler, 60 gallons per hour. tanks it can be re-used with a loss of
If the water used in the battery, about 25 per cent.

TABLE FOR CALCULATING THE HORSE-POWER OF WATER.

Miner's Inch Table.

The following table gives the horse-power of one miner's inch of water under heads from 1 up to 1100 feet. This equals $1\frac{1}{2}$ cubic feet per minute.

Cubic Feet Table.

The following table gives the horse-power of one cubic foot of water per minute under heads from 1 up to 1100 feet.

Heads in feet	Horse power	Heads in feet	Horse power
1	.0024147	320	.772704
20	.0482294	330	.796851
30	.72441	340	.820998
40	.096588	350	.845145
50	.120735	360	.869292
60	.144882	370	.893439
70	.169029	380	.917586
80	.193176	390	.941733
90	.217323	400	.965880
100	.241470	410	.99 027
110	.265617	420	1.014174
120	.289764	430	1.038321
130	.313911	440	1.062468
140	.338 58	450	1.086615
150	.362205	460	1.110762
160	.386352	470	1.134909
170	.410499	480	1.159056
180	.434646	490	1.183206
190	.458793	500	1.207350
200	.482940	520	1.255644
210	.5071 87	540	1.303938
220	.531234	560	1.352232
230	.555381	580	1.4 0526
240	.579528	600	1.448820
250	.603675	650	1.569555
260	.627822	700	1.690290
270	.651969	750	1.811025
280	.676116	800	1.931760
290	.700263	900	2.173230
300	.724410	1000	2.414700
310	.748557	1100	2.656170

Heads in feet.	Horse power.	Heads in feet.	Horse power.
1	.0016 98	320	.515136
20	.032196	330	.531234
30	.048294	340	.547332
40	.064392	350	.563430
50	.080490	360	.579528
60	.096588	370	.595626
70	.112686	380	.611724
80	.128784	390	.627822
90	.144882	400	.643920
100	.16 980	410	.660018
110	.177078	420	.676116
120	.193176	430	.692214
130	.209274	440	.708312
140	.225372	450	.724410
150	.241470	460	.740508
160	.257568	470	.756606
170	.273666	480	.772704
180	.289764	490	.788802
190	.305862	500	.804900
200	.321960	520	.837096
210	.338058	540	.869292
220	.354156	560	.901488
230	.370254	580	.933684
240	.386352	600	.965880
250	.402450	650	1.046370
260	.418548	700	1.126860
270	.434646	750	1.207350
280	.450744	800	1.287840
290	.466842	900	1.448820
300	.482940	1000	1.609800
310	.499038	1100	1.770780

When the Exact Head Is Found in Above Table.

Example—Have 100 foot head and 50 inches of water. How many horse-power?

By reference to above table the horse-power of 1 inch under 100 feet

head is .241470. This amount multiplied by the number of inches, 50, will give 12.07 horse power.

When Exact Head Is Not Found in Above Table.

Take the horse-power of 1 inch under 100 foot head and multiply by the

number of inches, and then by number of feet head. The product will be the required horse-power.

The above formula will answer for the cubic feet table by substituting the equivalents therein for those of miner's inches.

Note.—The above tables are based upon an efficiency of 85 per cent.

FEET HEAD-POUNDS PRESSURE.

To reduce heads of water given in feet pressure in pounds per square inch, multiply the number of feet-head by the decimal .434.

EXAMPLE—The head being 600 feet, what is its pressure in pounds?

600 X .434 equals 260 pounds pressure.

The pressure being 260 pounds, what is its head?

$260 \div .434 = 600$ feet head.

An inch of rain on an area one mile square would amount to 17,424,000 gallons.

Melting Point and Specific Gravity of the Principal Metals.

	Centigrade	Fahr.	Sp. Gravity
Aluminum.....	700	1292	2.56
Antimony.....	432	809	6.71
Bismuth.....	258	464	9.83
Cadmium.....	320	608	8.60-8.69
Cobalt.....	1600	2912	8.06
Copper.....	1061	1995	8.85-8.95
Gold.....	1102	2015	19.5
Iron, cast.....	1530	2786	7.1-7.5
Iron, wrought.....	1808	3286	7.6-7.8
Manganese.....	1650	3002	7.4
Nickel.....	1537	2798	8.2-8.6
Platinum.....	1808	3286	21.5
Silver.....	1023	1873	10.5
Tin.....	223	442	7.28
Zinc.....	411	771	7.2
Lead.....	326	618	11.36

Arsenic does not melt, volatilizes at red heat, sp. gravity 5.62-5.96.

Quicksilver melts at 39°, evaporates slightly at ordinary temperature, and boils at 662°. Its specific gravity is 13.6 at 32°.

Scale of Hardness.

- | | | |
|---------------|----------------|--------------|
| 1. Talc. | 4. Flour Spar. | 7. Quartz. |
| 2. Gypsum. | 5. Apatite. | 8. Topaz. |
| 3. Lime Spar. | 6. Feldspar. | 9. Corundum. |
| | 10. Diamond. | |

Cost of Rare Metals per Avoirdupois Pound.

Gallium.....	\$68,600	Osmium.....	\$1,040
Vanadium.....	10,780	Uranium.....	980
Rubidium.....	9,800	Palladium.....	560
Thorium.....	8,330	Tellurium.....	490
Glucinum.....	5,800	Chromium.....	490
Calcium.....	4,900	Gold.....	340
Lanthanum.....	4,900	Molybdenum.....	245
Lithium.....	4,900	Platinum.....	122 30
Indium.....	4,410	Thallium.....	112
Tantalum.....	4,410	Iridium.....	36
Yttrium.....	4,410	Tungsten.....	28
Didymium.....	4,410	Potassium.....	18 80
Strontium.....	4,200	Selenium.....	5
Arium.....	3,675	Cobalt.....	4 50
Erbium.....	3,675	Magnesium.....	2 75
Ruthenium.....	2,695	Bismuth.....	2 50
Niobium.....	2,450	Sodium.....	2
Rhodium.....	2,460	Aluminum.....	1 10
Barium.....	1,960	Manganese.....	1
Titanium.....	1,152	Cadmium.....	40
Zirconium.....	1,040	Arsenic.....	160
Manganese, chemically pure, per lb....			

PROSPECTOR'S GOLD TABLE.

For Determining the Value of Free Gold per Ton [2000 lbs.] of Quartz or Cubic Yard of Gravel.

Weight Washed Gold.	Fineness 780.	Fineness 830.	Fineness 875.	Fineness 900.
4-lb Sample.	Value per oz. \$16 12.	Value per oz. \$17 15.	Value per oz. \$18 08.	Value per oz. \$19 01.
5 grains	\$83 97	\$89 36	\$94 20	\$99 05
4 "	67 18	71 49	75 86	79 24
3 "	50 36	53 61	56 52	59 43
2 "	33 59	35 74	37 68	39 62
1 "	16 79	17 87	18 84	19 81
.9 "	15 11	16 08	16 95	17 82
.8 "	13 48	14 29	15 07	15 84
.7 "	11 75	12 51	13 19	13 86
.6 "	10 07	10 73	11 30	11 88
.5 "	8 40	8 93	9 42	9 90
.4 "	6 71	7 14	7 53	7 92
.3 "	5 03	5 26	5 55	5 94
.2 "	3 36	3 57	3 76	3 96
.1 "	1 68	1 78	1 88	1 98

The above table furnishes an exceedingly simple method of determining the value of free gold in a ton of gold-bearing quartz, or a cubic yard of auriferous gravel.

