

Raymond Reports on OREGON
Mineral Production - 1869 + 1870

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STATISTICS
of
MINES AND MINING
in the
states and territories
WEST OF THE ROCKY MOUNTAINS

BY
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SECTION III -- OREGON

Chapter XXII
GENERAL REMARKS

The natural resources of this State, aside from mining, are set forth in the report of J. Ross Browne (1868) with comprehensive clearness. In climate, soil, navigable rivers and harbors, Oregon is highly favored, and creditable progress has been made by her citizens in the development and utilization of these advantages. The attractions of the State are indeed so great and so generally known, that a stream of immigration is constantly pouring into it, and would continue to do so, if there were no mines to be worked for gold and silver in that region. In many parts of Oregon, however, as elsewhere on the Pacific coast, mining has been the pioneer of settlement and civilization. It may confidently be expected that the growth of a diversified industry will react favorably on that branch which gave the first impetus.

Mr. Browne's report describes the great iron deposits of the State. I regret to say that the manufacture of iron is not yet successfully established, though the quality and abundance of the ore leave nothing to be desired. The difficulty lies in the high price of labor, and can only be remedied by the employment of Chinese. The woolen manufacture, into which Chinese labor has already been introduced, is thriving and extending.

Coal is found in Columbia, Clatsop, Coos, Tillamook, Benton, Jackson, Douglas, and Clackamas Counties. A considerable export has sprung up, and coal mining promises to become a stable and profitable business. The abundance and excellence of the lumber of Oregon are well known. The salmon fisheries of the Columbia are a source of considerable revenue. The gross receipts of the salmon catch of last season are estimated at not less than \$275,000.

One of the prominent industries of the State is stock-raising. Oregon horses are highly prized throughout the Pacific States and Territories, and Oregon cattle are driven in great numbers south into less favored regions.

With this slight preliminary allusion to the frequently described natural resources of the State, I proceed to consider more at length its mineral wealth, especially with respect to gold and silver, principally the former.

The production of Oregon and Washington is usually reconed together, as the shipments of the latter Territory are made to Portland. The treasure shipments of Wells, Fargo & Co., from their Portland office, have been as follows:

	1864	\$6,200,000
	1865	5,800,000
	1866	5,400,000
	1867	4,000,000
1868	January	\$195,000
	February	145,000
	March	140,000
	April	150,000
	May	230,000
	June	355,000
	July	280,000
	August	405,000
	September	414,000
	October	270,000
	November	285,000
	December	268,000
	Total	<u>3,037,000</u>

The bullion shipments of Messrs Ladd and Tilton, bankers of Portland, during 1868, amounted to \$640,850. As Jackson and Josephine Counties do not always ship to Portland, there is a considerable sum to be added for those counties, while, on the other hand, there are some deductions necessary for gold from Idaho, finding its way to the Columbia. My estimate of \$4,000,000 for the yield of Oregon and Washington in 1868 is still as near to the truth as I can attain, and is generally recognized as a close approximation.

Mr. Samuel C. Mills, agent of Wells, Fargo & Co., at Portland, favors me with the following table of shipments for 1869:

January	\$154,000
February	75,000
March	85,000
April	181,000
May	316,000
June	257,000
July	201,000
August	202,000
September	253,000
October	260,000
November	301,000
December	274,000
Total	<u>2,559,000</u>

The following amounts represent the bullion shipment of Messrs. Ladd & Tilton during 1869:

January	\$51,613 46
February	3,336 48
March	16,815 36
April	21,137 91
May	50,743 12
June	55,493 26
July	28,384 36
August	54,706 18
September	19,979 24
October	50,140 57
November	24,641 23
December	42,666 13
Total	<u>419,657 30</u>
Total Wells, Frago & Co	\$2,559,000 00
Total, Ladd & Tilton	419,657 30
Private hands (Mr. Mills's estimate)	480.00
Total	2,979,137 30

Mr. Mills remarks: It is impossible for me to say what proportion of the above belong exclusively to this state, as Idaho, Montana, and British Columbia bullion reaches this city. Possibly one-half of the above amount belongs to Oregon.

To this I would remark that Mr. Mills's estimate only covers the shipments from Portland, whereas one principal placer district (That of Josephine and Jackson Counties) probably ships its bullion overland to Sacramento and San Francisco. On the whole, therefore, I feel justified in placing the production of Oregon and Washington at \$3,000,000 a decrease of \$1,000,000 as compared with 1868.

CHAPTER XXVII THE GEOLOGY OF OREGON

The public expenditures of Oregon have thus far been conducted on a scale of economy too stringent to allow any expectation of such a luxury as a State geological survey. A few brief notices of the geology of the Columbia basin, published in connection with railroad surveys, give the Columbia basin nearly the all that is accessible to the public of the geological record of that extensive region. And yet the country

is rich in geological material, opening a field whose harvests are destined to be better known. The ancient Columbia River flowed through and from regions covered to an extraordinary extent with vast bodies of fresh water. No other water shed of like extent has so worn down the channels of its streams as to have drained off nearly the whole of its lake system; while through the now dry beds of those ancient lakes existing streams have still further excavated, until the whole is all laid bare and open to the researches of the curious.

On entering the Columbia from the ocean, the facts that give the key to its geology stand out bold and clear in the outline of its extended landscape. Two groups of mountains are in sight, each of which, in turn, once formed a formidable barrier to the passage of that river to the sea. On our right and left, as we enter, we see one of these groups in the subdued highlands that here represent the northern extension of the Coast Range. Further on, one hundred and fifty miles eastward, we see the other group in the more elevated, snow-capped summits of the Cascade Mountains. How like two vast tidal waves these two ranges of mountains seem, as if rolled inland from the great Pacific, and petrified in their progress into a rocky skeleton for a new land. And such, in fact, they became. They bear now upon their elevated table lands the records of the ages they spent beneath the waters of the ocean; the records of the time and the manner of their emergence from the waters cover, often with alternating slope and terrace, their sides; while the deep depressions between them contain like evidence that they once held the inland seas in which, for a long period thereafter, were deposited the remains of marine plants and animals of that period. The corresponding depressions east of the Cascade range, shut off from all access to the ocean, soon lost the saltiness of their waters, and therefore only contain the record of fresh-water life.

These wrinklings or flexures of the earth's crust which folded its rocky masses into mountain ranges, were not the only application of the working forces of that age. There occurred, also, a general elevation of the whole of the now western slope of the continent, giving greater descent and consequent wearing force to its streams; and, as a result, the rapid wearing of their channels deeper, until many of its lakes were drained off. Now, as these streams have never since that time ceased to flow, and as the lakes into which they flowed, or from which they sprung, ever, as long as they remained such, ceased to deposit, in the sediment of their floods, the history of the life-struggle upon their shores, or in their waters, the resulting records of these natural archives must have continued in uninterrupted series.

If this brief introduction be at all true to the facts of the case, then two plain and important truths force themselves upon us; One, that the emergence of its mountain ranges from the bed of the ocean forms a natural epoch in the geology of Oregon. The other, that an uninterrupted series of chapters in its record of the past is found in the now elevated sediment of its former inland seas and lakes.

Let us endeavor to get hold of the thread of this record at the point where it touches upon our own, and trace it backward into the distant past, as far as we may, unbroken. But, before consulting the earth itself for the facts that tell of past changes, and of the forms of life that existed long ago, a single Indian tradition, founded upon a belief among the Indians of the Lower Columbia of recent changes in the levels of that river, will not be uninteresting---perhaps not uninteresting. The legend states that formerly the Columbia River was navigable for canoes from the Chinook villages at its mouth to the Dalles, where a perpendicular fall of twelve or fifteen times the height of a tall man arrested even the ascent of the salmon, and compelled the Indians of the interior to journey to the Dalles for their fish, to trade for which they brought dried buffalo meat and buffalo robes.

The legend further states that a massive natural bridge then spanned the river at the present Cascades. That this state of things was suddenly brought to a close by a quarrel between Mount Hood and Mount St. Helen's during which they belched forth fire and smoke at each other, and cast heavy rocks, with such noise and quakings of the earth as to shake down the bridge. That the ruins of the bridge form the present Cascades, having also dammed up the water above so much as to take away almost all of the upper fall at the Dalles, and so permit the salmon to pass over that fall and away into the interior, which they have continued to do ever since. Such is the Indian legend.

Let us return to the geological record. We were to take up the thread of that record at the point where it touched our own---the human. But where do we find the last foot-mark of the human record from which we have agreed to take our start? On the island of Guadeloupe the last human foot mark in the dim receding distance of the past is found imbedded in the solid limerock of the seashore; in Florida it is found inclosed in an ancient coral reef so remote from the seashore as to have required a long period of growth in the land since it was impressed there; in Switzerland the remotest traces of human life are lost among the ruins of the wonderful and ancient "Lake Dwellings" of that wonderful country; in Belgium and England they are found incased in the stalagmites of ancient cave dwellings; in France, buried among the gravelbeds of the valley of the Somme, in the form of rude stone implements of industry; upon the banks of the Mississippi, buried under cypress forests of untold ages; and in California, where that world renowned Calaveras skull was found, startling the world with a story of antiquity beyond them all. When we turn from such a list to Oregon's record, and ask, where does the geological record of this State place the remotest foot-mark of human life? we are constrained to admit that upon this question of human antiquity Oregon's geology furnishes, as yet, but little light. This may be, in part owing to the few extensive excavations of public works here. In some instances, too, where fossil bones were found, much care may not have been exercised in search of human remains. In most of the instances of such discovery, however, it was otherwise; for the greatest care and diligence were used to detect the least sign of former human life.

Nothing has yet come to light in the geology of Oregon to show that the record of human life here reaches any further back into the past than would be indicated by bones and implements buried a few feet in surface soil. Some pieces of rude, sculpture, representing birds, beasts, and men, worked in a soft volcanic tufa, were found some years since, on Seavie's Island, buried in surface soil, interesting in themselves, as rude works of art---perhaps, intended as idols---but throwing no light on the question of human antiquity. Stone implements are found in abundance along the Columbia River, often several feet below the surface. Some of these are elaborately finished, intended for uses of which living Indians are entirely ignorant; but none of these stone implements, not even the rudest, have ever been found here, across that chasm that separates, as yet, in our geological record, the human period from that which is found next beyond, i. e. the period of the extinct elephant.

A deeply interesting portion of the geological record of Oregon occurs imbedded in those sands, clays, and washed gravel-beds that mark the position and outline of former lakes and streams, whose waters have long since drained off, to return as such no more, leaving the long record of the varied forms of life that once struggled upon their shores or sported in their waters.

In the winter of 1865 a freshet, caused by the sudden melting of snows and a warm rain-storm, occurred throughout Central Oregon. So violent were the floods that, in several places, within twenty miles of the Dalles, new ravines were opened through the country, laying bare beds of stratified clay, sands, and washed gravels, twenty to thirty feet below even the beds of the older ravines, extending, in some instances, to over a mile in length, and excavating to a width of a hundred feet or more.

That these excavations would lay open to the light fossil remains was to be expected. Search was made, and eight elephant tusks were found, of which five were so far decayed that, on exposure to the air, they crumbled to pieces; the remaining three have been preserved, and are now in good condition, though not entire. One of these, a part of a large tusk, is entire for about five feet of its length. It measures twenty four and a half inches in circumference at the larger end, and twenty two and a quarter inches at the smaller one, and belonged to the middle portion of the tusk. Another one, nearly all of which is preserved, though broken into four pieces, measures about seven feet in length, and is eighteen inches in circumference near the socket. In both these specimens the ivory structure is finely marked.

Other bones of the elephants were found in these excavations; among them a well preserved hip bone, the socket of which measures nineteen and a half inches round its rim. Several other bones, of less geological value, yet making in all a handsome collection, were thus obtained. Four well preserved teeth of the elephant were also found in these excavations. In the same beds were found other bones than those of the elephant. One of these is worth mentioning: part of the skull of an extinct member of the Bos family,

perhaps the *Bos latifrons*; for a line drawn across the bony forehead measures eighteen inches, which is a trifle more than the bony forehead of the largest of that species in the British Museum. A radius of that of an elk, entire when found, yet so fragile that it is now broken, was also discovered with other bones, making the opening of a chapter of Oregon's earliest history, unlooked for in this region, yet not unappreciated.

As yet, no trace of human bones or implements has been found in these excavations; a negative statement, it is true, that amounts to but little as an argument against the existence, during the elephant period, of human beings on these shores. And yet, for a negative argument, it amounts to more than would appear in its first statement; for the vicinity was certainly a pleasant one for human habitations. The waters that covered these bones with sand and gravel stood two or three hundred feet above the present level, of the Columbia River, and retained that level for a long time. A broad, beautiful lake extended westward and northward over the present city of The Dalles, and made the sheltered indentations among the low line of hills to the eastward a pleasant shore to inhabit. Into these indentations mountain streams washed the sediment that now covers the bones we find.

The objection to the force of these remarks, but that those ravines are too narrow to lay bare but a very small part of the record, finds in a knowledge of the locality itself an answer; for these were ravines of ravines, into which the whole surface drained, and toward which all things movable by flood or wind tended. A careful search for some trace of human life in these excavations resulted in no discovery that would associate man with these early inhabitants of the lake shores of the interior of Oregon.

Three years ago some men attempted to dig a well fifteen miles from the Snake branch of the Columbia. They reached a depth of sixty eight feet without finding water, and at this depth found, among washed gravel, a somewhat water-worn fragment of a bone. On examination, it proved to be the lower end of the radius of a horse. What a record comes to the light with this fragment of a bone. Sixty eight feet from the surface, in a country nearly level for thirty miles or more. Sixty eight feet of washed gravel, and kindred materials, showing a continued deposit of a body of fresh water that could result from no other cause than a lake extension of the Snake River, at a much higher level than its present one. Sixty eight feet of this filling in and extending for miles, thirty miles in one direction, and not less than this in others. This is surely an extended record of the past; and suspended, wonderfully, yet reliably, upon a small fragment of a bone; for bone it certainly is, and horse it as certainly was. Other localities than those named have contributed their share of facts in this wonderful record. A large tusk was found in Polk County, a fine specimen of part of the lower jaw with its two teeth broken; yet all these, and plainly elephantine, were dug from a mill race at Dayton.

Three teeth of the same kind were dug from a mill race on the Callapooya, near Albany; another, from Oak Creek, near the same place. Several fine teeth were dug from a mining claim in Canon City, one of which, a large one and well preserved, is now in safe hands. The materials for the history of the elephant period are abundant in Oregon, with an almost certainty of large increase in future excavations.

Other animals than those named will doubtless yet be found represented in those clays and sands and washed gravels with the remains of the extinct elephant; yet those already discovered make an interesting group. A few specimens of the woods of that period were also brought to light, among them some well-preserved pieces of birch wood and a few cones of the larch.