Take a sample of four pounds of quartz, pulverize it to the usual fine-

ness for horning; wash it carefully by batea, pan or other means; amalgamate the gold by the application of quicksilver; volatilize the quicksilver by blow-pipe or otherwise; weigh the resulting button, and the value given in the table opposite such weight will be the value in free gold per ton of 2000 pounds of quartz.

EXAMPLE—If the sample of four pounds produces a button weighing one grain, the fineness of the gold being 830; then the value of one ton of such quartz will be \$17.87.

If the sample of four pounds should produce a button weighing, say four-tenths of a grain (.4), then the value of such quartz would be (830 fine) \$7.14 per ton.

Gold Value of a Cubic Yard of Gravel.

To determine the gold value of a cubic yard of auriferous gravel, the same table can be used.

Take a sample of 60 pounds of gravel, pulverize it, and carefully wash it by batea, pan, or otherwise; amalgamate the gold, volatilize the quicksilver; weigh the button, and in column in table, opposite the weight, will be found the gold value of the cubic yard of gravel.

EXAMPLE—Sample of 60 pounds produces a button weighing one grain, the fineness of the gold being 780; then the value of one cubic yard of such gravel would be \$1.67. This is arrived at by pointing off one point, or dividing the value given in table by 10.

If the sample of sixty pounds produces a button weighing five-tenths

(.5) of a grain, then the value of the gravel would be—gold being 780 fine—\$0.84 per cubic yard.

METRIC WEIGHTS AND MEASURES.

Metric Weights.

Milligram (1-1000 gram)	equals 0.0154 grain.
Centigram (1-100 gram)	equals 0.1543 grain.
Decigram (1-10 gram)	equals 0.5432 grains.
Gram	equals 15.432 grains.
Decagram (10 grams)	equals 0.5527 ounce.
Hectogram (100 grams)	equals 3.5274 ounces.
Kilogram (1000 grams)	equals 2.2046 pounds.
Myriagram (10,000 grams)	equals 22.046 pounds.
Quintal (100,000 grams)	equals 220.46 pounds.
Millier tonnea—ton (1,000,000 grams)	equals 2204.6 pounds.

Metric Dry Measures.

Milliliter (1-1000 liter)	equals 0.061 cubic inch.
Centiliter (1-100 liter)	equals 0.6102 cubic inch.
Deciliter (1-10 liter)	equals 6.1022 cubic inches.
Liter	equals 0.908 quart.
Decaliter (10 liters)	equals 9.08 quarts.
Hectoliter (100 liters)	equals 2.838 bushels.
Kiloliter (1000 liters)	equals 1.308 cubic yards.

Metric Liquid Measures.

Milliliter (1-1000 liter)	equals 0.0388 fluid ounce.
Centiliter (1-100 liter)	equals 0.338 fluid ounce.

Deciliter (1-10 liter) equals 0.845 gill.
 Liter equals 1.0567 quarts.
 Decaliter (10 liters) equals 2.6418 gallons.
 Hectoliter (100 liters) equals 26.418 gallons.
 Kiloliter (1000 liters) equals 264.18 gallons.

Metric Measures of Length.

Millimeter (1-1000 meter) equals 0.0394 inch.
 Centimeter (1-100 meter) equals 0.3937 inch.
 Decimeter (1-10 meter) equals 3.937 inches.
 Meter equals 39.37 inches.

Decameter (10 meters) equals 39.37 inches.
 Hectometer (100 meters) equals 328 feet 1 inch.
 Kilometer (1000 meters) equals 0.62137 mile (3280 feet 10 inches)
 Myriameter (10,000 meters) equals 6.2137 miles.

Metric Surface Measures.

Centare (1 square meter) equals 1550 square inches.
 Are (100 square meters) equals 119.6 square yards.
 Hectare (10,000 square meters) equals 2.471 acres.

THE NAMING OF ROCKS.

EXPLANATION OF TERMS.

Rocks are mineral aggregates, or in other words they are *inorganic substances* formed by the chemical or mechanical union of two or more minerals. Rocks, like minerals, exhibit different forms and various physical and chemical characteristics, certain terms are applied to rocks in accordance with these features, by which their appearance and structure are broadly expressed. For example: A rock, when sandy, is said to be *arenaceous*; or when it is clayey it is called *argillaceous*; when it contains much lime it is called *calcareous*; or much silica, it is termed *silicious*.

A *sedimentary* rock is one which has resulted from the chemical or mechanical precipitation of sediment.

An *aqueous* rock has been formed by the action of water.

An *igneous* rock is one which has its origin in fire, either directly or indirectly.

A *stratified* rock is one in which the lines of deposit are clearly marked in layers and such layers point to aqueous origin.

An *unstratified* rock, on the contrary; has no such lines, and with one or two exceptions such rocks are of igneous origin.

Metamorphic rocks are those in which some change has been induced due to crystallization after deposit. The term metamorphic is generally restricted to rock formerly of sedimentary or aqueous origin.

Crystalline is a term employed to express the structure of rocks. Many rocks which appear to the unaided eye to be compact or massive, under the microscope often exhibit complete crystalline structure.

Glassy, or *vitreous*, are terms used to express the presence of glass which

occurs in the bases of most all igneous rocks.

Porphyritic is the term employed to denote a structure in which a few crystals have separated themselves out and crystallized apart from the ground mass of the rock; a rock is said to be porphyritic especially when these crystals consist of feldspar.

Amygdaloidal rocks are those in which the almond-shaped vesicles have been filled up by other minerals brought in, probably by percolating water, such minerals are termed "*zeolites*."

Vesicular rocks are those containing spherical cavities.

Fluidal is a term applied to rocks of a wavy or streaky appearance; it is common in rhyolite, and marks the movement of particles in a once molten rock.

Schistose is the name given to a structure which has been induced in rocks by metamorphism. The structure consists in the arrangement in wavy, irregular lines and layers of the different minerals.

OOLITIC-PISOLITIC—*Oolitic* is the term used to explain the structure of a rock which is like the compact roe of a fish. When the grains are large the rock is called "*pisolitic*."

UNSTRATIFIED, METAMORPHIC AND ERUPTIVE ROCKS.

GRANITE—Composition, quartz, orthoclase and mica, metamorphic and eruptive. The chemical composition of granite agrees very nearly with that of some sandstone and clays, and there seems to be no reason to doubt that granites are merely altered por-

tions of the strata—portions which have been subjected to intense heat, movement and pressure. Granites occur either as intrusive veins or in hills and masses, varying from a small boss up to a large mountain range extending for many miles. It has been forced up through the earth's solid crust in a pasty, moist condition, from which, under varying circumstances, it has consolidated and crystallized. Granite is always newer or younger than the rocks it fissures or overlies; it is easily recognized and widely known; they are all visibly crystalline, the feldspar crystals varying from minute flakes up to crystals many inches in length. Granite passes into *gneiss* by pressure; the *gneiss* is virtually a granite of a schistose structure, the component minerals having arranged themselves more or less in layers.

G. = 2.5—2.8. Silica 70—72 p. c.

SYENITE GRANITE—A hard compact granite of a dark greenish to grayish color, the color resulting from the presence of the mineral hornblende, which partly replaces the micas.

Protogine is a softish granite containing pale green stains of chlorite and blotches of talc. It is *gneiss*-like in structure.

Luxulianyte is a softish flesh-colored granite in which mica is partly replaced by the impure subsilicate of alumina and *tourmaline*.

Granityte is a hard granite containing biotite mica in considerable quantities.

Granulyte is a granite, often soft and easily decomposed, in which the

quartz is very scarce or entirely absent. $G. = 2.6-2.7$. Silica 70-80 p. c. It contains no mica.

Greisen is a foliated soft granite with little or no feldspar. It is a schistose micaceous quartz rock.