The connecting link between our modern human period and that of the extinct elephant as before stated, is not yet found in Oregon. In other countries this has been found for the teeth of the elephant and the implements of stone, that speak of human industry, have been found together in the same deposit; and therefore the elephant period was at once introduced in our sketch after the human period without questioning whether we had not thus dropped the promised thread of our record. The connection between the elephant period and that next beyond or older is not so plain; for that older record was closed in violence---in great outflow of volcanic floods and other kindred disturbing forces of the earth.

Animal remains in Oregon, older than those of the extinct elephant, are no longer found in clays, sands, and gravels, but in the argillaceous rocks, sandstones, and

conglomerates into which those were changed---bony remains still, and truly yet no longer bone, but rock. In these rocks we find opening to us, the more recent chapters in the records of Oregon's tertiary rocks---records full of interest and beauty. In the period of which these last tell us, the great interior of the country east of the Cascade Mountains was interspersed with vast bodies of fresh water filled with life and herb and tree, of insect and beast and bird; and the remains of these are preserved with marvelous truth and beauty, making the fragments of rock that contain them often gems of their kind---mute and blind yet truthful historians of an age long, long since passed away.

If the question be asked, why are the fossil remains of the elephant period in loose sands and clays, while the remains of the next period beyond are found in like beds, but changed into sandstones and argillaceous rock? and we look around carefully for an answer to this question, we shall find that the facts that now separate the one period from the other speak plainly of a time of the escape of great heat and heated vapors, loaded with mineral substances from the interior of the earth, and also of vast and frequent and continued volcanic overflows. How long that period of violence lasted, and how extensively it destroyed old things and built up new, are questions to be answered through future research.

That during that period of life was cut off from the earth, or even from this continent, is not to be believed; for, while it was a time of violent change and disturbance along the lines of our two principal ranges of mountains, a time of comparative quiet may have existed on the other slope of the continent, and life of plant and animal may have gone on in their accustomed round of growth and death. But here, in what is now Oregon, a broad and deep chasm in the history of life was brought upon the lands and upon the waters, separating the life record on this side, which we have designated as that of the extinct elephant period, from that which existed beyond.

We have thus briefly skimmed over the surface geology of Oregon, treating our subject under the two divisions of, first, the human period; and second, the period of the extinct elephant. Briefly as the subject is sketched, it covers the records of a length of time difficult to realize; and yet our inquiries have only reached the threshold of the subject.

THE GOLD FIELDS OF OREGON

The gold fields of Oregon cluster around its mountain ranges, and may accordingly be designated by the names of its principal chains of mountains, as that of the Coast range, the Cascade Range gold region, the Blue Mountains gold field; those of the three cross ranges of mountains, in Southwestern Oregon, known as the Siskiyou Mountains, the Umpqua Mountains, and the Calapooya Mountains, and those of the Snow and Puebla Mountains in Southeastern Oregon.

The gold of the Coast range has only been found in paying quantities in the sands of the sea beach, from which it is washed at low tide. These beach diggings extend for hundreds of miles, with gold enough yet left in them to pay moderate returns for ordinary labor; and with a record running back over a period of twelve or fifteen years, whose statements may be divided into the "reasonable," the "marvellous" and the "fabulous" and the numbers corresponding to each successive stage be stated at \$12 to \$15 per day to the hand, \$50 to \$100 and \$300 to \$1,000 per day---the last figures, doubtless, seldom found. The gold of the beach is found in heavy, black sand, apparently either brought down from the interior by the rivers of Southern Oregon, which come from a gold bearing region and distributed along the beach by the waves of the ocean, or else derived from broken up ledges of gold bearing rock near where it is found---the latter supposition seeming to find confirmation in the fact that the best diggings (not only, but the only ones that have paid at all) are either around those capes and sunken ledges of rock that mark the extension seaward of the cross ranges of mountains, the Siskiyou, the Umpqua, and the Calapooya, or else places where spurs of the Coast range itself come down to the sea. We find accordingly

around---first, the seaward extension of the Siskiyou Mountains, at Point St. George near Crescent City, extensive beach diggings; second, the extension, seaward, of the Umpqua Mountains, marked by a ledge of rocks running out four miles into the ocean, and only lost in the increasing depth, which is, too, surrounded by important beach diggings; third, from Cape Perpetua, several miles northward, marking the extension of the cross range of the Calapooya Mountains---extensive beach diggings, still worked with paying results. At or near one of these three points have been found the principal gold diggings of the beach, while in every instance not connected with these points in which gold had been found, the other class of facts were present, viz: the extension down to the sea of some spur of the Coast range.

The inquiry naturally arises: Did the storm surf disengage the gold from these sunken ledges of rocks, these heads of gold bearing mountains, here plunging into the sea? Or did the rivers bring it from the interior---the waves only distributing it along the beach in the direction in which prevailing winter storms would drive it---sunken ledges of rock extending across its path, arresting and holding it in their eddies?

Marvellous stories are told of the wealth taken in former years from some of these places. They are still worked in three or four places, with paying results. They extend from the California line to the Straits of Fuca, but the principal ones are those named.

Another gold field exists in Oregon, among the slopes of the Cascade range. The Willamette Valley, which separates the Coast Mountains from the Cascade Mountains, is part of a vast trough, extending, in its general features from Puget Sound to the Bay of San Francisco, which is, in its Oregon portion, so filled in by tertiary and post-tertiary deposits that its older rocks are, for the most part, buried far from sight. It is only in ascending the slopes of the Coast range, on its western margin, or in ascending the slopes of the Coast range, on its western margin, or those of the Cascades on its eastern, that older rocks appear. All the streams that fall from the western slopes of the Cascade range contain more or less of gold in their bars. The Clackamas, the Molalla, the Santiam, the Calapooya, and the forks of the Willamette, have all been found to contain gold; only that of the Santiam has been worked.

There is that in the gold of the Santiam which invests it with peculiar interest to the mineralogist. It often presents the most beautiful systems of lace work, in gold threads, and semi-crystal forms of great symmetry and beauty. A beautiful cabinet of these specimens may be seen in Salem, in the office of the company owning the Santiam mines. The Santiam mines are not now worked, though they once awakened a good deal of interest. It is a curious fact that little or no gold has been found in the streams of the eastern water-shed of the Cascade Mountains, opposite the Willamette Valley, while those of the western slope so uniformly show its presence. It looks a little as if the fractures of the range from which its floods of trap escaped were nearest the eastern edge, and buried its older rocks on that side to a great depth than on the other. The other volcanic materials, ash and pumice, would most naturally, aided by prevailing western winds, drift in the same direction. Another gold field exists in Oregon, among the ridges and slopes of the Blue Mountains.

In the region between the Cascade range and the outlying spurs of the Blue Mountains the older sedimentary rocks are, for the most part, covered by trap and tufa, the trap varying in thickness from hundreds of feet, as seen at any of the crossings of the Des Chutes, to a thin capping on the hills, sixty miles farther east; the tufa, as stratified sediment of ancient lake beds, extending east and southeast over vast areas---its material varying from fine volcanic ash to coarse masses of pumice and obsidian. Traveling eastward, the trap is found at its, apparently, greatest thickness in the trough of the Des Chutes, where one can count as many as thirty distinct overflows, varying in thickness from ten to twenty-five feet, and covering entirely from sight, even in the deepest canons, the older sedimentary rocks. Fifteen or twenty miles further east one gets a glimpse of the sedimentary rocks in the bed of Trout Creek, though yet covered by seventy five or eighty feet of trap; twenty miles still further east the trap has thinned out to only a capping on the hills, while the varied strata of the tertiaries are in full view on every side in the region of the Currant Creek and the John Day's River. The lowest members of this tertiary series of Currant Creek are richly stored with the most beautiful specimens of fossil botany in the country. This order of succession of the rocks, as we travel eastward, is the same whether we travel farther south along the valley of Crooked River, or that of the John Day's, which in its upper portion, also runs east and west, or in an intermediate line by Antelope Valley and the Canon City

road. But this series reaches the largest number of members along the line of the Crooked River Valley, for on reaching the forks of that stream, for the first time on our journey, we come to abundant and beautiful marine fossils.

Among these marine fossils there is one in so great abundance as to characterize the rock--a beautiful *Trigonia*, resembling *T. evansii*, of the California survey. Ammonites, *Truillites*, and other beautiful forms abound. I am the more particular to notice this outcrop of marine fossils, for there are found the first indications of gold in our approach at the Blue Mountains in this line of travel, and these indications increase from that place till we reach paying rock, at Canon City, Willow Creek, Mormon Basin, and a score of other mining camps of the Blue Mountain region. A few miles still further eastward, from this outcrop of *trigonia* rock, other and apparently older marine rocks come to the surface; among these a limestone, containing *Rhynchonella*, *Cyrtoceras*, and other marine shells, in the greatest perfection and abundance. The eastern slopes of the Blue Mountains have, too, their marine rocks; among these a dark blue limestone, with a small *Productus* in great abundance through it, is often met. These marine rocks lie against the outlying spurs of the Blue Mountains on the southwest, south and east, as an apparently ancient shore-line around an island, while the wide extent of lower country south, to the California line, is covered with volcanic materials, mostly as stratified tufas, in which masses of pumice and obsidian abound.

It was stated above that the same succession of rocks was encountered in travelling eastward along the line of the valley of the upper waters of the John Day's; one considerable exceptional mass of rock occurs in this line of travel, at about sixty or seventy miles east of the Des Chutes. It stands as a sort of island of slate-rock, without any appearance of fossil remains, surrounded on every side by more recent and plainly eocene tertiary rocks. The slates are traversed by veins of quartz, in which are traces of gold. Some work was done here a few years since in crushing rock, but without paying results. An abandoned arrastra may still be seen in a valley that opens into Curren Creek, near the Canon City road, built to crush this rock. Dikes of trap are near. The strata are all very much disturbed around this older slate, but it is only an isolated spot of gold rock, with no apparent connection with the mass of its kind further to the east. But while gold is thinly distributed here, fossil remains are beautiful and abundant. A broad belt of this tertiary extends from the valley of the Crooked River, north across the line of the John Day, and on toward the Columbia River, whose lowest member, in some localities, abounds in fossil bones plainly eocene, and in a portion of that same member at Bridge Creek, schistose rock occurs full of vegetable forms, some of whose leaves measure from twenty-five to thirty inches across, and these arborescent, too. This whole central region of Oregon, though now apparently poor in gold, is certainly rich in geology.

The country east of the Blue Mountains, comprising a part of Grant, and the whole of Baker and Union Counties, is described at some length in the succeeding pages.

THE SNOW MOUNTAINS AND PUEBLA MOUNTAINS

These mountains, extending into the southeastern corner of Oregon from Nevada, are, to some extent, gold-bearing; silver and copper ores are also found there, with what promise of future value remains yet to be ascertained. A vast lake depression separates these from the Blue Mountains, with no marked feature of interest to the mineralogist.

THE GOLD FIELDS OF SOUTHWESTERN OREGON

The Siskiyou, Umpqua, and Calapooia Mountains --three cross ranges running from the Cascade range to the ocean---are gold bearing, and their mines are still worked to some extent. During the years 1852, 1853, and 1854, these mines were very productive; they are still worked, but mainly by Chinese labor.

I shall proceed to notice in brief the principal mining counties of the State. For the foregoing general remarks upon its gold fields I have to thank Rev. T. Condon, of Dalles City, a geologist whose enthusiasm and perseverance have made him intimately

acquainted with many parts of his adopted State.

In the following description I pass over several counties in which gold and silver occur, because there has been so little attention paid to mining in those localities, or it was impossible for me to obtain enough trustworthy information to supply a separate account of each. The counties thus passed by are Douglas, Lane, Linn, Marion, and Clackamas, along the west side of the Cascade range, and between it and the Coast range. Gold has been found more or less in all these counties; but the superior attractions offered by agriculture in the fertile Umpqua Valley in the first named county, and the magnificent valley of the Willamette, unequalled in the world, which includes the rest, have drawn away, to some extent, the attention and energies of the inhabitants. Douglas County, which adjoins Jackson and Josephine on the north, is, however, not without productive mining ground like that which has made its southern neighbors celebrated. Coffee Creek, Low Creek, the Middle Fork of the Umpqua, and Myrtle Creek, all in this county, have yielded handsomely. New diggings were discovered during the past year on the latter stream, and were reported to yield \$10 to \$15 daily per man. Their area is probably limited. There are also some promising quartz veins in the Bohemian district, in Lane County, about fifty miles from Eugene City. The newspapers report silver as well as gold from this district. The Excelsior lode, owned by Messrs. Knott and Ladd, is to have machinery put on it. Other lodes, less developed, promise well. At the time of my passage through the country most of the miners, who are also farmers, were harvesting their grain in the valley.

The mines of Santiam district have been the scene of intense activity and excitement. A few specimens of quartz from this locality attracted much attention on account of their beauty and value. The wire gold of Santiam is celebrated among amateur collectors of minerals. But the mining operations were a total failure. Thousands of dollars were expended in opening a road to the head waters of the Santiam; building dwellings, a saw mill and a quartz mill, and developing claims. The locations, buildings, and other property are now utterly abandoned, and the district is deserted.

In Umatilla and other counties along the Columbia, there is some barmining; but these operations are scattered and fluctuating, and I have been unable to obtain precise information concerning them.

Oregon is destined to become the seat of a wide spread and productive mining industry in the precious metals. Her wealth in this respect has been explored to a comparatively small extent, but in so many different places as to indicate a vast area of territory, which will be available in the future. The remarkable facilities afforded by the State, by reason of her fertile soil and abundant coal, iron, and water power, for agriculture and manufactures, will secure to mining and beneficent support of these branches of activity, and the farmer and manufacturer, in return, will find a needed stimulus and reward in the presence of mining communities at their doors.

JACKSON COUNTY

I am indebted for much valuable information concerning this county to Mr. Silas J. Day, of Jacksonville, whose character and long acquaintance with the neighborhood give ground for confidence in the correctness of his statements, many of which are also confirmed by my personal observation.

The population of the county is about six thousand six hundred, six hundred of whom are Chinese, principally engaged in mining. The number of white miners, according to the books of the county assessor, is five hundred. The latter receive, when hired, from \$2.50 to \$3.00 coin per day. The wages of a Chinese laborer are \$1.25 to \$1.50 per day, or \$35 per month. The following is a brief account of the principal mining districts in the county:

Jacksonville district, including both forks of Jackson Creek and its tributaries, was organized in 1852. The mines hitherto worked have been placers, with some coarse gold.

Applegate Creek, ten miles in a southerly direction from Jacksonville, is a considerable stream, on which a saw mill has been erected. It is a tributary of Rogue River. The district of this name was organized in 1853. The mining operations on Applegate Creek have been quite extensive. The gold is found mainly on the "bars" of the creek, which for a distance of four miles were very rich. They are now

They are now principally worked by Chinese. Water is obtained from a large ditch brought from the creek four miles above the bars, and now owned by Kasper Kubli.

Sterlingville district, about eight miles due south from Jacksonville, was organized in 1854. This has been, and is still, a thriving mining camp. The gold in the placers is coarse. The supply of water, however, is limited, as there is no ditch in the district which taps any considerable stream.

Bunkum district, on the other hand, a southern extension of Sterlingville district has an abundant supply of water during most of the year, brought in three ditches from the North Fork of Applegate Creek.

Foot's Creek district was organized in 1853. The stream from which it takes its name is a tributary of Rogue River, situated about fifteen miles northwest from Jacksonville. The mines are coarse gold diggings.

Evans's Creek and Pleasant Creek districts are contiguous to each other, about ten miles north of Foot's Creek. The coarse gold diggings of these districts are worked principally by the hydraulic process, for which the necessary supply of water is furnished by the streams named in abundance during the rainy season. Both these districts were organized in 1856.

Forty nine diggings, eight miles southeast from Jacksonville; organized in 1858. The gold is inferior in quality, and worth only about \$12 per ounce. Water is supplied by a ditch from Anderson and Warner Creeks.

The mining laws of all these districts are copied from those of Yreka, in California. The tax on foreign miners (by which only the Chinese are understood) is \$16 annually per capita. There is also an annual poll tax of \$5 on all mulattoes, Chinamen, and negroes.

The first discovery of gold in Jackson County is said to have been made in the autumn of 1852 by James Cluggage, on Rich Gulch, a tributary of Jackson Creek. Both in the gulch and in the creek large nuggets were, in the earlier days of the mining industry of this neighborhood, frequently found. One piece of solid gold, worth \$900 was taken from the latter stream, and many were obtained ranging in value from \$10 to \$40, and up to \$100. These discoveries led to the development of a considerable mining industry, in which, however, no great amount of capital was invested. The claims in the county are, with the exception of the bars and a few quartz claims, mentioned below, generally placer and gravel diggings. The heavy wash gravel ranges from two to twelve and even twenty feet in thickness, and contains a large amount of stones, and even rocks of considerable size. This is especially the case on Jackson Creek. The bed rock is slate or granite-- the former predominating. Water is supplied principally by the rains of the wet season, which swell the local streams. There are few mining ditches in the county, and none of great magnitude, the length being generally from one to four miles, and in no case exceeding the latter figure. The mines are therefore directly dependent upon the duration of the season of rains. This lasts usually from December 15 to June 1. The mining season for the year ending June 30, 1869, was, however, here, as elsewhere, a very short one, owing to the extreme dryness of the winter. The season opened about the 10th of January, and was over by the middle of May. When I visited the county, early in August, nothing was doing except by some of the Chinese, who were painfully overhauling the dirt heaps and carrying the earth to water. The average annual product of Jackson County in gold dust for the last five years has been, according to good authority, \$210,000. I estimate the product for the year ending June 30, 1869, in spite of the brevity of the season, at \$200,000, since the patient labor of the Chinese, of whom there are a considerable number working for themselves has made up the deficiency of the season. They have produced not less than \$75,000 during the year referred to. The product for the calendar year 1869 is practically the same as I have given, since the period of active operations fell wholly within 1869.

Some very rich quartz ledges have been discovered in this county, and I do not doubt that this, like so many other placer mining regions, will eventually become the scene of extended deep mining operations. No quartz veins, however, so far as I could learn, have been worked in Jackson County with capital perseverance, and judgment adequate to fully prove their values, though in several instances large profits have been realized from operations near the surface.

One of these instances is presented by the celebrated Gold Hill vein, situated ten miles northwest of Jacksonville, and discovered in January 1859. The ore is white,

almost transparent quartz, and, in the pocket first exposed, was highly charged with free gold. Some rock taken from the ledge was so knit together with threads and masses of gold that when broken the pieces would not separate. The vein was worked rudely for a year, and the ore crushed principally in an arrastra. The sum of \$400,000 was thus extracted, besides a large amount of extremely valuable specimens, one of which was presented by Maury and Davis, merchants of Jacksonville, to the Washington Monument, and now, I am informed, occupies a place in that structure. But the pocket became exhausted; subsequent operations failed to find paying rock, and the work has been suspended for some years. The property is now owned by a few shareholders, who intend to resume mining at some future time.

The Fowler lode, at Steamboat City, twenty miles from Jacksonville, is also at present lying idle. This ledge was very rich near the surface, where the rock was considerably disintegrated. The contents of a rich chimney or pocket were extracted, and crushed in arrastras run with horse power. Major J. T. Glenn, one of the owners, says \$350,000 were taken out.

Arrastras were erected at a ledge on Thompson's Creek, a tributary of Applegate, to work the ore extracted, but the rock did not pay, and it was finally abandoned. The Shively ledge, on a tributary of Jackson Creek, has had a similar history.

At present there is but one quartz vein worked in the county. It is being developed by a few men as a prospecting scheme. They carry the quartz about a mile, to the Occidental mill, where they have already had about 100 tons treated, realizing about \$1,000 or \$10 per ton.

There are three quartz mills in the county, all driven by steam. The Jewett mill, on the south side of Rogue River, was erected six years ago in connection with a ledge of the same name. It had eight stamps, and 32 horsepower. The investment was not profitable, professedly because the gold was too fine to be saved, and the mill is now a steam saw mill.

A mill similar to the foregoing was put up seven years ago at the forks of Jackson Creek. It cost \$8,000 and was intended for custom work, but did not pay, and is now owned by Hopkins & Co. as a sawmill.

The Occidental mill, on the right fork of Jackson Creek, was built four years ago by a company at a cost of \$10,000. It has ten stamps, and 40 horse power, was made at the Miner's foundry, San Francisco, and a daily crushing capacity of 20 tons. The machinery includes two rotary pans.

The cost of mining materials in this county is not excessive. Lumber is worth at the mill from \$18 to \$22.50 per thousand feet, according to quality; quicksilver \$1 per pound; blasting powder, 33 cents per pound. Freight is generally shipped from San Francisco to Crescent City, California, and hauled from there in wagons to Jacksonville, at a total expense, including commissions, insurance, &c., of about 5 cents per pound. This enhances the cost of machinery and of some supplies. As a general rule, Jackson County receives no freight overland from Portland or Sacramento.

There are several good salt springs in the county. One at the headwaters of Evans Creek has been worked with profit for several years past by Messrs. Brown and Fuller. The salt is said to be white and pure, and commands a good price in the local market. Two beds of mineral coal have been discovered in the county. One on Evans Creek, about ten miles from the salt works, produces a superior coal, which is used by the blacksmiths of the county. It is comparatively free from shale, and is locally known as anthracite. The bed is owned by Mr. R. H. Dunlap, of Ashland. Large quantities of iron ore occur in many places throughout the county, on the surface of the ground. Some specimens from Big Bar, on Rogue River, was analyzed in San Francisco and found to be quite pure. Cinnabar is reported, but not in paying quantity, from Missouri Gulch a tributary of Jackson Creek.

JOSEPHINE COUNTY

This county is situated in the southwestern part of the State, and contains about two thousand five hundred square miles. It is bounded north by the Rogue River Mountains separating it from Douglas County, east by Jackson County, south by California, and west by Curry County. There are about fifteen hundred inhabitants, and five or six thousand acres of land under cultivation. Kerbyville, Leland, Slate Creek, and Waldo are the

principal towns. The condition of the placer mining in the county during the past year has been substantially the same as in Jackson County. Josephine suffers somewhat from lack of regular communications. It is perhaps on this account that I have failed to receive the detailed reports promised by letter from Sailor Diggings and other noted localities. The following description, furnished to a committee of the State Agricultural Society in 1869 by Dr. Watkins, a physician long resident in the county, may be relied upon.

Josephine County attracted attention as early as 1852, as a locality for placer gold mining. The first mining of any importance was on Josephine Creek, which derived its name from a daughter of one of the miners, and afterward gave name to the county. In the spring of 1853 there was a great rush to the mines on Althouse Creek, which rises in the Siskiyou range, and runs in a northerly direction, uniting with other tributaries, forming Illinois River. The diggings on Althouse were very rich, the bed of the stream paying not only heavily but quite uniformly. At one time Adams & Co.'s books had a thousand names to obtain letters for in the different localities, where miners had previously resided. Sailor Diggings was then a famous locality; a ditch was dug some fifteen miles long at a cost of some \$75,000 or \$80,000 to bring water to the rich placers of this vicinity, and when fairly under way paid for itself the first year. It paid heavy dividends to its stockholders for ten or twelve years, and many parties who live sumptuously every day owe their fortune to their connection with the Sailor Diggings Ditch Company.

Sucker Creek, a tributary of Illinois River, a large turbulent mountain stream, was extensively mined from 1854 to 1860 but the diggings are deep, the boulders are large and unwieldy, the stream an unmanageable one, and, I think, never made an adequate return for the labor expended; but Sucker Creek has not yet had its day, and, with cheaper labor and better facilities, it will yet yield a golden harvest to the hand of adventure.

Canon Creek, Illinois River, and Galice Creek, were mined during these years, and generally with an adequate return for labor expended.

Williams Creek, a tributary of Applegate Creek, has had for the last few years a hardy mining population, who have met with a moderate return. Josephine is a mining county, and has had all the vicissitudes of such a county. Her citizens leading a roving life, and having little to bind them to the soil, mostly left during the Indian war of 1855-56. Her rich minerals brought back to her a renewed population, however, but the great Fraser River excitement nearly depopulated her, and now she is only the shadow of her former self. But her rich placers are far from being exhausted. There are rich veins of copper running into her hills. The most noticeable one, some eight or ten feet in thickness, is situated in the hills between Waldo and Althouse; but for some reason attempts to work it have failed, although it appears to be of great purity and inexhaustible in quantity. But the copper mines down Illinois River will yet make this locality famous; the copper is found in well defined lodes, and practically inexhaustible. The question is one of transportation.

Platter & Beach have been running a tunnel for the last three years through a heavy divide, to turn the waters of Althouse, so as entirely to drain the bed of Althouse Creek. Hanson & Co. have done the same at another point, and are now "striking it rich." These two operations have opened a district of great mineral wealth, which will awaken the ~~Malachi quartz lode~~ old times in placer gold mining on Althouse. The returns of the Malachi quartz lode have been very heavy; and it is reported that this property has been purchased by a San Francisco house, who are pursuing the enterprise with vigor.

The county is dependent for supplies upon a slow, laborious and costly transportation over the Coast range.

COOS COUNTY

This county being situated west of the Coast range, and receiving much moisture from the Pacific Ocean, which bounds it on the west, is better adapted to graving than most of the country in the interior. The surface is hilly and broken, with extensive forests and not infrequently large and fertile prairies and valleys, covered

with heavy growths of nutritious wild grass. The timber is fir, spruce, alder, oak, soft maple, and cedar. The white cedar is the best finishing lumber found on this coast and is exported to California, the Sandwich Islands, and even China. All kinds of grain (except maize) and vegetables are adapted to this section. Coos Bay is the leading seaport in Southern Oregon. Empire City, about four miles from its mouth, is the county seat. There is a number of steam sawmills on the bay, doing a thriving business. The principal mineral wealth of the county thus far developed is found in its extensive coal fields, which have been worked more or less steadily for the last ten years. There are, however, rich gold deposits in the southern part of the county, and indications of silver, copper, and iron are reported. The Randolph claim is reported to have shown very rich discoveries, early in 1869, streaks of sand having been found paying forty to fifty dollars daily to the hand.

The Coos Bay coal deposit was examined during the year by Mr. William Ashburner, of San Francisco, to whom I am indebted for information on the subject. It is composed of three seams, inclosed in sandstone, dipping toward the southwest at an angle of about fifteen degrees in thickness of uniform quality, and separated by an intercalated stratum of sandstone four inches thick. The upper seam of coal, besides being of inferior quality, is only one foot thick, and is not removed by the miners but allowed to remain and support the roof, which is firm and easily sustained.

The coal produced from this mine is of the quality known as "brown coal" of recent geological formation, and therefore distinct from the principal coal measures of the eastern States. This has a fine black color, with brilliant conchoidal fracture, is free from iron pyrites or sulphur, not liable to spontaneous combustion, and burns without the disagreeable odor so frequently accompanying coals of this nature, leaving but little ash.

The very superior quality of this coal for domestic purposes has been sufficiently demonstrated by an experience of many years in San Francisco, where it is said to command a better price than any other coal of the coast; but how far it can be made available for industrial purposes and ocean navigation can only be determined by actual experiment on a large scale.

This deposit, taken as a whole, appears very extensive and covers a very considerable area. There is well authenticated information of coal being found at least eighteen miles south of Coos Bay, though at too great a distance from the coast to be made available. The fact is interesting and important, as going to prove the extent and continuity of the basin in this direction. Over nearly or quite the whole of this region, the country is heavily wooded, so that detailed researches are impossible upon the surface. The only means of defining the limits of this coal tract and obtaining a correct knowledge of its more important geological features would be to bore, a labor involving time and expense, and which, under the circumstances, is quite unnecessary, for the formation is very regular and apparently destitute of faults or dislocations and by the ravines and gulches which traverse the country have been made by erosion, and not by any deep seated action which would affect the regularity of the coal deposit. These features are extremely favorable and important for the future working of the mines, rendering the winning of the coal far more economical than if the seams were faulted and broken.

The distance from the wharf to the mouth of the Coos Bay Company's mine is one mile. The loaded cars descend to the water's edge over a railroad of easy grade by force of gravity, and are returned to the mine by mules.

Such is the purity of this coal that it requires no assorting, but is loaded directly on board ship as it issues from the mine, or else stored, awaiting the arrival of a vessel.

The cost of delivering one tone of this coal in San Francisco is not far from seven dollars, and is composed of the following items of expense:

Cutting and delivering the coal on the cars in the mine.....	\$1.00	14.3
Interior and exterior transportation.....	.15	2.1
Freight to San Francisco.....	4.50	64.3
Towage in Coos Bay and across the bar at the mouth of the harbor..	1.00	14.3
Sundries.....	.35	5.0
	<u>\$7.00</u>	<u>100.0</u>

By an inspection of the above statement it will be perceived that freight and towage amount to nearly eighty per cent of the total cost, and that none of the other expenses can be regarded as excessive, but are, on the contrary, very low as compared with other coal mines upon this coast. This is mainly owing to the remarkably favorable conditions in which this property is situated for economical working. The items of towage and freight to San Francisco will be probably lessened when a new tug now in possession of construction, shall have been completed. The cost of freight to San Francisco must always depend in a great measure upon the facilities afforded to entrance to and egress from the harbor, the rapidity with which vessels can be loaded, and the average length of the voyage, and the risk of detention. By reducing these to a minimum, a reduction can be probably effected upon the present cost of freight. Assuming the thickness of the workable seams to be four feet six inches---which they are fully---and the loss from wastage to be twenty five per cent, each acre would produce 5,000 tons of coal.