Granite-porphry is a granite in which through some influence not understood, large isolated crystals separate themselves from the mass of felsite, which remains in a pasty magma; Composition, *felsite, quartz, feldspar, mica or chlorite*.

QUARTZ-PORPHYRY — Composition same as above, with no mica or chlorite, it is a hard, compact rock of various colors, generally gray to brown.

FELSYTE—A many-colored rock, from gray to bluish to brown and red; compact and very hard. It is a rapidly cooled granite paste, containing crystals of quartz and feldspar.

PITCHSTONE—A dark, glassy rock, with numbers of small crystals of glassy feldspar, and sometimes crystals of sanidin, quartz and mica. It is a glassy felsite which has cooled rapidly.

RHYOLYTE, OR QUARTZ TRACHYTE—A compact felsite with glass in the base, and quartz crystals and occasionally mica. Rhyolites are of many colors and textures, breaking with a rough fracture. They frequently exhibit wavy lines of structure (fluidal), caused by the arrangement in lines or layers of mineral aggregates or colored obsidian. They contain a large amount of quartz, which has resulted from the excess of silica not required to complete the feldspar crystals.

Pearlyte is a rapidly cooled rhyolite.

OBSEIDIAN—A black, brown, red or green volcanic glass, generally or most always of some dark color, looking and breaking like dark bottle glass.

PUMICE-STONE—A light, spongy, grayish rock, which floats on water. It is a volcanic foam, so to speak.

SYENYTE—A metamorphic and eruptive rock closely related to granite. It consists of orthoclase, hornblende, oligoclase, mica, nepheline, augite, and sometimes zircon. It is generally a grayish and flesh-colored rock, from the colors induced in it by its chief typical minerals, orthoclase and hornblende. Zircon syenite is rare and occurs chiefly in intrusive dykes.

$G. = 2.7-2.9$. Silica 58-63 p. c.

PORPHYRYTE—A volcanic rock, close-grained and breaking with an even fracture. It is formed almost entirely of feldspar with some magnetite. It is known by various names, according to the development of certain minerals. Mica-porphryte has much mica; hornblende-porphryte, much hornblende, etc. Porphyryte was largely outpoured during the carboniferous age, and would appear to be an imperfectly crystallized lava.

TRACHYTE—A rock of various colors, hard, but brittle, with rough fracture. It is the volcanic representative of syenite. It was originally poured out as a thick, viscous lava-stream. Sanidin is always well represented, which forms glassy crystals in the base. The minerals hornblende, augite, apatite, magnetite and titanite are often present. It is an orthoclase rock, with also oligoclase and crysolite.

$G. = 2.6-2.7$. Silica 60-64 p. c.

MINETTE—A volcanic rock consisting of biotite, orthoclase, nepheline and sodalite. It is a dark-colored felsitic rock in which biotite is an abundant mineral. It occurs chiefly in dykes and intrusive veins.

Silica 50—65 p. c.

PHONOLYTE - CLINKSTONE — A hard, compact rock, which rings under the hammer. Gray, grayish-blue, to brownish. It turns white by weathering. It consists of the minerals orthoclase (sanidin), nepheline, hornblende and titanite. It is a nepheline-trachyte, and often contains large and well-defined crystals of amphibole. Zeolites often occur, filling cavities in the mass. Both sanidin and nepheline show very clear, and their presence admit of approximate identification of the rock. The Cripple Creek District, Colo., is a noted locality of this rock, where in structure, it is more or less slaty.

QUARTZ-DIORYTE—Both a metamorphic and eruptive rock, consisting of quartz and plagioclase with hornblende. It is a very tough grayish to greenish-white rock, rich in silica. Its texture varies from coarse to fine-grained, often porphyritic. Called also *greenstone*.

G. = 2.66—3. Silica 50—64 p. c.

QUARTZ-PORPHYRY — An eruptive grayish to greenish rock, consisting of minutely crystalline paste of quartz, oligoclase, hornblende, with large crystals of the same, and titanite. It occurs in large masses, having probably been ejected through fissures. It is tough and coarse in fracture.

DACYTE (quartz-andesyte)—An eruptive, dull, grayish-green rock, com-

act but not hard, and consists of feldspar, hornblende, quartz, small crystals of oligoclase, sanidin and magnetite.

Silica 65—70 p. c. Often graduates into orthoclase rocks.

DIORYTE—An eruptive, coarse to fine-grained, compact rock; like syenite, in structure; color, light-gray and green to dark greenish black. Its typical constituents are: Orthoclase, feldspar, oligoclase and hornblende, with sometimes labradorite, apatite, magnetite and pyrite. When containing quartz, it is known as *quartz-dioryte*. The hornblende is easily recognized in the form of small needles, and the feldspar is more often flesh-colored than white. It occurs chiefly in wide dykes and fissures.

G. = 2.66—3. Silica 50—64 p. c.

ANDESYTE—An eruptive, hard, compact rock, consisting of the minerals, andesyte, crystals of augite or hornblende, biotite and magnetite, with labradorite as the chief feldspar. *Augite-andesyte* is a dark-gray nearly black rock, with dark-colored crystals of augite.

Hornblende-andesyte is a pale-gray, compact rock, where the dark-green hornblende crystals occur in small columnar forms. Occasionally the hornblende appears surrounded by pale-green stains, indicating its alteration into chlorite. Andesytes are of wide occurrence. They have been poured out from dykes and fissures. G. = 2.6—2.7. Silica 59—63 p. c. Has more or less the aspects of trachyte.

GABBRO—An eruptive rock, occurring in intrusive dykes and sheets. Its color varies from dark-gray,

blackish to brown, rusty red, and sometimes bright spangles of mica. Its chief mineral constituents are: Labradorite, diallage or pyroxene. Magnetite and mica are accessory minerals. The kind known as *olivine-gabbro* contains the mineral olivine as a constituent. *Hypersthenite* is a closely-related rock. Gabbro is widely distributed and often is associated with serpentine. Granite-like in texture. G. = 2.7—3.1.

DOLERYTE—A very hard, crystalline eruptive rock. Its color is always dark, from grayish and bluish to greenish-black and brownish-black. It is a crystalline variety of basalt, and consists of labradorite, augite, olivine, and often contains the minerals magnetite and apatite. G. = 2.75—3.1. Silica 50—55 p. c. Granitoid to aphanitic in texture

BASALT—A compact, minutely crystalline mixture of labradorite and augite, with olivine, magnetite and titanite. The olivine occurs in the base like green bottle glass. Basalt is very hard and of various shades and colors, from gray to black. It is a very common eruptive rock, filling volcanic vents, fissures, and occurring in vast sheets covering large areas of country. Basalt is often vesicular and assumes many columnar forms.

DIABASE—An ancient doleryte or crystalline basalt. It is composed of the minerals labradorite, augite, olivine and chlorite. It is a dark, compact rock, resembling doleryte and basalt, from which it can generally be distinguished by the presence of light-green patches of chlorite, arising from the decomposition of the

olivine constituent. No glass in base. Silica 53 p. c. Alumina, about 20 p. c.

BRECCIA—A rock formed out of the angular fragments ejected from volcanoes. It is of frequent occurrence in lava-flows. Some are of sedimentary origin (*Dana*). *Tufa*—A similar rock and of like origin, but with the fragments smaller. It is a fine sand conglomerate.

MICA-SCHIST—A foliated arrangement of quartz and mica; probably a schistose greisen-granite, or dioryte. The mica probably derived from the decomposition of the feldspar. It is generally associated with archæan rocks (*metamorphic*).

CHLORITE-SCHIST—Another metamorphic rock, consisting of a foliated arrangement of quartz and chlorite, containing also magnetite and mica. This rock is greenish in color and has a greasy feel. It is generally associated with gneiss.