Congress has made a grant of land for a wagon road from tide water on Coos River to Roseburg, in Douglas County, and a company has begun the work. This will enable Coos Bay to command the tract of the Umpqua and Rogue River Valleys.

CURRY COUNTY

This is the most southwestern county of Oregon. It resembles in surface conformation soil, timber, and climate, the foregoing county, which is adjacent to it. There is less rain during the winter west of the Coast range than between the Coast range and the Cascade Mountains.

At the mouths of the Coquille and Rogue Rivers are harbors that have been used by small vessels, to some extent. At Port Orford there is good anchorage, and a roadstead well protected, except from the southwest. This is the principal shipping port, and steamers frequently stop on their way up and down the coast. Coal, copper, silver, and gold are found at different places. Gold mining has been found remunerative in many places, principally, however, along the coast just above the summer tide line, or where the sea has receded, in the sand. These mines are inexhaustible, as the high tides and seas of winter bring a fresh supply of sand mixed with dust, for the coming summer's work. The average returns from this kind of labor are, however, not believed to be very high. In my opinion this beach gold is derived by abrasion from quartz lodes, brought down to the sea by the streams, and rolled back by the tide upon the shore, just as the sands of Port Said, the Mediterranean terminus of the Suez Canal, are found to be the deposit of the Nile. The copper mines and quartz ledges of the coast will be worked to advantage at some future day. Recent developments of quartz ledges are said to be very flattering. Rich gulch diggings are reported to have been discovered during the past year on Sixes Creek, in this county, higher up the stream than operations had ever been carried on before.

Besides the rivers named, there are several smaller streams putting into the ocean, in all of which, in the spring and fall, large quantities of the finest salmon may be easily caught. They are a staple article of food at home, and are already becoming an article of export, and the business of exporting them will largely increase as the art of preservang them fresh in cans is better understood. Cod and other fish are also caught with hood and line at Port Orford, and there are banks near the mouth of Rogue River where codfish may be caught. Much of the timbered country is easily cleared during the long, dry summers, and thus the best of farms are made along the streams, even where there are no prairies. Bees have been imported, and do remarkably well, and the honey is better than that gathered on the large prairies in the interior.

There is a road from Crescent City, California, up the coast to the mouth of Umpqua River; also from Port Orford back into the Umpqua Valley. Another leads from tide-water on the Coquille River to Roseburg.

GRANT AND UNION COUNTIES

Grant County is rectangular in form, included between the parallels 42 and 45 of north latitude, and the meridians 41 and 43 of west longitude. It is bounded, north by Umatilla County, east by Union and Baker Counties, south by the State of Nevada, and west by Wasco and Jackson Counties. Its area is not far from 14,000,000 acres. In the eastern and northeastern portions the country is broken by the Blue Mountains and their spurs; in the central and western parts, drained by the three forks of the John Day's River and their tributaries, numerous small valleys of great fertility are found, and the hills and table-lands, covered with bunch grass, afford a vast area of pasturage for stock raising. Extensive grass prairies stretch southward to the boundary of Nevada, and are traversed by a chain of small lakes, connected by fresh water streams, and supposed to be a great part of a great internal, isolated lake system, which includes the Great Kalamath Lake Valley, in the eastern portion of Jackson County, Sprague's River Valley, and the Humboldt basin in Nevada. The lakes of this chain in Grant County are Grass, Antelope, Christmas, Trout, Malheur, Harney, North, and Middle Lakes. The connection between these and other interior lakes is not fully established, and I think it doubtful. It seems to be quite as likely that the continuous basin or basins once existing have been separated into much smaller systems, each having its own independent water supply, and maintaining itself by a fluctuating equilibrium between the rain or snow fall of the wet season, and the evaporation of the rest of the year. They abound in fish, especially bass and mountain trout, and afford to mining prospectors a much easier and cheaper method of obtaining provisions than the pack saddle or the rifle. The country is accessible from the Columbia River by means of a good road from the Dalles to Canon City, and the regular mail route from Umatilla to Boise, which passes through Umatilla and Baker Counties, along the borders of Grant. South of Canon City a good military road leads to Boise. For the convenience of the settlers, and the more rapid development of this country, it would be well to send the through overland mail from Boise on alternate days, or weekly, by way of the Canon City road, instead of keeping a daily mail on the Umatilla line. The government patronage would help to support two lines of communication, and the cost to the public would be no greater. The two routes are of equal length, and the same time could be made on both. As far as the pleasure of travel is concerned the road through Grant County is less dusty, and the scenery incomparably finer. There are no more picturesque views on the Continent than the panoramic display of the Cascade range seen from the heights above the des Chutes, or the deep basaltic gorge of the latter river, or the wild, grotesque canons of the John Day, or the thickly wooded ranges of the Blue Mountains traversed by this road. At present there is an excellent stage and express line from the Dalles to Canon City, but no regular communication beyond. I made my way from the latter place by bridle paths across the Blue Mountains into the Powder River and Burnt River Valleys, visiting on the way a considerable number of mining camps, and satisfying myself, by personal observation, of the immense extent of territory in this obscurely known region, which will, hereafter, furnish a basis for extensive gulch and placer mining.

Our great continental interior may be roughly divided into the buffalo grass country, the sage brush country, and the bunch grass country. To the third of these divisions belongs the eastern part of Oregon, between the Cascade and Blue ranges. The sage begins to predominate as the Nevada line is approached. Neither of these two, so far as I know, are found to any extent east of the Rocky Mountains, and the buffalo grass does not grow west of that chain. This explains the fact, of which I am assured by hunters and others, that no buffalo or buffalo bones have ever been found beyond these mountains. But I return from this digression to a description of the mining fields of Grant County. In this connection I would gratefully acknowledge the courteous assistance furnished by many citizens, and especially by Messrs W. V. Rinehart and John L. Miller of Canon City.

Grant County is one of the principal seats of placer mining in the State and although it has of late, and especially during the past year, declined in importance, it will doubtless recover from this temporary depression. The principal mining districts are:

Dixie Creek, eighteen miles east of Canyon City, the county seat, organized in the summer of 1862. Its present population is 100 whites and 200 Chinese. The stream is worked for about five miles by sluice washing and yields fine sclae gold, containing more than the usual proportion of silver. The fineness is about .860.

Elk district is situated thirty miles north of Canon City. on the creek of the same name, a tributary of the John Day River. Gold was discovered in this district in April 1864, by a party in pursuit of Indian horse thieves. During that summer it was prospected with favorable results by Mr. John L. Miller, of Canon City, and others, and operations have been continued during successive seasons ever since. The bed-rock is said to be slate. The mode of working has been for the most part by drifting under the surface, in the auriferous stratum, and raising the dirt by windlass, water wheel, or horse whim. A few claims, however, are worked in the early part of the season, when the snow is melting, by stripping off the surface, fluming, and ground sluicing. The largest nugget found on Elk Creek was worth \$480. Deep Creek, in the same district, has produced one of 37 ounces, worth \$629. A ditch, commenced in 1865 or 1866 by the Pioneer Company, and completed December, 1868, by other owners, brings water to the claims of its proprietors on Deep Creek, where hydraulic mining is conducted. It is eleven miles long, four miles being two feet wide at the bottom, and three on the top, and seven miles four feet on the bottom and about five on the top, with a depth, on the lower side, of sixteen inches. A large reservoir, on Deep Creek, was completed in 1869. The ditch cost \$17,600 gold, and the reservoir about \$1,500. Water failed very early this year, the run lasting only from May to July, and the product from the hydraulic claims is said to have been only \$1,800.

The Middle Fork of the John Day at or just below the mouth of Elk Creek, has been worked since July, 1865, and produced in the aggregate about \$42,000. The gold is fine flo gold, and has, like that of Elk Creek, about the same fineness as that of Dixie.

Elk district contains also numerous quartz lodes, but little work has been done on them beyond what is necessary to hold the locations, under the Oregon statute. The Gem of the Mountain, owned by Hugh McQuaid, claim 400 feet, deepest shaft 56 feet, has a vein averaging $4\frac{1}{2}$ feet, coursing northeast and southwest, dipping east, with a foot-wall of talcose slate. The quartz yields per ton, in arrastra, \$26; by mill process, (No 6 screens, copper plates) \$14.26 gold, .691. The National has an original claim of 1,500 feet, shaft 27 feet, showing a vein of 22 inches average width. The quartz yielded by mill process, (No 7 screens) \$20 per ton; but prospects indicate that it should yield \$50, especially along the footwall. The miners assert that the company is trying to freeze out some of its members, as, in spite of these favorable indications, the shaft is caved in and filled up, and no work has been done since December, 1865. The quartz mill is located on the left bank of the Middle John Day, opposite the mouth of Elk Creek. It contains two 4 stamp batteries; stamps, 500 pounds; drop, 8 to 12 inches; crushing capacity, 8 to 10 tons quartz per twenty four hours; driven by steam, 25 horse power; machinery bought at Portland; castings poor. A Knox pan, for amalgamation, is to be attached, to supplement the copper plates. The quartz is hauled from two to five miles to the mill.

A second ditch is in process of construction, about eight and quarter miles long, two feet wide at the bottom, and three at top, by fifteen inches deep on lower side. It will bring water to the Elk Creek diggings, and is now about completed.

The population of the district, July 1, 1869 was 60 whites and 65 Chinamen. The product of gold for the season of the 1869 will not exceed, according to my estimates, \$16,000. Mr. John H. Blake, merchant, of Susanville, has purchased from August, 1865 to August 1869, \$80,000 of gold dust from this district. Wages have been in different years as follows: In 1865, 1866, and 1867, the ground sluicing and working on the river claims \$5 per day to the hand; for drifting, \$6 per day of eight hours; windlass men, \$5 Board \$9 to \$10 per week. In 1868 and 1869 the average wages were only \$4 per day.

Olive Creek district, organized in the spring of 1863, is in the Blue Mountains, about 60 miles north by east from Canon City, and near the sources of the North John Day, Burnt, and Powder Rivers, the first of which flows northeast to the Columbia; the two latter southeast to Snake River. The quality of the gold obtained here is variable, being coarse and fine, pure and impure, within a few miles on the same stream. Some of it is not worth \$14 per ounce, while other dust, from localities within two miles, will be worth \$16. At the very source of the stream, in a gulch near the summit of the mountains, the gold is ragged, as if quartz had been disintegrated from it, leaving it prous and spangled. This is poor in quality, the finest being found three miles below. The population of this district is 80 whites and 50 Chinese. The snow falls in winter 8 to 12 feet deep, and prevents active work. The season for mining is from May to August, while the snow is melting. Supplies for this camp, as also for Elk and Granite, are chiefly brought from Umatilla, on the Columbia.

Granite Creek district is twelve miles north of Olive, and the gold is similar in character. This district was organized in the autumn of 1862. The present population is 40 whites and 200 Chinamen.

Burnt River district lies a little east of and between Olive and Granite. It was first worked in 1867. The present population is 80 whites, no Chinamen. The absence of the latter is proof that the mines are paying well. The whites seldom permit them to come into a new and rich district; and the working of placers by Chinamen may be taken as evidence that the deposits do not pay good wages to white labor. With its smaller population, Burnt River has yielded as much gold as any district in Grant County, except Canon itself. The process employed is chiefly hydraulic mining.

Canon Creek district is doubtless the most important in the county. It surrounds Canon City, the county seat, which has been a thriving town, and may yet recover its former prosperity. It is situated on the creek of the same name, several miles from its junction with the John Day. At the time of my visit the dry season had permanently stopped nearly all the operations on the creek; but the vast extent of the placer and hydraulic mining in the bed and along the banks of the stream was evident enough in the numerous ditches, hydraulic pipes, sluices, wheels, and immense heaps of earth and gravel extending along the creek for miles. Five years ago the shipments from this place averaged \$22,000 per month for the remainder of the year. The express charges on bullion to Portland are three and one half per cent, which leads many merchants to patronize the United States mails. For this purpose the dust is put up in flat tin cases, to fit regulation packages envelope and sealed with solder. The full weight allowed by law is sent in a single package, and others are added until, if necessary, thousands of dollars are thus mailed at one shipment. Not infrequently two hundred and fifty ounces go in a single mail. Nearly all the gold of Grant County goes down the Columbia to Portland, and thence by sea to San Francisco. The shipments are mainly made up the merchants, to whom the miners pay or sell the dust. This explains the fact that shipments continue even in the winter, when no gold is actually produced. All the districts except Canon and Dixie trade with Umatilla or Susanville; and hence the figures above given cover the product of these two districts. This would give about \$300,000 as the present annual yield; but on the one hand, no account is taken of the sums carried away by private hands; and on the other hand, I do not think the very disastrous season of 1869 will equal this average estimate. The placer yield of all these districts has fallen off steadily for the last five years. It will revive again, partly by the return of old settlers, who have been prospecting elsewhere without finding anything better than they left behind; partly by the introduction of additional water facilities; partly by the use of Chinese labor and the establishment of more reasonable rates for white labor; and partly by the development of a stable quartz mining industry, the necessary basis for which is abundantly afforded.

The cheapness of agricultural products arises from the fact that the troops and posts maintained by the government in this region during the Indian war stimulated a considerable farming industry, especially along the magnificiently productive bottom lands of the John Day. The high prices paid for hay, oats, and other supplies, made this business

very profitable; but the peace, and the consequent withdrawal of the troops, has caused a collapse. The farmers of the John Day Valley cannot afford to ship their products to more populous regions, nor can they find an adequate market at home. Agriculture will therefore temporarily languish, until mining revives---an event which will be hastened, no doubt, by the present low prices.

The great variation in the quality of the placer gold of this country is, I think, a special indication of its various origin. In other words, it should encourage the belief that numerous different quartz veins, cut by the deep ravines of the John Day and its tributaries have furnished the gold now found in and along the streams. This belief is confirmed by discoveries already made; and it is strikingly illustrated in the works of the Prairie Diggings Mining Co. about five miles east of Canon City.