HORNBLende-SCHIST—A foliated arrangement of quartz and hornblende, sometimes with orthoclase. It is dark-greenish in color, and is a schistose structure of amphibole or massive hornblende.

TALCose-SCHIST—An arrangement of quartz and talc in layers. It is light-green in color, very greasy to the touch, and occurs only in isolated beds. Metamorphic.

HYDROMICA-SCHIST—Commonly called *talcose-schist*. It is a chloritic-mica schist with water.

SOAPSTONE OR STEATITE—A highly compressed, schistose, massive talc, often impure; color, grayish-green.

gray and white. Easily cuts with a knife. Metamorphic.

SERPENTINE—A yellow, greenish-yellow, or green mottled rock, greasy to the touch and easily scratched with a knife. It is a result of the decomposition of olivine-bearing schists, the silicate of magnesia contained in the olivine rock having become hydrated (*i. e.* watered or moistened). Metamorphic.

STRATIFIED, SEDIMENTARY, OR AQUEOUS ROCKS.

SILT—A fine sediment which gathers in quiet waters, in hollow places of rivers, lakes, estuaries and seas.

ALLUVIUM, SILT, TILL—Alluvium is the earthy deposit made by running streams or lakes, especially during times of flood. *Silt* is the same material deposited in bays and harbors, where it forms the muddy bottoms and shores. *Till* is the unstratified sand, gravel and stones, with more or less clay, deposited by glaciers. Called also *unstratified drift*.

Detritus is a general term applied to earth, sand, alluvium, silt, gravel, because the material is derived, at a great extent, from the *wear* of rocks through disintegrating agencies, mutual attrition in running water, and other methods (*Dana*).

CLAY—An exceedingly fine-grained, soft, moist rock, formed of minute particles. It is the result of the decay of various aluminous silicates, always containing water. When quite pure it is white, but generally colored red, blue, green-gray, brown, etc., from the presence of various impurities.

MARL—A general term used for all compounds of lime and clay. When clay predominates they are called *clay marls*; when lime is in excess, *lime marls*. They are compact rocks, breaking with a conchoidal fracture. They are of various color, from liver-brown and red, red chiefly, and often contains nodules of limestone.

MUDSTONE—Massive, consolidated clay. It does not split into layers or laminae.

SHALE—A consolidated clay which splits into thin parallel laminae, which indicates various cessations and directions of the original deposition. Shale was probably deposited as *silt* in the beds of rivers, lakes, estuaries and seas. It is of various colors and shades, and often contains fossils.

SLATE—A hard, consolidated shale. It splits off into laminae, which have, however, nothing to do with the original planes of deposit, but are the result of cleavage. Color, gray, blue, green, purple, and sometimes black. *Roofing slate* is a compact kind which splits into very fine and even sheets.

ARGILLYTE—A slate in which more or less mica is present. The flakes of the mica occur in layers along the cleavage planes, a result of metamorphism.

SANDSTONE—Consolidated sand. It bears the same relation to sand as conglomerate does to gravel, and is the result of cementing action. Sandstones are composed principally or wholly of the mineral quartz. They are of various colors. *Calcareous sandstone* is a variety containing lime of a gray to white color.

CONGLOMERATE—Is gravel consoli-

dated into a compact mass, made up in part of rounded pebbles cemented together.

GRIT—A variety of sandstone more common in the older than in the later formations. It is composed of coarse, angular grains of quartz, which point to its arrangement in strata and consolidation in stone within a short space of time after its separation from its parent rock.

QUARTZITE—A compact, exceedingly hard rock, composed of granular quartz. It is a *metamorphic sand-stone*, and it occurs in interstratified beds.

FLAGSTONE—A sandy-slate, or a slaty-sandstone.

LOESS—A sandy, light-colored clay. It is dry and compact.

TILL—A glacial-age deposit of boulders, clay, etc.

FULLER'S-EARTH—A fine-grained argillaceous powder, when pulverized.

TRIPOLI-EARTH—A powdery rock, formed of minute frustules of diatom plants.

LIMESTONE—A grayish, yellowish or brownish rock of various degrees of purity. It is, when pure, formed of calcium carbonate which has been precipitated from water holding lime in solution. $H.=3$. $G.=2.25-2.75$.

STALACTITES—These are pendent, and *stalagmites* are upright, limestone. They may be of any size, from a mere thread up to a solid pillar many feet in length and diameter. They are the result of dripping lime water,

MARBLE—A granular or crystalline limestone, due to metamorphism. Of various colors, from white to gray,

with reddish and other tints. Impurities are mica, tremolite, pyroxene, scapolite, pyrite, serpentine, chlorite, spinel, graphite, etc. Varieties—Calcite, Dolomite and Calcite-Dolomite Marble.

CALCAREOUS-TUFA (TRAVERTINE)—A lime-carbonate deposit, formed by springs issuing from limestone and it is a sediment precipitated from their waters.

HYDRAULIC LIMESTONE—Contains a small portion of clay and has the property of hardening under water after being calcined or burnt.

DOLOMYTE (MAGNESIUM LIMESTONE)—A dirty grayish or yellowish rock. When pure, it consists of 54 per cent. magnesium-carbonate and 46 per cent. of calcium carbonate. It is compact but often assumes globular or other concretionary forms. It is harder than limestone and does not effervesce so freely in acids. When metamorphosed it makes an impure marble, frequently showing veins of iron oxide running through the ground mass.

QUARTZ—The mineral silica. It often occurs in veins, sheets and dykes, more especially in the older formations. It is of various colors, from pure white to gray, blue and even black.

SILICEOUS SINTER—A white, gray, light-pink or blue powdery deposit of almost pure silica, which has been deposited from hot geysers and mineral springs.

CRINOIDAL-LIMESTONE—A rock composed of the calcareous remains of

crinoids, shells, corals and other marine life.

CHALK--A soft, white, calcareous rock, formed entirely of the crumbled remains of foraminifera and other marine fossils.

CORAL--A rock formed of the accumulated remains of the coral insect.

PEAT--A dark-brown mass of compressed marshy vegetation. It is used as fuel.

The foregoing description of the *more common rocks* are aimed to assist the young miner in his work of identification, and to enable him to assign to each kind of rock its proper name wherever met with in nature.

(C. W. Moore's "Practical Guide for Prospectors, Explorers and Miners.")



A Few Mining Terms.

Adit--A level driven in the side of a hill and opening out into daylight.

Amalgum--The compound of mercury, (quicksilver) with gold or silver.

Anticlinal--When strata dip away from each other.

Arenaceous--Sandy.

Argillaceous--Clayey.

Auriferous--Containing gold.

Arrastra--Mill for grinding ore (Spanish term).

Bedrock--The strata underlying loose or drifted matter.

Cross cut--A level or tunnel driven towards a lode at right angles to its course.

Dip--The slope or inclination of a lode or bed from a horizontal line.

Drift--A tunnel driven from one part of the mine to another.

Dyke--A band of hard rock, usually igneous.

Eruptive--The name given to rocks that have burst through other rocks in a molten state, or that have been thrust up bodily.

Fault--A line of disturbance or dislocation in strata.

Flour Gold--The finest drift of gold.

Flume--An artificial water-course at hydraulic mines.

Foot-wall--The under wall of a lode.

Gap--A wedge for splitting rocks.

Galena--Sulphide of lead.

Gang or gangue--The non-metallic material filling lodes

Gulch--A deep ravine.

Hanging-wall--The upper wall of a lode.

Horse--The dead or barren ground by which a lode is sometimes cut into.

Level--Name given to a driving or adit underground along the course of a lode.

Lode--To lead a vein of mineral different from the enclosing rock, a fissure or crack filled with matter which may or may not be charged with metallic ore.

Ore--The substance specially containing metal.

Placer--Name given to gold diggings, or hydraulic mines.

- Quartz**--Pure silica in a crystalized form.
- Rise**--To work from the level upward.
- Shaft**--A pit sunk from the surface.
- Sluice**--A long trough with a loose riffled bottom, or bottoms with holes for the purpose of catching gold.
- Splintery**--Rocks that break into splinters or long sharp fragments are called splintery.
- Stope**--The workings of a mine between the levels assume the appearance of steps or stopes, and the miners working at these are stoping or stepping. When they are overhead like the underside pair of stairs, they are overhead stopes, when below the miner's feet they are underhand stopes.
- Stulls**--Timbers or staging on which waste is stored in the workings of a mine.
- Sulphide**--A combination of a metal with sulphur.
- Trace**--To follow the ledge on the surface and to lay it open by long pits.
- Wall of a lode**--See "Hanging wall" and "foot wall."
- Whim**--A drum with a vertical axis, with rope attached, worked by a horse for hoisting purposes from mines.
- Whip**--A bucket drawn up by means of a rope over a pulley, the rope being attached to a horse who moves straight forward.
- Winds or Winze**--A small shaft sunk or raised from one level to another underground.
- Zone**--Name given to a belt of strata, and to groups of strata distinguished by similarity of organic remains or mineral characteristics.

WAGES BY THE WEEK, 10 HOURS PER DAY.

Weekly Wages	Five Days.	Four Days.	Three Days.	Two Days.	One Day.	Half Day.	1/4th Day.	One Hour.	Half Hour.
\$ 2 00	\$ 1 66 $\frac{2}{3}$	\$ 1 33 $\frac{1}{3}$	\$ 1 00	\$ 66 $\frac{2}{3}$	\$ 33 $\frac{1}{3}$	\$ 16 $\frac{2}{3}$	\$ 08 $\frac{1}{3}$	\$ 03 $\frac{1}{3}$	\$ 01 $\frac{1}{2}$
2 50	2 08 $\frac{1}{3}$	1 66 $\frac{2}{3}$	1 25	83 $\frac{1}{3}$	41 $\frac{1}{2}$	21	10 $\frac{1}{2}$	04	02
3 50	2 91 $\frac{2}{3}$	2 33 $\frac{1}{3}$	1 75	1 16 $\frac{2}{3}$	58 $\frac{1}{2}$	29	14 $\frac{1}{2}$	06	03
4 00	3 33 $\frac{1}{3}$	2 66 $\frac{2}{3}$	2 00	1 33 $\frac{1}{3}$	66 $\frac{2}{3}$	33 $\frac{1}{3}$	16	06 $\frac{2}{3}$	03 $\frac{1}{2}$
4 50	3 75	3 00	2 25	1 50	75	37 $\frac{1}{2}$	18 $\frac{1}{2}$	07 $\frac{1}{2}$	03 $\frac{3}{4}$
5 00	4 16 $\frac{2}{3}$	3 33 $\frac{1}{3}$	2 50	1 66 $\frac{2}{3}$	83 $\frac{1}{3}$	41 $\frac{1}{2}$	21	08 $\frac{1}{3}$	04
5 50	4 58 $\frac{1}{3}$	3 66 $\frac{2}{3}$	2 75	1 83 $\frac{1}{3}$	91 $\frac{1}{2}$	46	23	09	04 $\frac{1}{2}$
6 50	5 41 $\frac{2}{3}$	4 33 $\frac{1}{3}$	3 25	2 16 $\frac{2}{3}$	1 08 $\frac{1}{2}$	54	27	11	05 $\frac{1}{2}$
7 00	5 83 $\frac{1}{3}$	4 66 $\frac{2}{3}$	3 50	2 33 $\frac{1}{3}$	1 16 $\frac{2}{3}$	58 $\frac{1}{2}$	29	11 $\frac{1}{2}$	06
7 50	6 25	5 00	3 75	2 50	1 25	62 $\frac{1}{2}$	31	12 $\frac{1}{2}$	06 $\frac{1}{2}$
8 00	6 66 $\frac{2}{3}$	5 33 $\frac{1}{3}$	4 00	2 66 $\frac{2}{3}$	1 33 $\frac{1}{3}$	66 $\frac{2}{3}$	36 $\frac{1}{3}$	13 $\frac{1}{3}$	06 $\frac{2}{3}$
9 00	7 50	6 00	4 50	3 00	1 50	75	37 $\frac{1}{2}$	15	07 $\frac{1}{2}$
10 00	8 33 $\frac{1}{3}$	6 66 $\frac{2}{3}$	5 00	3 33 $\frac{1}{3}$	1 66 $\frac{2}{3}$	83 $\frac{1}{3}$	41 $\frac{1}{2}$	16 $\frac{2}{3}$	08 $\frac{1}{3}$
11 00	9 16 $\frac{2}{3}$	7 33 $\frac{1}{3}$	5 50	3 66 $\frac{2}{3}$	1 83 $\frac{1}{3}$	91 $\frac{1}{2}$	46	18 $\frac{1}{2}$	09
13 00	10 83 $\frac{1}{3}$	8 66 $\frac{2}{3}$	6 50	4 33 $\frac{1}{3}$	2 16 $\frac{2}{3}$	1 08 $\frac{1}{2}$	54	21 $\frac{1}{2}$	10 $\frac{1}{2}$
14 00	11 66 $\frac{2}{3}$	9 33 $\frac{1}{3}$	7 00	4 66 $\frac{2}{3}$	2 33 $\frac{1}{3}$	1 16 $\frac{2}{3}$	58 $\frac{1}{2}$	23 $\frac{1}{2}$	11 $\frac{1}{2}$
16 00	13 33 $\frac{1}{3}$	10 66 $\frac{2}{3}$	8 00	5 33 $\frac{1}{3}$	2 66 $\frac{2}{3}$	1 33 $\frac{1}{3}$	66 $\frac{2}{3}$	26 $\frac{2}{3}$	13 $\frac{1}{3}$
17 00	14 16 $\frac{2}{3}$	11 33 $\frac{1}{3}$	8 50	5 66 $\frac{2}{3}$	2 83 $\frac{1}{3}$	1 41 $\frac{1}{2}$	71	28 $\frac{1}{2}$	14
20 00	16 66 $\frac{2}{3}$	13 33 $\frac{1}{3}$	10 00	6 66 $\frac{2}{3}$	3 33 $\frac{1}{3}$	1 66 $\frac{2}{3}$	83 $\frac{1}{3}$	33 $\frac{1}{3}$	16 $\frac{2}{3}$
21 00	17 50	14 00	10 50	7 00	3 50	1 75	87 $\frac{1}{2}$	35	17 $\frac{1}{2}$
25 00	20 83 $\frac{1}{3}$	16 66 $\frac{2}{3}$	12 50	8 33 $\frac{1}{3}$	4 16 $\frac{2}{3}$	2 04 $\frac{1}{2}$	1 08	41 $\frac{1}{2}$	20 $\frac{1}{2}$

STRAIN ON ROPE USED ON INCLINED PLANE.

For the benefit of those desiring to use wire rope on slopes, inclined planes, etc., we subjoin a table by which the strain produced by any load can easily be calculated.

The table gives the strain produced on a rope by a load of 1 ton of 2000 pounds, an allowance for rolling friction being made. An additional allowance for the weight of the rope will have to be made.

EXAMPLE: For an inclination of 25 feet in 100 feet, corresponding to an angle of 14.1-12 degrees; a load of 2000 pounds will produce a strain on the rope of 497 pounds, and for a load of 8000 pounds, the strain on the rope will be $\frac{497 \times 8000}{2000} = 1988$ pounds.