The Prairie Diggings claims, as the name indicates, were originally gulch or placer mines upon the elevated rolling surface of one of the foothills east of Canon Creek. The gulch is almost dry in summer. The circumstance that no gold occurred in it above a certain place, below which the diggings were rich, led to the discovery at that place of a large body of auriferous quartz crossing the gulch. This locality illustrates, in a striking manner, the formation of placer deposits from quartz lodes. The country rock is dark slate, turning red on exposure. A belt of quartz and slate apparently 400 feet wide, coursing northeast and southwest, and dipping sixty degrees southeast, has been exposed by the erosion of the gulch. The channels of quartz are separated by slate, and have received different names as separate veins. Of these the Waterloo and I. X. L. are the most prominent. The width of 400 feet, above mentioned, is possibly illusory. In any case, it only refers to the distance between the extreme veins or channels of quartz on either edge of the group; and quite probably this appearance of width has been produced by a slide from the upper veins of a considerable section. If this were the case, the same series of rocks would be twice represented in the gulch, but the upper veins would be the true ones and would be found to continue in course to the northeast and southwest. This is indeed the fact. The Waterloo and IXL are traced by outcrop on either side the gulch, and the masses below seem to be but a repetition of these. The exact width of the belt is therefore matter of doubt. A shaft 30 feet deep on the Waterloo shows a vein of 11 feet inclosed in slate, and a pit of 10 feet on the IXL exposes a vein of 6 feet, also in slate. But the outcrops of these other veins distributed through the gulch, afford an enormous quantity of decomposed auriferous material, which has only to be dug up and wheeled into the mill. This was built in 1868, at the Vulcan Works, San Francisco, and is calculated for ten stamps, 640 pounds, drop 11 inches, 70 times per minute. Discharge, No 2 Russia. Power, waterwheel 40 feet in diameter, 4 feet breast, supplied by a ditch from the hills above. The average capacity of such a battery, running at the speed on ordinary quartz, should be about 7.8 tons daily. This $\frac{1}{2}$ mill crushes ten tons in twenty four hours, and is even claimed to have reduced 200 tons in a run of 12 days. The excess over the general average is to be ascribed to the peculiarly friable nature of the material. The average yield of considerable quantities milled, I believe to have been about \$8.50 per ton. With the present almost nominal cost of extraction, and transportation only a few yards to the mill, the water power, and simple amalgamation, (battery amalgamation 20 foot blanket sluices, 20 foot copper plated sluices, Knox pan for blanket washings) and the fineness of the gold obtained, (nearly .900 it is said) this property ought to pay handsomely, if the ore yields over \$3 per ton. Actual figures of working results are withheld on account of a pending litigation. This is itself an indication of a profitable enterprise. People do not generally go to law over worthless claims. It is when an enterprise, outliving the perils of speculation, mistaken or dishonest management and ignorance of the methods necessary to its prosecution, begins to show signs of certain prosperity, that the last and greatest enemy assails it.

The veins of Prairie Diggings strike directly toward the upper part of Canon Creek, and very likely belong to a system which, from its position, must be traversed by the numerous rich gulches and canons entering the John Day. In this belt of country, therefore, I look for further discoveries of important and valuable quartz lodes.

UNION COUNTY

This county is bounded north by the Walla Walla Valley, in Washington Territory, on the forty sixth parallel of north latitude; east by Snake River, which separates it from Idaho; south by Baker County, and west by Umatilla County. Between the Blue Mountains on the west, and the ranges of Eagle Creek and Powder River on the east, is the large agricultural and grazing valley of the Grande Ronde. The abundant water, timber, and fertile soil of the county are causing its ~~abundant water~~ rapid settlement by immigrants. The principal towns are La Grande, the county seat, on the Umatilla and Boise mail road, Union, fifteen miles southeast on the opposite side of the valley, Forest Cove, Summersville, and Orodell. The principal mining districts are in the Eagle Creek Mountains, striking the eastern edge of Powder River Valley, and on Eagle Creek, a tributary of the Snake. These mountains abound in gold silver and copper, but have been only half explored. The principal district is called Cooster. It is twenty miles square, on Pine and Eagle Creeks, and employs at present about two hundred and fifty men. The amount of good placer ground would support two or three thousand but for the scarcity and dearness of water. Bronk & Petre, the proprietors of a ditch eleven miles long, bringing water from Eagle Creek to the claims, charge twenty five to fifty cents per inch. More than a dozen quartz ledges have been more or less prospected. The Knight ledge, on which Carter and Co and Bronk & Co own claims, varies in width from six inches to four feet. The former firm has a small 5 stamp mill in operation. The Gem lode is occupied by two companies, the La Grande and the Humboldt. The ore contains more sulphurets than pure gold, and the companies are both in debt and idle. The La Grand company has a 10 stamp mill, the the Humboldt company a 10 stamp mill and arrastra. Neither the mining nor the metallurgical operations appear to have been intelligently and skillfully carried on. The only apparatus for saving gold in the mills was copper plates, which of course, were ineffective in the treatment of the sulphurets.

Concerning the lake district, which lies in Ewart, Jackson, and Wasco Counties, Oregon, and Siskiyou County, California, Mr. J. Wassen writes in the Overland Monthly for February 1869, as follows:

Coming from the northeast the Blue range from Oregon, the Cascade range from the north, and the Sierra from the south, blend into or form a vast steppe or tableland of lava and sage fields, interspersed a score of lakes in size varying from five to forty miles in length and proportionate width. This high separating belt of land and water commences at the Owyhee River, and extends westward to the mountains, running at right angles with the ocean---a length of three hundred miles, and an average breadth of one hundred and fifty. There are three distinct chains of lakes in this district. The eastern, known as the Warner, inclusive of the Harney and Malheur. The second chain of lakes may be called the Goose Lake, including its northern links---Alber, Silver, and other smaller lakes. Goose Lake nestles in the extreme north end of the Sierra and is the source of Pit River, the main branch of the Scaramento. This fact has been disputed, owing perhaps to the outlet being underground in the dryer seasons. The third and last and larger of the several chains is the Klamath, embracing Wright and Whett Lakes further south. The Wrner lakes string along more like a river, and the rapid current, the setting north at all times, is suggestive that this line of water is really the outcropping of a long subterranean stream. The amount of water is apparently more than the natural drain of the country adjacent, and the outline of a great river channel is distinctly traceable to the lakes of Harney and Malheur. The latter, however, are strongly tinged with the alkaline soil surrounding. The variety and great quantity of fish for which the streams feeding these lakes are noted; the myriads of water fowl of every conceivable species that make these lakes their summer resort, and the countelss numbers of deer, antelope, and larger game, contribute principally to make the district of the lakes what it surely is, the happy hunting grounds of the expiring race. They are hardly to blame for the tenacity displayed in its defense. This broad pass in the mountains from east to west, furnishing the wily savage witha hundred avenues of escape, to the right or left, with his plunder and his life. The shelving shores of the lakes furnished him warm winter shelter, and the great depressions, natural trails free from snow in the severest seasons. These trails are careully flanked at favofable intervals with little bastions

and semi-circular breastworks of loose stones, mementoes of Indian skill and strategy. Aside from any known or prospective material resource, the district of the lakes, with its dense forests and wierd deserts, picturesque mountains, and delightful valleys, and silent waters inclosed by perpendicular walls of mysterious formation, must ever be a scene of enjoyment for the tourist and lover of all that is grand, beautiful, and peculiar in nature.

BAKER COUNTY

This is the extreme southeastern county of the State. It is bounded north by Union County, east by Idaho, south by Nevada, and west by Grant County, and contains about 5,000,000 acres. The northern half of the east boundary is the Snake River; the North Fork of Powder River and the main river, constitute the north boundary; and the Owyhee runs for one hundred miles through the southeastern part of the county, entering at the southeast corner, and emptying into the Snake a few miles south of the old Fort Boise. The southwest part of Baker County is traversed by Crooked River, which, with its tributaries waters numerous small valleys. This region, and the region of the lakes, was until recently so infested with hostile Indians that explorations were very difficult. It has been crossed in every direction, however, by prospecting parties, and is one of the sections in which we may look for future discoveries of importance. Malheur River crosses the center of the county from outlying ranges of the Blue Mts. in Grant County, on the west, to the Snake River, on the east. Its numerous cascades furnish abundant water power, and it has extensive and fertile bottomlands. Agriculture in Baker and Grant Counties requires only accessible markets to make it thrive. Nature has done all that could be demanded in the way of soil, climate, and facilities for natural roads. Burnt River and Powder River, with tributary streams in the northern half of the county, have been the scene of active and extensive placer mining, though the resources of the region, in this respect, are even yet scarcely known. The amount of land improved in the county is about 5,000 acres, or one thousandth part of its area. The population is estimated at 3,700 and the property valuation is \$396,326. The stage road from Umatilla to Boise and Salt Lake, the military road from the Dalles to Salt Lake, and the old emigrant road, with other practicable routes, cross this county. The principal towns are Auburn, the county seat, (unless Baker City has quite recently received that distinction) Baker City, Express Ranch, Farewell Bend, Eldorado, Malheur City, and Amelia City.

The following are the names of the various mining districts in this county, as taken from the books of the county clerk:

Blue Canon or Auburn, ten miles southwest from Baker City.
Sparta or Eldorado, thirty miles south from Baker City.
Pioneer or Clark's Creek, twenty-six miles south from Baker City.
Humboldt or Mormon Basin, thirty five miles south from Baker City.
Easton or Amelia City, forty miles south from Baker City.
Willow Creek, forty miles from Baker City.
Webfoot Basin, between Powder River and Burnt River, twenty miles SW of Baker City
Rye Valley, 8 miles from Mormon Basin, 33 miles southwest from Baker City
Bull's Run, on Burnt River, forty miles from Baker City.
Oro Grande, on Burnt River.
Fort Sumter, near Powder River, 20 miles west from Auburn.
Rock Creek, on west edge of the valley, 12 miles from Baker City
Pochahontas, on west edge of the valley, eight miles from Baker City
Union, on the west edge of the Valley, eight miles from Baker City.

The older districts discovered as early as 1862, and worked with more or less steadiness ever since, are Blue Canon, Pioneer, Humboldt Basin, and Rye Valley. They are all good yet, containing large areas of placer diggings that will pay from \$3 to \$16 or \$20 per day to the hand. The Auburn camp, in Blue Canon district, has been more nearly exhausted, perhaps, than any other important one in the county; yet even at Auburn there is ground enough yet unworked to furnish profitable employment to large numbers of miners for several years to come. The great difficulty is the inadequate

supply of water. This camp is situated on a tributary of Powder River, and connected by a very fine road with Baker City, in the main valley, at present the most important and thriving town in the county. The gulch at Auburn does not supply water enough for mining, and the principal source is the ditch of the Auburn Canal Company, thirty miles long, completed in 1863, and costing, with reservoirs, etc. more than \$200,000. There are now at work in this district about 100 whites and 150 Chinese.

Shasta district contains two flourishing towns, Eldorado and Malheur City. Messrs Carter and Packwood have 200 Chinamen at work, building a ditch forty miles long, by means of which they expect to furnish a large supply of water for the season of 1870. Reeves and Co. have also a large supply of water for the season of 1870. Reeves & Co have a small ditch. The little work hitherto done in the district indicates that, with sufficient water, 2,000 men could find claims that would yield handsomely.

Easton district has one town, Amelia City. The prospects in this camp are good; the gold is very fine, worth \$17.50 per ounce.

Fort Sumter district contains a large number of placer claims, and some promising quartz lodes, which the owners are too poor to develop at present.

Bull's Run, Oro Grande, and Webfoot Basin are new districts, which promise well. Pioneer, Humboldt Basin, and Rye Valley, are, as already remarked, among the oldest districts in the county, and still remain among the best. They contain large areas of good placer ground. During the summer of 1866 a nugget of 40 ounces, worth \$640, was found in Humboldt Basin. The gold from these camps varies in value from \$14 to \$18.50 per ounce. Mining is carried on with iron and canvas hydraulic pipes, or with ground sluices. Rocking pays well in Humboldt Basin, where men have realized as much as \$70 to \$90 per day of eight hours, by this rude method. There is no ground unlocated in this camp; but in all the others there are many good chances yet open. Quartz ledges are discovered every season; but, as a rule, placer mining continues to pay too well to allow much attention to be turned to this more permanent, but more difficult branch. A Pocket vein, the Niagra, in Humboldt Basin, furnished in 1863 some remarkable specimens of quartz, studded with gold.

Rye Valley district has been successfully worked for four years past, but the gold is of low standard---about .740. The amount of silver mixed with it led to the belief that silver bearing veins might be found in the district. Since my return from Oregon, I have received information of the discovery of five or six ledges of silver ore, reported to be of extraordinary richness. Some of the croppings, smelted out upon a blacksmith's forge, yielded at the rate of \$7,000 to \$9,000 per ton. One of the lodes, the Green Discovery, is 18 inches to 2 feet wide at the outcrop. These claims have been eagerly taken up, and owners are very sanguine over the expected results of next year's operations. The snow prevents active working in the winter.

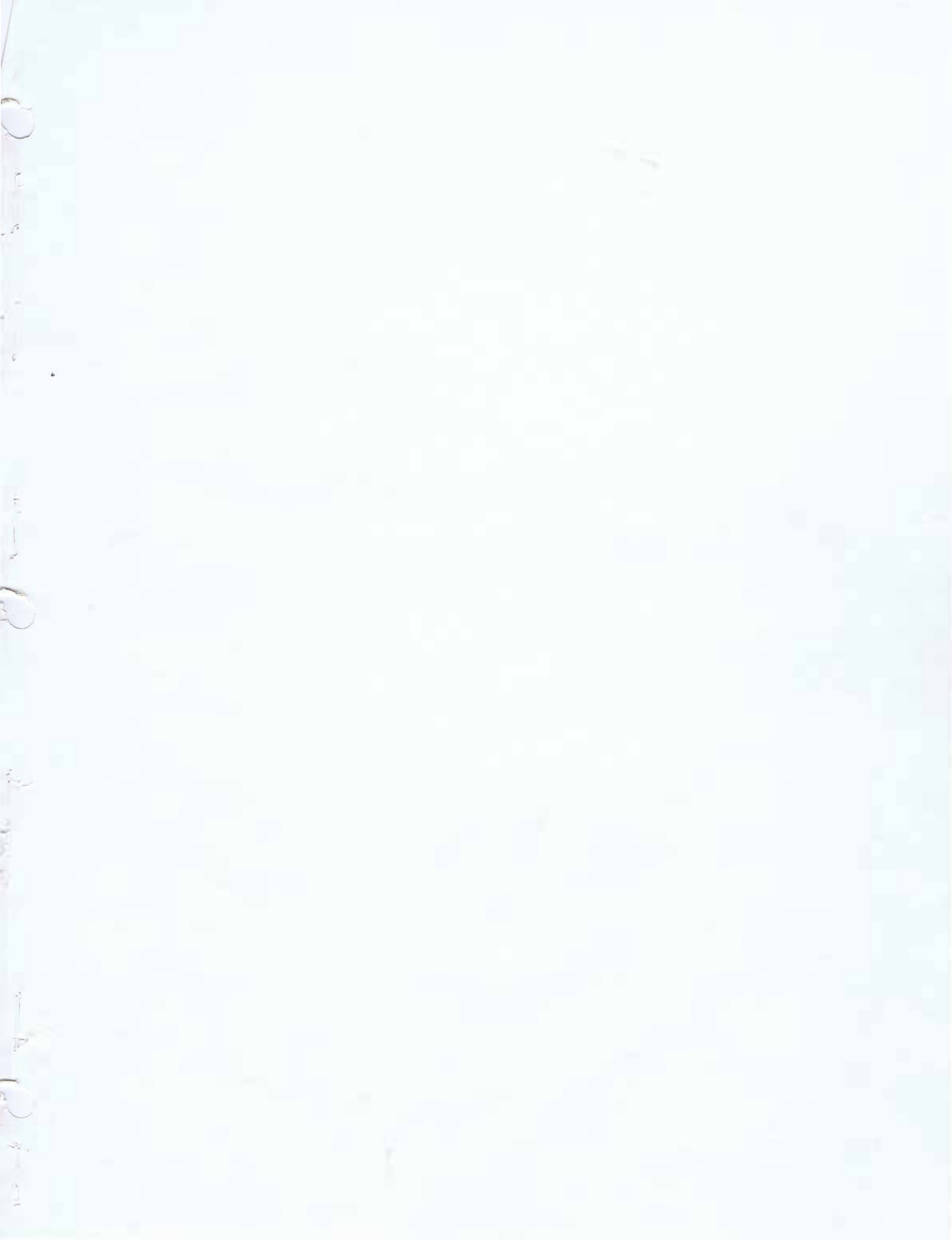
There are hill, gulch, and placer mines all the way up Burnt River from Express Ranch. Course gold, worth \$18 per ounce, is found on the steep, high points from 20 to 50 feet above the river, and the whole county is full of quartz lodes, which have furnished the gold of the alluvial deposits, but which are as yet, except in a very few localities, unknown and unheeded.