A factor of safety of five to seven times should be taken; that is, the working load on the rope should only be one-fifth to one-seventh of its breaking strength. As a rule, ropes for shafts should have a factor of safety of five, and on inclined planes, where the wear is much greater, the factor of safety should be seven.

Elevation in 100 feet.	Corresponding angle of inclination.	Strain in pounds on rope from a load of 2000 lbs.	Elevation in 100 feet.	Corresponding angle of inclination.	Strain in pounds on rope from a load of 2000 lbs.
5	2½°	112	95	43½°	1385
10	5½°	211	100	45°	1449
15	8½°	308	105	46½°	1457
20	11 1-5°	404	110	47½°	1487
25	14 1-12°	497	115	49°	1516
30	16½°	586	120	50½°	1544
35	19 1-5°	673	125	51½°	1570
40	21½°	754	130	52½°	1592
45	24½°	832	135	53½°	1614
50	26½°	905	140	54½°	1633
55	28 5-6°	975	145	55½°	1653
60	31°	1040	150	56½°	1671
65	33 1-12°	1100	155	57½°	1689
70	35°	1156	160	58°	1703
75	37°	1210	165	58 4-5°	1717
80	38½°	1260	170	59½°	1729
85	40½°	1304	175	60½°	1742
90	42°	1347			

Rates of Postage.

First-Class Matter--Letters, etc., 2c. an ounce.

Second-Class--Newspapers and Periodicals, 1c. for 4 ounces.

Third-Class--Books, Circulars, 1c. for 2 ounces.

Fourth-Class--Merchandise, 1c. an ounce.

Immediate Delivery Stamp--Additional to regular postage, 10 cents.

Postal Order--\$100 or less, each 3c. to 30 cents.

First-Class Matter--Letters and all other written matter (whether sealed or not), excepting manuscript copy accompanying proof-sheets; also all matter sealed (see below), 2 cents an ounce, excepting drop letters at non-carrier offices, 1 cent an ounce.

Second-Class--Newspapers and periodicals, published quarterly and oftener, and not for gratuitous distribution. The general public pay by affix-

ing stamps at the rate of 1 cent for each 4 ounces, or part thereof when not sealed.

Third-Class—Books (printed, not blank), circulars, other printed matter, proof-sheets and manuscript copy accompanying same, valentines, sheet-music, heliotypes, chromos, lithographs and printed advertising matter in general, all, when not sealed, 1 cent for 2 ounces or fraction.

Fourth-Class—Ores, merchandise and samples, including printed matter in quantity, blank books and paper, all matter not included in any of the other classes, and not in its nature perishable or liable to injure the contents of the mails. (By express ruling the postage on seeds, cuttings, roots, scions and plants is at the rate of 1 cent for each 2 ounces.) All, when not sealed, and not exceeding 4 pounds in weight, 1 cent an ounce or fraction.

Sealing—Any matter is regarded as sealed when it is not so wrapped as to allow of a thorough examination without in any way injuring the wrapping or contents. The name and address of the sender and a description of the contents can be written on the wrapper of unsealed packages, or a business card may be printed, pasted or impressed on such a wrapper.

Postage to Canada and Mexico—Same as domestic rates, excepting fourth-class matter to amount of 4 pounds 6 ounces, with the exception of liquids, pastes, confections and fatty substances and publications which violate any copyright law. To Canada, except sealed packages. To Mexico, except sealed packages and liquids. Commercial papers to both countries at usual rates.

Antidotes for Poisons.

Induce vomiting, by tickling throat with a feather or finger; drinking hot water or strong mustard and water. Swallow sweet oil or whites of eggs.

Acids are antidotes for **Alkalies**, and *vice versa*.

POISONS.	ANTIDOTES
Acids —Oxalic, Mur- iatic, Acetic, Sul- phuric (Oil of Vit- rol), Nitric (Aqua Fortis.	Soap-suds, Mag- nesia , limewater.
Prusic Acid.	Ammonia in water Dash water in Face.
Carbolic Acid.	Flour and Water. Mucilaginous drinks.
Alkalies —Potash, Lye, Hartshorn, Ammonia.	Vinegar or lemon juice in water.
Arsenic —Rat Poi- son, Paris Green.	Milk, raw eggs, sweet oil, lime- water, flour and water.
Bug Poison —Lead, Saltpeter, Corro- sive Sublimate, Sugar of Lead, Blue Vitrol.	Whites of eggs, or milk in large doses.
Chloroform —Chlo- ral, or Ether.	Dash cold water on head and chest. Artificial respira- tion.
Carbonate of Soda —Coperas, Cobalt	Soap-suds and mu- cilaginous drinks
Iodine —Antimony, Tartar Emetic.	Starch and water, astringent infu- sions, strong tea.
Mercury and its Salts.	Whites of eggs, milk, mucilages.
Opium —Morphine, Laudanum, Pare- goric, Soothing Powders or Syr- ups.	Strong coffee, hot bath. Keep awake and moving at any cost.

STATE GAME LAWS.

The following is a summary of the laws of Oregon providing for the protection of fish and game:

MAMMALS.

Beaver—Unlawful to hunt or kill before 1919.

Deer—Closed season, between November 1 of each year and August 15 of the following year. Use of dogs prohibited. Unlawful to hunt or kill between one hour after sunset and half an hour before sunrise, at any time of year, unless carcass is used or preserved for food. Sale prohibited.

Elk—Unlawful to hunt or kill before September 15, 1904.

Fawn (Spotted)—Unlawful to hunt or kill at any time.

Moose—Closed season, between November 1 of each year and August 15 of the following year. Sale prohibited.

Mountain Sheep—Closed season, between November 1 of each year and August 15 of the following year. Sale prohibited.

Silver Gray Squirrel—Closed season, between January 1 and October 1 of each year.

BIRDS.

Ducks, Geese, Swan—Except in the counties of Jackson, Klamath and Lake, unlawful at any time between March 1st, and September 1st, to kill, sell or exchange any wild goose, wild swan, Mallard duck, Wood duck, Widgeon, Teal, Spoonbill, gray, black, Sprigtail or Canvasback duck.

Closed season in Jackson, Klamath and Lake, between January 1st, and September 15th of any year.

One hundred largest number to be shot in one week, or not more than 50 in a day.

Unlawful at any time to kill wild goose on any island or sand bar, in or along the Columbia River, or within Oregon east of Cascade Mountains, county of Coos, excepted. Close season in that county August 1st, to February 1st.

Close season for Water Rail and Upland Plover between January 1st, to August 1st, of any year.

Unlawful at any time to use any sinkbox, sneakboat, skiff or other boat on Columbia River or any of its tributaries (except the Willamette and its tributaries above Oregon City) in the State of Oregon, for the purpose of shooting wild duck, geese, swan, or other water fowl therefrom. Or to use the same on any waters in the State of Oregon.

Unlawful to use any battery, swivel or pivot gun, or other gun, except held in hands and fired from shoulder, fire and flashlight, etc.

It is unlawful at any time between one hour after sunset and one half hour before sunrise to fire off any gun, or build any fire, or flash any light, or burn any powder or other inflammable substance upon the margin or in the vicinity of any lake, pond, slough or feeding ground frequented by wild ducks, geese, swan or other water fowl.

It shall be lawful to shoot ducks and geese in or upon grain fields at

any time to prevent destruction of growing grain.

Unlawful to build or use blinds which stand out 100 feet, or other structures in any public lake or river in the State of Oregon, which is not wholly owned by said person, for purpose of shooting wild ducks, geese, swan, or other water fowl therefrom at any time.