In August, 1869, a rich placer field was discovered (reported to yield \$2 per shovelful of dirt) on a small stream entering Snake River a few miles below the mouth of Burnt River, fifty miles southeast of Baker City. During the excessively dry season, 30 or 40 men have made wages on the bars of the Snake itself, where there is ordinarily too much water to permit bar mining.

Union district contains nothing of importance except the somewhat celebrated gold mine of Colonel Ruckel. This is situated eight miles east of Baker City, on the eastern slope of a range of hills, overlooking a large interior basin, across which

for many miles may be seen the gleaming, white, dusty line of the old emigrant road. The hills are usually covered with bunch grass; but this, at the time of my visit, had been devastated by creeping fires, giving to the whole landscape an inexpressibly desolate appearance. The little gulch which crosses the vein or veins of this mine, and debouches into the plain below, is possessed, however, of a good spring, and presents, even in a dry season, some touches of greenness. I believe the quartz lodes were discovered by teamsters, tracing up the float quartz found in the gulch, which was successfully worked as a placer for some years. There are a few other locations, but nothing developed.

The workings are on two veins, or two parts of the same vein, called respectively the Union and the Rocky Fellow, the principal mine, shown in the diagram, being on the Rocky Fellow. The course of the latter, which appears to be the main lode, is northwest and southeast, along the east face of the mountain, and its dip generally northeast, but varying from 45° to 80° . The Union workings on the northwest show that vein to course some 20° nearer east and west; and this course would inevitably bring the two together. I think the vein exposed in the principal mine includes both branches united into one vein. The workings have not been connected so as to show the point of junction. This vein varies in width from six inches to twelve feet, averaging three feet. The outcrop is perhaps 600 feet or more above the great valley, and a little more than 300 feet above the point in the foothills, where the company's house is situated, near the spring. The ore is quartz, carrying free gold, with a very small proportion of sulphurets of iron and copper. Much of the quartz has a milky appearance, and shows green spots and stains (not copper) like that of the mother lode in Mariposa, California. The best quartz is banded, and full of dark spots and seams. It is said to be pretty hard to crush, but to have yielded for months more than \$20 per ton. The position of the mine facilitates opening by cross tunnels, two of which have been run; the first or upper opening 292 feet vertically above the house, cutting the lode at 105 feet from its mouth, and the lower one, 122 feet above the house cutting the lode at 242 feet, and 190 feet vertically below the outcrop. The ground laid open by these tunnels and the drifts shown in the diagram has been nearly exhausted. To the southeast the vein grows harder and poorer, and I believe there is little encouragement to extend the drifts in that direction. To the northwest it apparently divides, and possibly the Union takes the best part of it. The timbering throughout the works is good, and the tunnels and shafts give excellent ventilation and perfect drainage. The new workings below the tunnel level are not much troubled with water, as there seems to be for the small quantity of water in the hills a subterranean outlet to the spring at the base. On the Union vein a shaft has been sunk 90 feet, and much quartz extracted from drifts and stopes said to have yielded in the gross aggregate \$30,000. No machinery has been required in the main workings hitherto, except the cars which transport on to the mouth of the long tunnel, where it is dumped into wagons and hauled to the 12 stamp mill at Baker City. Under these favorable conditions, the cost of extraction being only \$4 per ton, and the cost of hauling \$4, the mine has yielded large profits; but outside operations are said to have embarrassed the proprietor, and the property is now, I am told, involved in litigation. Only a few men were at the spot when I visited it, and the mill was standing idle. This mine has every appearance of extraordinary value; but it has been pushed hard for immediate revenues, and the result is, that new ground must be opened before the former flourishing production can be renewed. Its well defined persistent, and productive character, and that fact that it is the only development of the kind, to my knowledge, in a county which, I am convinced, will hereafter take a high rank in quartz mining, led me to give it a careful examination. I trust it will soon be worked again with vigor and success.



STATISTICS
of
MINES AND MINING

IN THE STATES AND TERRITORIES

WEST OF THE ROCKY MOUNTAINS

By ROSSITER W. RAYMOND

United States Commissioner of Mining Statistics

WASHINGTON
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CHAPTER III

OREGON

The reports from the mining districts of Southwestern Oregon are extremely meager. In Jackson County there were many placer-claims operated during the year, but they paid but poorly, the average yield from some fifty of the principal claims being but \$3 per day per hand. Wages are \$50 per month, and other expenses absorb the remaining margin. The industry is falling mainly into the hands of Chinamen, who conceal as far as possible both their expenses and their profits.

In Coos County there has been some successful placer-mining. The Pioneer Co., Colonel John Lane, superintendent, produced some \$12,000 during the year ending July 1, 1870. Placer mining along the beaches of Northern California and Oregon has also been continued, and the yield is reported at \$10 per day per hand for a small number of men and for a precarious season. Stoppages and other expenses reduce profits to a low figure. It is found, moreover, that these beach deposits though apparently renewed after storms, high tides, etc., are not inexhaustible, but may be gradually worked out like any others. This naturally follows from their origin, which is undoubtedly the quartz veins of the coast range.

Of quartz-mining in this part of the State I have nothing to report this year. A few enterprises, alluded to in a former report, have been feebly pushed, but the extent of operations has not been such as to warrant me in causing a special examination to be made. I am under obligations, to Mr. Samuel C. Mills, agent of Wells, Fargo & Co at Portland, for the following figures of express shipments of bullion for 1870:

January	\$108,300	November	\$169,200
February	98,000	December	<u>212,800</u>
March	18,400	Total	1,547,800
April	88,800	Private hands	
May	43,500	(estimated)	<u>250,000</u>
June	165,700	Total from	1,797,800
July	170,400	Portland	
August	168,700		
September	151,900		
October	152,100		

The treasure shipments of Wells, Fargo & Co. in previous years have been as follows:

1864	\$6,200,000	1867	\$4,000,000
1865	5,800,000	1868	3,037,000
1866	5,400,000	1869	2,559,000

The reduction in the product of gold is not so great as here appears, since the diversion of the bullion from Eastern Oregon to other routes, and the transmission of considerable quantities in private hands or through bankers, (in 1868 \$640,850, and in 1869 \$419,657, by a single house in Portland) account for much of the diminution.

I estimate the production of Oregon and Washington (very little gold, however,

having come during 1870 from the latter Territory) at \$3,000,000, the same as last year, according to the latest statement in my report, on page 205, which corrects the estimate of \$4,000,000 in my introductory letter. The reason of this and other similar discrepancies is explained elsewhere.

As I have indicated, the principal mining industry of the precious metals in Oregon is now to be found in the eastern part of the State, on both sides of the Blue Range.

Meager returns from Canon City and neighboring districts indicate a somewhat increased production, though mainly by reason of the influx of Chinese, who succeed, by purchase in most cases, to the claims formerly worked by the whites, and who, by their superior patience and economy, continue the production of gold, in many localities where it would otherwise cease. It is very difficult, however, to ascertain the amount of production from such sources. Thus the reports from sixty four placer-claims in Grant County, eleven of which are worked by white men with paid labor, and the remainder by Chinese owners, show for the former a yield of \$4 per day per hand, and for the latter only \$1.30. There is no doubt that the Chinese have in this case concealed the actual amount of their production, reporting an aggregate of about \$126,000 when the true amount must have been at least twice as great. Some of the claims worked by whites yield during the season \$10,000 or \$12,000. I have not heard of any cases during the last year in which single claims have exceeded the latter figure.

Hydraulic mining has been carried on to some extent in Upper Canon, Maryville, Olive Creek, and Quartz Gulch districts, and especially at Granite Creek, where six claims were reported in June, 1870. The average season is between four and five months; the average wages, \$4 per day for white labor; and the average yield \$8 per day per hand. Among the larger operations are those of Thompson & Co. near Maryville, producing about \$10,000 in nine months with four men; Dick Eagan & Co., Granite Creek, ten men, three months, \$16,000; W. H. Clark, Upper Canon, three men, two months, \$8,000.

Quartz mining has made but little progress since my last report. The Prairie Diggings mine, therein described has been worked somewhat, and reports a product of about \$10,000 for the year ending June, 1870. The quartz is of a low grade, but very abundant and cheaply mined and milled. Quartz mining operations by the John Day Company and others in Elk district are spoken of as highly promising, but have not yet attained to a regular production.

This part of Oregon suffers from imperfect and costly communication with commercial centers. There is a good road from Canon City to the Dalles, and another (no, I believe, disused) to Boise; but the transportation of the mails exclusively by way of Umatilla has left the settlements on the John Day and its tributaries stranded, as it were. The discontinuance, since the Indian war, of the military posts in this region has deprived the farmers of the fertile bottomlands of their best market, and checked to some extent the further development of agriculture. The discontinuance, since the Indian War, of the military posts in this region has deprived the farmers of the fertile bottomlands of their best market and checked to some extent the further development of agriculture. A greater activity and progress may be observed on the east of the Blue Range, in Baker and Union Counties.

I am indebted to Mr. E. W. Reynolds, agent of Wells, Fargo & Co at Baker City, for much of the following information concerning the operations of 1870 in that part of Oregon:

The shipments of Wells, Fargo & Co from Baker City for 9 months of 1870 averaged \$50,000 per month of gold dust and bullion, and the amount carried out of the

\$10,000 a month for that period. For the three months of comparative inactivity \$20,000 per month will cover both express and private shipments. The total shipments of gold from Eastern Oregon, exclusive of Cañon City and other districts west of the Blue Range, amount therefore for 1870 to \$600,000. The following items refer to the different districts here included, with regard to which my last report may be consulted for particulars of location, etc.:

Pocahontas district.—The placer-mines of this district have done very well, considering the dry season, and a number of rich discoveries have been made in the way of quartz lodes. Among these the Gunboat lode is perhaps the most prominent. It was discovered beneath a gulch deposit after the auriferous dirt had been washed off. The surface-rock is reported to be worth \$100 per ton; a lot crushed at the Ruckel mill, Baker City, containing, it is said, much wall-rock, yielded \$30 per ton. Messrs. Simonton and Olds are about to remove the Humboldt Mill from Eagle Creek to the vicinity of the Gunboat lode. This is a steam-mill of twenty stamps, and will run on custom rock. In the same district the Young America, (4 feet wide, decomposed quartz,) Stonewall Jackson, Kelley, and other lodes promise to yield fair milling ore.

Auburn.—Placer-mining in this once famous district has not been very lively during the year, judging from the business of the Auburn Canal Company, which sold but little water. The large amount of gulch-mining heretofore done in this neighborhood, however, has left the cañons in excellent condition for the discovery of quartz lodes, and accordingly I am not surprised to learn that several promising veins have been found. One of these, the Oro Fino, about half a mile from Auburn, promises exceedingly well. It is owned by E. M. White & Co., and has already been opened to the depth of 104 feet, showing a vein of 18 inches, carrying free gold in white and decomposed quartz.

Fort Sumter, Granite, and Olive Creek districts, in Grant County, all did well in placer-mining during 1870.

Humboldt Basin has suffered some from the dry season, but has produced pretty well, having been blessed by a considerable influx of Chinese from other districts.

Amelia City appears to have fallen off somewhat, but will doubtless revive when the completion of the El Dorado ditch furnishes an abundant supply of water.

El Dorado or Shasta district* promises to become this year one of the most important in Eastern Oregon. The ditch commenced by Carter and Packwood has been sold to a Chicago company, which has enlarged it to 8½ feet on the top, 6 feet at the bottom, and 3 feet in depth, thus giving it a capacity of over 3,000 inches. Fifty-two miles of it have been already completed, and it is expected that thirty-nine miles more will be constructed this spring, bringing into camp the waters of the Malheur and Burnt Rivers, and furnishing an unfailing supply to a large area of rich placer-ground. The mines of Malheur City and Amelia City will be supplied from this ditch. The name of the company is the Malheur and Burnt River Consolidated Ditch and Mining Company; the president is Mr. B. D. Buford, Rock Island, Illinois; and the superintendent, Mr. J. H. Johnson, El Dorado, Oregon. The company runs two stores, receiving goods direct from Chicago.

Eagle Creek, Cooster, or Koester district has an excellent prospect for the future. There are no new developments reported in quartz-mining;

* See my report of last year, pp. 223, 229. On the former page Shasta is miscalled Sparta, by a typographical error.

but the great hinderance to the placer-mines, the scarcity and dearness of water, is in a fair way of removal. Messrs. Packwood and Stewart, of the old Burnt River Ditch Company of Eldorado, have surveyed a ditch to bring the Eagle Creek water twenty-one miles into Koester diggings. It will be completed next September, at a cost of about \$50,000; and it is believed that it will afford facilities for a largely increased production of gold from the placers of this part of Union County, which are known to be extensive and valuable. Blue Gulch, Horn Gulch, Maiden Gulch, Red Gulch, and other localities have given high returns to prospectors, the report being "50 cents to three pans of dirt." The gold is of fine quality.

The old Ruckel or Union mine (see my report of last year, p. 230) is now worked by Messrs. Brown and Virtue. They have sunk a shaft from the lowest tunnel level, over 50 feet, and intend to go to a depth of 200, drifting east and west at 100 feet. The presence of water has necessitated the introduction of a pump, which is worked by a one-horse whim. The ledge is 20 inches wide at the bottom and is dipping north. The quartz is somewhat easier to extract than it was in the upper levels. The shaft is 6 feet by 9. These workings are on the Rocky Fellow, which was the vein principally worked by Colonel Ruckel, though the Union, which is probably a branch, has yielded well. It will be seen that operations at this mine are confined mainly to preparation of new stopping-ground, as might be expected from the condition of the work as described in my last report. The foregoing particulars are received from Mr. A. H. Brown, one of the present proprietors:

Rye Valley district has done as well as the dry season would permit in placer-mining. Some little prospecting for quartz has been done, and partial success rewarded the labors of the seekers—W. Green having discovered a small vein of gold-bearing quartz in the vicinity of "Humphrey's Gulch," which prospects well. This gulch has remunerated the placer-miners engaged there for a number of years, and perhaps this discovery may lead to a more extensive exploration of that locality, possibly unearthing the source from whence these placer-claims have been fed.