Close season for prairie chickens, grouse, native pheasant or ruffed grouse, ring-neck or China torquatus pheasant, quail, bobwhite, and partridge, except as specially stated later—December 1st, to October 1st, to hunt, pursue, kill, injure or destroy or have in possession (except for scientific or breeding purposes), or to sell or offer for sale, exchange—No one person to kill more than ten game-birds enumerated in one day.

Douglas county close season for prairie chicken, native pheasant, ring-neck or China torquatus pheasant, quail, bobwhite quail and partridge, December 1st, to September 1st. Grouse, ruffed grouse, between December 1st. and August 1st. Limit, ten birds.

East of Cascade mountains, except in the county of Wasco, unlawful to hunt or kill any pheasant, except native pheasants (sometimes called ruffed grouse) or any quail, except bobwhite quails or any sage hen, sage cock, at any time between November 1st, and August 1st.

East of Cascade mountains except county of Wasco, not lawful to kill at any time between the date of passage of this act and August 15th, 1903. Close season thereafter for prairie chicken, November 15, to August 15.

East of Cascade mountains, except in Klamath and Lake counties, not lawful to kill at any time between the date of passage of this act and October 15, 1905. Close season thereafter for bobwhite quails, December 1, to October 15.

Wasco county, close season for prairie chicken, Oct. 15, to Aug. 1, or any time when ground is covered with snow sufficient for tracking or hunting. Close season for quail, Oct. 15, to Aug. 1st.

Tillamook county, not lawful to kill at any time between the passage of this act and Sept. 15, 1904. Close season thereafter for any native pheasant, or any ring-neck or China torquatus pheasant, Dec. 1st, to Sept. 15. Close season for blue grouse, Oct. 15 to Aug. 1st.

Counties of Josephine, Jackson, Coos, Curry and Clatsop, not lawful at any time between the passage of this act and Sept. 15, 1904, to hunt, pursue or kill any ring-neck or China torquatus pheasant. Closed thereafter from Dec. 1st, to Sept. 15th.

Unlawful at any time between date of passage of this act and Oct. 1st, 1905, to hunt, pursue or kill any english or gray partridge, capercaillie, moor hen wild turkey, woodcock, silver pheasant, golden pheasant, copper pheasant, green Japanese pheasant or Reeves pheasant. Close season thereafter, from Dec. 1st, to Oct. 1st.

Sale of grouse, pheasant and quail only allowed during the last fifteen days of open season.

Unlawful at any time to trap, net or ensnare, or attempt to trap, net or ensnare, any of the wild animals, wild

fowl or game-birds enumerated in this act.

Unlawful to use poisoned wheat or other poisoned grain for the purpose of poisoning wild fowl or game-bird enumerated.

Unlawful for any person to enter any standing or growing grain, or enclosed premises with intent to catch, recover or kill any bird or wild fowl or wild animal, or permit any dog or dogs with which said person is hunting, without permission of person in charge of such premises.

Unlawful to have game birds in possession during period when it is unlawful to take, kill or destroy.

Cold storage companies or persons are forbidden to have in their possession, any of the wild animals, fowls, birds or fish, out of season.

Unlawful for non-residents to hunt, pursue, take or kill any species of game, birds or animals for marketing purposes, without first having obtained a license from State Game and Forest Warden.

FISH.

Unlawful to take, catch, kill or have in possession any black bass during January, February, March, April, May, October, November and December of any year. Law prohibits any way except hook and line.

Unlawful to fish for trout during November, December, January, February. Unlawful at any time to take, catch, kill any trout or salmon less than five inches in length. Fishing with hook and line.

Unlawful to fish for salmon-trout by any means whatever except hook and line, in any other than tide wa-

ters during November, December, January, February, and March.

Sale of trout prohibited.

Night fishing prohibited between one hour after sunset and one hour before sunrise.

Catch of trout in one day limited to 125 fish.

Unlawful at any time between time of passage of this act and April 1st, 1914, to catch or kill by any means whatever, any Eastern brook trout, Loch Leven trout or grayling.

Unlawful to explode or cause to be exploded, any giant powder, dynamite or other explosives in any lake, stream, pond, bay or waters within boundary of this State.

Unlawful to poison fish in any way, or to have in possession any trout, salmon or other game fish which have been killed by means of lime, or cocculus or other poison, or by giant powder or other explosive.

Unlawful for any sawmill or any employe to cast or throw sawdust, shavings or lumber waste, in any waters of the State, or deposit same where high water will take the same into any of the waters of the State.

FINES AND PENALTIES.

GENERAL FINES.—\$15.00 to \$200.00 and cost of prosecution, or imprisonment in county jail from 7 to 100 days.

DEER FINES.—\$25.00 to \$500.00 and cost of prosecution, or imprisoned in county jail 30 to 120 days.

TROUT FINE.—\$20.00 to \$100.00 and cost of prosecution, or imprisoned in county jail 10 to 15 days.

SAWDUST FINE.—\$25.00 to \$150.00 and

cost, or imprisoned in county jail 10 to 90 days.

DYNAMITE FINE.—\$200.00 and imprisonment in county jail 30 days to one year.

Second offense, \$1,000.00 to \$3,000.00 and imprisoned in penitentiary not less than one year nor more than three years.

COLD STORAGE AND TRANSPORTATION FINE.—\$100.00 to \$500.00 and costs, or imprisoned in county jail 30 to 120 days.

FINES COLLECTED.—One half of all such money exclusive of costs, go to informer, whether said informer be sheriff, constable, city marshal, police officer or other person, other than State Game and Forestry Warden or special deputy. The other half of fine goes to county treasurer to be applied to the payment of the expenses of such suit or action. All above such costs goes to State Treasury.

Help for Accidents.

Drowning.—1. Loosen clothing, if any. 2. Empty Lungs of water by laying body on stomach and lifting it by the middle so that head hangs down. Jerk the body a few times. 3. Pull tongue forward, using handkerchief, or pin with string if necessary. 4. Imitate respiration by alternately compressing and expanding the lower ribs, about 20 times a minute. Alternately raising and lowering the arms from the sides up above the head will stimulate the action of the lungs. 7. Don't give up. People have been saved after hours of patient vigorous effort. 8. When breathing begins, get patient into a warm bed,

give *warm* drinks, or spirits in tea-spoonfuls, fresh air and quiet.

Burns and Scalds.—Cover with cooking soda and lay wet cloths over it/ Whites of eggs and olive oil. Olive oil or linseed oil, plain, or mixed with chalk of whiting. Sweet or olive oil and lime water.

Lightning.—Dash cold water over person struck.

Sunstroke.—Loosen clothing. Get patient into shade, and apply ice-cold water to head. Keep head in elevated position.

Mad Dog or Snake Bite.— Tie cord tight above wound. Suck the wound and cauterize with caustic or white-hot iron at once, or cut out adjoining parts with a sharp knife. Give stimulents, as whiskey, brandy, etc.

Stings of Venimous Insects, Etc.— Apply weak ammonia, oil, salt water, or iodine.

Fainting. Place flat on back; allow fresh air and sprinkle with water. Place head lower than rest of body.

Cinders in the Eye.—Roll soft paper up like a lamplighter, and wet the tip to remove, or use a medicine dropper to draw it out. Rub other eye.

Fire in One's Clothing.—Don't run; especially not down-stairs or out-of-doors. Roll on carpet or wrap in woolen rug or blanket. Keep the head down so as not to inhale flame.

Fire in a Building.—Crawl on the floor. The clearest air is the lowest in the room. Cover head with woolen wrap, wet if possible. Cut holes for the eyes. Don't get excited.

Fire from Kerosene.—Don't use water it will spread the flames. Dirt,

sand or flour is the best extinguisher, or smother with woollen rug, table cloth or carpet.

Woodticks.—The best remedy for woodticks when once they have buried themselves in one's flesh is pure alcohol.