Little attention for the past year has been paid to the numerous ribbon silver-bearing veins discovered in the district. The presumed reason lies in other and more pressing pursuits of the locators. What little work has been done has rewarded the prospectors by disclosing ore which, by assay, yields, in some cases, as high as \$572 per ton. The Monumental, Green Discovery, Mountain, Washington, and Rising Sun gave flattering indications. With the exception of the two first-named veins, however, the large number of the locations in each company has been a serious drawback to development. But the time is drawing near when, by law, the greater portion of these locations are declared vacant through non-performance of work; and it is hoped the claims will pass into more energetic hands.

About 30,000 feet of lumber for the Rye Valley Bed Rock flume was on the ground last December, and it was expected that work would be commenced on that undertaking when the season permitted.

The following account of the early settlement, character, and present development of the mines of Union and Baker Counties was prepared by Mr. W. H. Packwood, of Baker City:

In the fall of 1861 Mr. Griffin and party of men, in prospecting in the Blue Mountain Range, discovered what is known as Griffin Gulch, a tributary of South Powder River. The gold found was coarse, and in sufficient quantities to warrant them in locating for mining purposes. At that time the only settlement east of Blue Mountains—I might

say in Oregon south to the California line, and eastward to Snake River—was that of Mr. B. Brown and a few others, in Grand Ronde Valley, for grazing purposes. George Abbott and two or three other men had started beef-cattle from Umatilla Valley for Salmon River mines, but were driven back from Snake River to Grand Ronde Valley by the Indians and snow. Here they wintered their cattle without any loss, and he it remembered this was the most destructive winter for cattle since the first settlement of Oregon. To get supplies to Griffin Gulch the miners had to go to Walla-Walla, or the Dalles, a distance of one hundred and fifty to two hundred and fifty miles.

As soon as the fact that paying gold mines had been discovered on the waters of Powder River had become known, Mr. Abbott drove the cattle designed for Salmon River to Blue Cañon, where Auburn now stands, which had been found by Mr. Kirkpatrick, George Hall, and others. Blue Cañon was distant from the Discovery or Griffin Gulch about four miles. The character of the gold found was excellent, from fine grains to nuggets weighing from one to three and more ounces. Mr. Abbott believed that a new and valuable gold-field was discovered here, and going to the Dalles, together with Mr. Knight, bought and shipped some goods by pack-train for Blue Cañon. Mr. Du Gay also arrived with goods about the same time; Messrs. Cranston, Moore, Norcross, and others soon followed with goods. Before and after all these, miners from every point of the compass came pouring in, ready for anything new in the way of mining. The town of Auburn was laid out in lots about June 16, 1862. Mr. J. W. Peters and Knight, Abbott & Packwood, had buildings up for stores, and moved from their tents into them before the 4th of July following. The population in that vicinity dependent for supplies from Auburn was not less than from three to four thousand persons by September of the same year. At one time, in 1862 and 1863, Auburn had forty stores and saloons. There was a large number of emigrants from the States that year for Salmon River and Oregon. A large proportion of these remained in the vicinity of Auburn and Powder River Valley.

Auburn is justly entitled to be called the mother of mining camps in Eastern Oregon and Western Idaho. From Auburn prospecting parties were fitted out and the country explored in every direction. Grimes's party discovered Grimes's Creek; in fact, the great Boise Basin. Ross Smith, Jack Long, and others found Granite Creek, and laid out the town of Independence on this creek about July 4, 1862. Cañon City was largely settled by Auburnites. The Owyhee mines were the result of discoveries made by Uncle Tom Turner's party in search of Sinker Creek, and by a party from Idaho which discovered Reynolds and Jordan Creek. During this time but little work, permanent in its character, was done, miners being generally on the hunt for strikes, or a big thing. They did not begin to look for claims yielding under eight to sixteen dollars per day per hand until about 1864. On the contrary, each miner seemed to be determined to expend his last dollar before locating. At the same time every miner brought with him his peculiar ideas of a mining country, formed in the mines they happened to come from. We had miners from California, Australia, Cariboo, Florence, Pike's Peak, and Mexico; but the surface indications here do not precisely resemble any of the above-named mining localities. Because it was not dry and barren, as in most mining districts, the country remained almost wholly unprospected. There was another class, however, that kept at work, regardless of the surface indications in the country, and to this class is owing almost entirely the permanent settlement of these two counties as mining districts. Almost wholly without other capital than that obtained from the ground worked, they have, in eight years, demonstrated the fact that Baker and Union Counties are both rich, and almost unlimited, except by their own boundaries, as to the extent of their placer-mines.

The character of the mining country is this: It is covered with a fine, loamy soil, and with excellent bunch and rye grass. In many places decomposed quartz and float slate, granite and volcanic rocks, appear. The general appearance would lead to the belief that the country has been under water for a long period of time, and that large streams of water have crossed the country in a different direction from that in which they now run. In many places heavy deposits or channels of washed gravel have been found. The country is broken up in gulches, flats, and hills, fronting on and leading into and surrounding the main large valleys that lie on the present main streams of water. In other words, the mines are confined to the table-lands and foothills of the mountains. The depth of the mining lands runs from almost bare bed-rock to sixty and more feet deep, and, to work it with profit, water is required for ground-sluicing and hydraulic mining. In many places the ground is sufficiently rich to pay working in rockers. The entire country, up to this time, has been almost wholly dependent on snow-water for mining purposes, and the country is filled, in almost every district, with what are here usually called dry ditches. The fall of snow is irregular; some years the dry ditches have water twenty days, other years from forty to sixty days. There are some permanent streams that furnish water sufficient for large ditches; but as these streams cut well back, and lie deep down in the mountains, long lines of ditches are required to convey them to the mines, and to build long ditches capital

must be obtained. The living streams available for ditches are Burnt, Malheur, and Powder Rivers, and Eagle Creek. Among the first ditches built here were those of Conoyer on Powder River, Davidson & Carter's, and Kirkpatrick & Co.'s; for Auburn mines the water being taken from Elk Creek. The Griffin, Stafford, and Littlefield ditch from Elk Creek to Griffin Gulch.

W. H. Packwood, Abbott, Fuller, Ward, and others organized the Auburn Water Company in 1862, about September 15th to 20th; sold in November to some Portland capitalists—Messrs. Ladd, Brooke, Thompson, Ainsworth, and others, who carried the enterprise through the next year. This enterprise was one of the greatest inducements to the permanent settlement of Powder River Valley, and the capital invested by the last-named gentleman is almost the only outside capital ever invested in these two counties.

Packwood, Perkins, Statsman, and Kitchen built the Clark's Creek ditch in spring of 1863, which ditch has been and is now a good piece of paying property. The Rye Valley ditch was built in 1864, and from time to time almost all the springs in the mountains and streams that run water while the snow lasts have been improved for mining purposes. The main or living streams so far are idle. In 1863, W. H. Packwood, Ira Ward, Robert Kitchen, and J. N. Hull organized the Burnt River Ditch and Mining Company. This was an undertaking and enterprise of first magnitude, and founded mere on the belief as to the general existence of paying gold mines on the Burnt River and Willow Creek mountain sides than from any positive knowledge of their existence. In the fall of 1864, W. H. Packwood hired a party of men and sent them to prospect the Willow Creek side of the mountain. They found from a color to three bits to the pan, gold coarse order. They could find it in almost every place, in the flats, hills, and gulches, in paying quantities. In the fall of 1863, A. C. Goodrich ran trial-lines for a ditch. In 1864, Charles Barrett, civil engineer, surveyed and staked the line for a ditch from Burnt River to Shasta Pass or Gap.

Now, to understand the character of the enterprise, it is necessary to know that Burnt River and Willow Creek are two streams rising in a spur of the Blue Mountain, and running parallel with each other a distance of from forty to fifty miles, separated by a dividing mountain that rises in altitude from one to three thousand feet. The slopes of the divide separate Burnt River and Willow Creek from each other, on an average, about fifteen miles. Now, the object of the company in selecting Shasta Pass—a low gap in the main divide—was to run a line of ditch in such manner as to command both sides of the mountain. By Mr. Barrett's survey, the distance from Burnt River to Shasta Pass was found to be over eighty-eight miles for line of ditch. By commanding Shasta Pass as a terminal point, it was believed by the company that their line would command a larger extent of placer-mines than was ever before commanded by any ditch in the history of mining in California or elsewhere. From Shasta Pass, the ditch-line could be extended on the Willow Creek slope a distance of about thirty miles to Snake River. On the Burnt River slope, it could be prolonged sixty and more miles, Snake River being the only limit to its extension. After Mr. Barrett's survey in 1864, the Indians were hostile for over two years, so as to render life and property unsafe, and no further work was done until 1867. At this time Mr. T. J. Carter, of Portland, became interested in the company, and work was resumed in June, 1867—Mr. T. J. Carter, president, and W. H. Packwood, secretary; capital stock, \$144,000. In 1867, 1868, and 1869, the company completed nearly fifty-eight miles of the main line, commencing at Shasta Pass and running to water. They expended over \$100,000 on the work of construction in that time. Their line of ditch in these fifty-eight miles took in the small streams fed by snow, and had tapped East Camp Creek. In the spring of 1870, the company puddled their ditch with the snow-water and Camp Creek, and had water for sale for a few weeks on the Willow Creek side of the mountain. The water sold by them realized an average of about 60 cents per inch for ten hours' use.

In the spring of 1869, Mr. Uriah Perry, an old ditch-man in California, came into this country, and having examined the mines, and knowing practically that Burnt River and Malheur were the only available living streams of water in this country, and that the placers were extensive, he projected forming a company in Iowa and Illinois for the purpose of securing the water rights and mining extensively. He enlisted Mr. J. H. Johnson, who went back to Chicago and there succeeded in inducing Mr. Buford, of Rock Island, to come out and examine the country. The result was, after some weeks' examination, that Mr. Buford purchased nearly the entire stock and control of the Burnt River Ditch Company's property, including large tracts of mining land, on liberal terms, fair profit to seller and purchaser. Mr. Buford, being a man of great wealth, proposed to double the size or capacity of the ditch constructed by Carter and Packwood. Their ditch was designed to convey and store up sufficient water to furnish about 2,000 inches for ten hours. Mr. Buford's directions would require the ditch to be enlarged to about 8 feet top, 6 feet bottom, able to carry water 3 feet deep. Mr. Johnson, secretary and superintendent for the company, pressed the work in good and bad weather, from October, 1870, to January, 1871, and has the ditch about completed to the size above named, or very near it. A light wagon or buggy can be driven

in the ditch, and two horsemen can ride through it abreast comfortably. This company is known as the Malheur and Burnt River Consolidated Ditch and Mining Company; Mr. Buford, president; J. H. Johnson, secretary; capital stock, \$1,000,000. Mr. Buford having secured the Malheur River water, this company now own and control all the available living water for mining purposes in these districts, to wit: Eldorado, Malheur, Amelia City, Rye Valley district, Clark's Creek, and Burnt River Slope—say, at a low estimate, mining districts that together would form one district sixty miles long by ten to twenty wide.

All the water in this district is from the snow, or natural water, and usually it only affords a supply for a small number of claims for a few weeks. This is the largest ditch in the State of Oregon, and will be one of the longest on the Pacific coast when completed, as in time it will be extended sixty miles from Shasta Pass. About thirty miles more will finish the main line or trunk, and the company intend doing that work early this spring. One objection to long ditches is loss from evaporation. This line of ditch lies on the north and west side of the mountain, and has for feeders on the line not less than eighteen streams of water that run from 5 to 100 inches each, and should more than make good all loss by evaporation. The country through which the line runs is a favorable one for ditching, being a clay loam and slate country. The ditch, when completed for running water, may cost from two hundred and fifty to three hundred thousand dollars. Very many will say: Will the country and mines justify the investment? We have no hesitation in saying it will pay for an investment of \$1,000,000 for water to supply the named mining districts by the owners using even ordinary care in the management of the same. Let us see. The old company sold water, first head, 30 cents; second head, 20 cents; third head; 10 cents per inch; fourth head, 5 cents. Average about 60 cents per inch for ten hours. Many persons may not understand what we call in mining, first, second head, etc. It is the same water first sold being sold over several times, each time for a lower price than before, as the water depreciates in value from use. In Mormon Basin, and through Mr. Kelly's Ditch at Amelia, the water of the upper camp is used in the lower from twelve to fifteen times. The Malheur and Burnt River Ditch Company, when their works are completed, can sell say 4,000 inches for ten hours. Say that they only realize for all uses 25 cents per inch, (they should at a lower estimate realize 40 cents to 50 cents, as the water will be used over three times in many places,) their sales would amount to \$1,000 per day. They can run and sell water from two hundred and thirty to two hundred and seventy days each year. Their current expenses should not exceed from fifteen to twenty-five thousand dollars per year, and become less with age on the ditch. Again, the question, How long would this last? The fact is, the available supply of water for the districts named cannot equal the demand, and the water that can be obtained will not suffice to work out the mines on this line in the next one hundred years.

A few years ago a few men believed this true; to-day thousands do. Again, independent of selling water, there are other inducements for investments in ditches which did not exist a few years ago. In this case the one company owning an absolute monopoly of the water can, if they desire, purchase at nominal prices from the United States and others large tracts of mining land, and by them conveying water so as to be available to mine their land can raise its value immensely; or, as in California, they can construct large flumes and hydraulics, mine extensively with large streams of water, so as to make the water save the labor of men.

Chinamen are in the country and can be hired cheaply, or ground could be rented to them with water to work it. The monopoly a ditch company has here gives them an absolute a right to tax the mines in some form or other as the Government has to tax the people. Another thing is this, poor and rich land can be worked now at the same time; in earlier days only the rich land could be worked in consequence of high prices. Now, however, a man can live quite cheaply, labor can be had for \$2 50 to \$4 per day, where in past years it was from \$5 to \$8; hence, when water can be obtained, every class of mines can be worked; for it is a truth that miners will mine ground for less than wages, and take the chance of more than wages. The gold dust in Eldorado, Malheur, Amelia, Clark's Creek, and Burnt River Slope is worth from \$16 to \$18 per ounce.

The largest piece ever found in Baker County was at Gimletville, a small camp on Burnt River. It was worth nearly \$4,000. Chinamen have both bought claims at nominal prices and have paid as high as \$35,000 for them. The completion of the Malheur and Burnt River ditch will give steady and permanent employment to a large number of miners, and add to and stimulate the agricultural and grazing interests of Baker and Union Counties.