Poison Oak.—Carbolic acid and bromide of potash made in a salve; or sugar of lead.

Snake Bite.—Tie a tight ligature between the bite and the heart, within two or three minutes after being bitten; loosen ligature every half hour, momentarily, and reapply instantly, repeating several times; squeeze wound well and apply cupping glass (a wide mouthed bottle heated very hot will serve), or suck venom out if teeth are sound and no abrasion on mouth or tongue; give whisky or brandy in ounce doses at intervals of three to five minutes; avoid profound intoxication; if stomach is empty half a pint (one cup) mixed with water is generally sufficient.

Future Tax Collecting.

The following is a synopsis of the law regulating tax collections hereafter, which was passed by the last legislature:

Taxes which are paid on or before the 15th of March succeeding the date of the levy will be allowed a rebate of three per cent. provided that the rolls reach the sheriff prior to that date.

Taxes paid between the 15th and 31st, both dates inclusive, will not be allowed any rebate, but neither will any penalty of interest be added thereto.

Taxes become delinquent after the

first Monday in April and there will be added immediately thereto a penalty of ten per cent. and also interest at the rate of twelve per cent. per annum in addition to the penalty.

If one-half of the taxes are paid on or before the first Monday in April, then the payment of the remainder may be deferred up to the first Monday in October; but if not then paid it shall become delinquent and subject to a penalty of ten per cent. and interest at the rate of twelve per cent. per annum from the first Monday of the preceeding April.

On all personal property taxes the law compels the sheriff to make levy and collect the same after April 1st, unless one-half thereof shall have been paid on or before the first Monday in April.

The law compels the sheriff to sell all lands on which taxes have not been paid and provides that tax sales shall be made not later than March 1st of the year succeeding that in which the levy shall have been made.

Property will be sold to the persons bidding the lowest rate of interest, and certificates will be issued therefor, and deeds given to the property three years after such sale, unless the property shall have been sooner redeemed.

Nutritiveness of Foods.

Average quantity of nutritive matter in 1000 parts of several varieties of animal and vegetable food:

Cucumber.....	25	Gooseberry.....	190	Chicken.....	270
Melons.....	30	Peaches.....	200	Plums.....	290
Turnips.....	42	Codfish.....	210	Mutton.....	290
Milk.....	72	Sole.....	210	Tamarinds.....	340
Cabbage.....	73	Pork.....	240	Almonds.....	650
Carrots.....	98	Cherries.....	250	Oats.....	742
White of Egg.....	140	Veal.....	250	Rye.....	782
Beet-root.....	148	Reef.....	260	Rice.....	880
Pears.....	160	Potatoes.....	260	Barley.....	920
Apples.....	170	Apricots.....	260	Wheat.....	950
Haddock.....	180	Grapes.....	270		

POPULATION OF U. S. BY STATES.

STATES.	1900	1890	1880
Alabama	1,828,697	1,513,017	1,262,595
Arizona	122,931	59,620	40,440
Arkansas	1,311,564	1,128,179	802,525
California	1,485,053	1,208,130	864,614
Colorado	539,700	412,198	194,327
Connecticut	908,355	746,258	622,700
Delaware	184,735	118,493	146,608
District Columbia	278,718	230,392	177,624
Florida	528,542	391,422	269,493
Georgia	2,216,331	1,837,353	1,542,180
Idaho	161,772	84,385	32,610
Illinois	4,815,550	3,816,351	3,077,871
Indiana	2,516,462	2,192,404	1,978,301
Iowa	2,231,858	1,911,896	1,624,615
Kansas	1,470,495	1,427,096	996,096
Kentucky	2,147,174	1,858,635	1,648,680
Louisiana	1,341,625	1,118,587	939,946
Maine	691,466	661,086	648,936
Maryland	1,190,050	1,042,390	934,943
Massachusetts	2,805,346	2,238,943	1,783,015
Michigan	2,420,982	2,093,889	1,636,937
Minnesota	1,751,394	1,301,826	780,773
Mississippi	1,551,270	1,289,600	1,131,597
Missouri	3,106,665	2,679,184	2,168,380
Montana	243,329	132,159	39,159
Nebraska	1,008,589	1,058,910	452,402
Nevada	42,335	45,761	62,266
New Hampshire	411,588	376,530	346,991
New Jersey	1,883,669	1,444,933	1,131,116
New Mexico	193,210	153,593	119,565
New York	7,268,012	5,997,853	5,082,871
North Carolina	1,803,810	1,617,947	1,399,750
North Dakota	319,146	182,719	139,750
Ohio	4,137,545	3,672,316	3,198,062
Oklahoma	398,245	61,834
Oregon	413,586	313,767	174,768
Pennsylvania	6,302,115	5,258,014	4,282,891
Rhode Island	428,556	345,506	276,321
South Carolina	1,340,316	1,151,149	995,877
South Dakota	401,570	328,808
Tennessee	2,020,616	1,767,518	1,542,359
Texas	3,048,710	2,235,523	1,591,749
Utah	276,749	207,905	142,963
Vermont	343,641	332,422	332,286
Virginia	1,854,184	1,655,980	1,512,565
Washington	518,103	349,390	75,116
West Virginia	968,800	762,764	618,457
Wisconsin	2,069,042	1,686,880	1,315,497
Wyoming	92,531	60,703	20,789
Alaska	63,441	32,052
Hawaii	154,001	89,990
Indian Territory	391,960	180,182
TOTAL	76,215,129	62,924,474	50,020,606

Some Large Cities of the U. S.

Baltimore, Md.	508,957
Boston, Mass.	560,892
Chicago, Ill.	1,691,575
Cincinnati, Ohio	325,902
Cleveland, Ohio	381,768
Detroit, Mich.	285,704
Buffalo, N. Y.	325,387
Jersey City, N. J.	206,433
Louisville, Ky.	204,731
Los Angeles, Cal.	102,479
Milwaukee, Wis.	285,315
Minneapolis, Minn.	202,718
Newark, N. J.	246,070
New Orleans, La.	287,104
New York, N. Y.	3,437,202
Philadelphia, Pa.	1,293,697
Pittsburg, Pa.	321,616
Portland, Ore.	90,426
St. Louis, Mo.	575,238
San Francisco, Cal.	342,782
Seattle, Wash.	80,671
Spokane, Wash.	36,848
Tacoma, Wash.	37,714
Washington, D. C.	278,718
St. Paul, Minn.	163,065

Foreign Rates of Postage.

The usual rates of postage to all parts of Europe, Persia, India, Egypt, Turkey, Japan, Bermudas, Honduras, Brazil, Chili, Peru, Argentine Confederation, Venezuela, Ecuador and Newfoundland, for letters, is 5 cents per half ounce, or fraction thereof. Prepayment is optional. If not prepaid, however, a fine is collected on delivery. An additional fee of 2 cents is charged for each order, as a special war tax.

One cent extra is required on all foreign postal cards. Newspapers, 2 cents for each four ounces, or fraction thereof. On all other printed matter, and sample, 1 cent for each two ounces, or fraction thereof, and an additional 1 cent for each package. The least postage, however, on any such package is 5 cents. All matter, except letters, must be fully prepaid. By a prepayment of 10 cents extra, all mailable packages may be registered.

Principal Oregon Cities and Towns.

The census of 1900 gave the following as the population of the principal cities and towns in Oregon:

Albany	3,149	McMinnville	1,420
Ashland	2,634	Medford	1,791
Astoria	8,381	Oregon City	3,494
Baker City	6,663	Pendleton	4,406
Corvallis	1,819	Portland	90,426
Eugene	3,226	Roseburg	1,691
Grants Pass	2,290	Salem	4,258
La Grande	2,691	The Dalles	3,545