Following down Burnt River from the mouth of Clark's Creek to Snake River, a distance of fifty miles, the river cuts through the mountain range that runs northward and parallel with Snake River. So far as the river has been tried, on the bars and hills, on and near the river, gold has been found in paying quantities. In fact, from one to fifty dollars per day have been made with the rocker. From Clark's Creek to Express Ranch, for twelve miles the river forms a cañon. In places hundreds of feet

above the river, bars and hills are found that would pay largely with water for hydraulics and flumes. Some of these hills and bars have been drifted and worked in rockers, and good returns made in that manner; but as the gold is not confined to the bed-rock, but found in all the dirt, in some locations 20 to 60 feet deep, no very profitable work can be done without an abundance of water and flumes. There is also every reason to believe that the bed of the river is rich for at least twelve miles in the cañon. To open and work the bed of the stream, large flumes and derricks would be required to operate successfully.

But few miners have, singly or in the aggregate, money to invest in carrying on an enterprise of this character; and before they would consolidate themselves for an enterprise of this or any other kind requiring heavy outlay, they must first exhaust the more easily accessible placers, on the same principle precisely that the shallow placers were nearly or quite worked out before the hills were opened in California. The hills and bars in the cañon can never be worked until the Malheur and Burnt River Ditch Company convey water to work them. A number of low-line ditches are taken out and in course of construction on Burnt River below Express Ranch. These low-line ditches are principally built by the miners, small in size, not high enough for hydraulic mining, and seldom exceed from one to three miles in length. However, there is a ditch company incorporated, with a large capital stock, in Chicago, Mr. W. P. Richmond, president; Mr. McHenry, secretary; and Mr. Donnell, superintendent. Their object is to construct one or more large ditches from the vicinity of Express Ranch, or mouth of the cañon just named above the ranch, and convey the water down over the bars and foot-hills for sale and to mine their own land. This company would have a line of ditch that would command a large tract of valuable land for hydraulic and ground-slucing, and their line of ditches would, or can be, extended to cover good mining land to Snake River, say forty miles.

Mr. C. W. Durkee, of Express Ranch, has also commenced a line of ditch out of Burnt River, that would be some 200 feet higher on the hills than Mr. Richmond's line of ditch. Both ditches would be nearly the same length, command the same country, with this exception, Mr. Durkee's being highest on the mountain, would command a large tract of mining land lying between the two ditches. Towering high on the mountain, above all these lines of ditches, will come in time a branch ditch from the Shasta Pass, owned by the Malheur and Burnt River Ditch and Mining Company, that will lie on the mountain-side a thousand feet higher than any other ditch can ever go; and yet high above this line lie Sutherland's mines, where, with snow-water in the spring for from four to six weeks, men make what would be in the older States good pay for a year's labor. Higher still is the far-famed Mormon Basin, situated on the summit of the mountain and near the center of all the camps named. Few camps have been found richer than Mormon Basin. I am reliably informed that one thousand buckets of dirt have yielded as high as one thousand dollars in rocking. As the supply of water in the basin is very limited, the mining population has seldom exceeded from three to five hundred persons.

There are a number of small ditches on South Powder River, which enable from three to five hundred Chinamen to make a living at mining. Messrs. McCrary, Tracy, Ingraham, and others own a number of small ditches on Rock Creek and North Powder. Some of them are five miles long. They command an extensive hydraulic and ground-slucing district, that pays from \$2 to \$10 per day to the man, with good water privileges. In the foot-hills near Pocatontas a number of good claims have been found, the gold being very coarse. One piece found last summer was worth \$247. Salmon Creek, in same district, is opened in several places, and found good. Distant about thirty miles north of Burnt River country lies what are called the Eagle Creek mines, in Union County. The range and character of gold is the same as in the Burnt River country. The Eagle Creek mines have been worked with rockers for some years, and a very large amount of money taken from them in that way; now there is a ditch under construction to supply the wants of that country. The following, from the Bedrock Democrat of Baker City, gives the latest information on the subject of these mines:

"EAGLE CREEK AND ITS PROSPECTS.—For some time past we have heard it rumored that the construction of a large ditch in what is known as the Eagle Creek country was contemplated. We are now able to state that the waters of Eagle Creek have been secured, and that C. M. Foster, United States surveyor of mining lands in Eastern Oregon, has run trial-lines, and surveyed and staked out over sixteen miles of the main line of the ditch. It will be about twenty-two miles in length, and is intended to have a capacity large enough, with the aid of reservoirs, to run and sell 3,000 inches of water in the Shanghai, Rooster, and Powder River Slope mining districts. Work on the ditch will be commenced as early as April; if the weather permits, in March next. Mr. George Carter is now looking for a good site on which to cut the flume lumber, and intends to be ready for operations by the 1st of April, the amount of lumber being about 300,000 feet. It is the intention of those engaged in the enterprise to have a ditch completed and conveying water between the 1st of August and September. The

principal part of the work on the ditch will be let to two Chinamen, one of Baker City and the other of Auburn, who will put on between two and three hundred Chinamen, and finish the ditch, with ease, by the time the flumes can be built. The projectors of the work, we are assured, have perfected the financial arrangements, and will safely carry the enterprise through to completion.

"Messrs. Bowen & Cranston, of this place, are going over to select a place for a store, which will probably form a nucleus for a town in that section of the country. They will take a number one selected stock, full and complete in every department required in a new mining country. Both having had large experience as pioneer merchants of Auburn, Idaho, and Clark's Creek, they are certainly well qualified for such an undertaking. They design being ready for trade, in the new location, by or before the 1st of next April. C. M. Foster has surveyed a number of mineral land claims in that country, under the United States mineral land act—the size of them all the way from ten to eighty acres. Quite a number of claims, from ten to forty acres, have been located by some of our pioneer miners from Auburn—among them are George Slocum, D. Moore, C. E. Smith, and Judge White. The Eagle Creek country, through portions of which this ditch will be constructed, is known to be very rich in auriferous deposits; it is also extensive. In gulch, creek, flat, and hill are paying gold mines, and all now wanted is a good supply of water. When that is secured, the Eagle Creek country will be second to none for mining purposes; and it will be equal to any camp in Oregon. It is well known here who are the projectors of this enterprise; but as Portland and eastern parties desire an interest, the matter of incorporation will be postponed, but the work will be prosecuted without delay at the time specified. The Eagle Creek enterprise and mines are in Union County, and are destined to add largely to the wealth and population of that county. Union and Baker are the richest counties in Oregon in mineral resources."

W. H. Packwood and Alexander Stewart are the projectors of this enterprise. The cost of the ditch will be not less than \$100,000, with reservoirs. They have a never-failing stream of water from 1,500 to 2,000 inches (miner's measure) as a source of supply. After building about eleven miles, their sales of water will amount to from \$50 to \$100 daily. They can sell all their water from two to five times and realize from 30 to 40 cents per inch, and it is not unreasonable to believe from what is known of the extent and character of the country that this line of ditch will repay the entire outlay in dividends in one year from its completion. A town named Sparta has been laid off in that vicinity, and buildings are being erected for stores, etc., at this time, and numbers are preparing to build.

From the article in the Democrat, you will see that miners are locating mining lands in this district under the United States mineral land act. This is the first land ever located in Oregon in that way, so far as we can learn. All mining lands have been owned by squatter, or possessory title character heretofore. In consequence of the manner of holding under the old style, men have been very reserved in the matter of even taking up, or investing money in mining lands, unless actually prepared to occupy and work the same. Representation is ever a prominent feature in the mines, and if a man has invested thousands of dollars in land and fails to represent it properly, he forfeits all title if any one should step in and represent the land.

Representing varies in different localities. Some camps require \$25 in labor in the year on or for each claim owned, water or no water. Some require representing each year about the time water is expected; and if no water can be obtained for mining, notices are to be renewed on boundaries, and claims laid by. All claims require representation by actual labor on an average one day in seven when water can be obtained.

Now, under such circumstances it is not a cause for surprise that outside land—or land on which water can only be obtained at great expense—should remain unlocated or investments made to bring it into market when the title to it could only be of a possessory character, entailing through representation each year, for each claim owned, from three to four times the Government price for same. This United States law will create a revolution in title, and by doing that representation as now practiced will cease. While it is true that this law may induce larger investments in mining lands than heretofore—in some cases to the injury of the poor man—it is believed by many (aside from being a source of revenue to the Government) that an absolute security of title will induce investments of capital to improve, bring water, erect hydraulics, construct flumes, etc., on a large portion of our mineral lands that poor men could not now or hereafter operate. Should such be the result, as we are inclined to believe that it will be, it will even, while making the rich richer, benefit the laboring man and the country more than under the present practice, as then thousands can be employed in fields created solely by the aid of capital.

The yearly gold product of our mines cannot have been less than from one to one and one-half million dollars from 1863 to 1870. The gold has been, we may say, the sole product of labor. The number of miners has varied from one to three thousand, averaging for several years about fifteen hundred. The average mining season has not been three months per year. With the amount of water that can be obtained by means

of the ditches now contemplated, our mining population and gold product should be from three to five times greater than heretofore.

So far we have no more than cracked the shell of our mines, the core and heart still lying in the hills and old river-channels, and we have only been slowly but surely developing this fact. In the Blue Mountains, on the head of Grande Ronde River, good land has been found, and indications of extensive hill-mines. Good copper and coal have been found in Union and Baker Counties, on Snake River. T. J. Carter, W. H. Packwood, and Isaac and John Garrison expended several thousand dollars in prospecting for coal on Snake River. Sufficient work was done to show the existence of good coal deposits of a bituminous character; but as there was no demand except for blacksmiths' use, it would not pay them to continue work.

Our quartz interests are in their infancy. So far the Rockyfellow lode has been worked more than any other vein or lode in Baker or Union Counties. This lode has been worked for the past five years, paying, we are informed, well and regularly. The present owners, Messrs. Brown & Virtue, are down about 400 feet, have a well-defined lode from 20 to 30 inches wide. The quartz yields them from \$40 to \$60 per ton. The gold is worth \$19 50 per ounce. The owners have a ten-stamp mill at Baker City; obtain their power to drive the mill from a ditch from Powder River. The lode is situated about seven miles from Baker, on the divide between Powder and Burnt Rivers. This lode has yielded thousands of tons of good rock, and from present indications is inexhaustible, and the mine probably contains wealth sufficient to pay for working for ages to come. E. M. White, at Auburn, is down over 110 feet on what there is every reason to believe is a true vein. The vein is almost perpendicular, with well-defined wall-rock. The rock contains fine gold. The vein is from 6 to 30 inches wide, and improves as they go down. Mr. White intends soon commencing a tunnel, calculated to tap the lode about 200 feet below the surface. He has taken out in sinking his shaft, almost beyond doubt, quartz sufficient to pay for erecting a mill, which he intends doing this summer. The rock has been worked in an arrastra, and yielded nearly \$90 per ton. Quite a number of other ledges have been found in the same vicinity. Up on South Powder a number of fine ledges have been found.

Near Pochontas a ten-stamp mill is now being erected by Messrs. Olds & McMurran, and is to do custom-work. Water, for milling, and wood, for steam, are abundant, and cheap living can be had, as Pochontas is situated in the edge of one of the best farming districts in Eastern Oregon. Quartz is abundant in the foot-hills and mountains back of Pochontas. Many lodes are partially opened. Some have been worked with an arrastra, some with hand-mortars, and the results are extremely favorable. In fact, the rock was so well known that I understand that Messrs. Olds & McMurran have more than rock sufficient engaged for crushing from respectable parties to pay the entire cost of erecting a mill. The Young America is about 4 feet. A tunnel is being run to strike it deep down in the hill. The Gunboat is near 2 feet wide 30 feet down, and the rock is, without doubt, extremely rich. On Salmon Creek, in same vicinity, a ledge has been found recently that 12 feet down is nearly 4 feet wide, and from which we have seen as rich rock as we ever saw from California. In Rye Valley a large number of ledges have been found in which silver predominates; so far no capital has been invested to develop them. At Hagerm, Union County, a small mill is owned by George Carter and others, in connection with a number of ledges. On one ledge they are down about 120 feet with a tunnel. The vein is, in places, as much as 30 inches wide; rock is abundant; all the rock pays for milling, and in some places he has found rock that milled about \$500 per ton. There are a large number of ledges found in that county that prospect well.

As I said before, no capital has been invested in Baker and Union Counties for the purpose of developing mining interests, except the amount named from Portland. Our placer and hill mines and quartz are of such a character as to require capital and labor united to develop them properly. When developed, as they will be sooner or later, they will be found to contain unbounded mineral wealth, and to be as certain, safe, and reliable counties for good paying returns on investments of that character, as can be found from Colorado to the Pacific coast. The population of Union and Baker Counties has probably never exceeded 12,000 persons, and has not, we think, been less than 8,000 since 1862. The climate of the country is healthy, equal to any part of the Pacific coast. Both counties have extensive farming land and grazing country almost unequalled, and in fact not surpassed, in Oregon or California. Both counties have been wholly dependent on Portland for merchandise, but the completion of the Union and Central Pacific Railroads has given Portland competitors for our trade in the enterprising merchants of Chicago.

Last fall a Chicago merchant shipped a fair stock of merchandise to Eldorado, and we learn he is so well satisfied with his venture that next spring he will ship a large stock to Eldorado via Kelton and Boise City. This competition will be of great benefit to the people of Baker and Union Counties. Portland having had a monopoly of our trade, we have been taxed as high, and higher on an average, for merchandise than the same sold in Idaho, from one to three hundred miles farther inland than we were

from Portland. We trust our Senators and Representatives may induce Congress to pass a bill for a railroad to connect the Columbia River and Central Pacific or Union Railroads, such as to insure its early building. Such a road would naturally and necessarily run very near the center of both counties, and would, by giving means of transportation for our products, lead to the settlement of millions of acres of land valuable for farming and grazing purposes. With such road completed, we do not know of any part of the Pacific coast that would offer better inducements to the emigrant for permanent homes than in these two counties. Nor do we believe that, with railroad facilities, any two counties in the great basin from the Rocky Mountains to the Sierras or Cascades offer to the capitalist mining investments of a more permanent character, on which certain, safe, and speedy returns can be expected. From 1862 to 1871 our imports have been paid in gold from our mines; with increased facilities for transportation we could pay in wool, flour, bacon, butter, cheese, beef, and many other articles of produce that now depend solely on the mines for a market. The gold yield should not be one million, but from three to five million dollars yearly from these two counties, and from agricultural and grazing products a like sum. The same may be said of Umatilla and Wasco Counties as to health, grazing, and farming, but their mineral resources are limited. These five counties—Baker, Union, Grant, Umatilla, and Wasco—embrace what is known as Eastern Oregon, an area of country equal in extent to many of our largest States.

CHAPTER IV.

IDAHO.

This Territory manifests a considerable decrease in its product of gold and silver, as may be seen from the following detailed estimate for the calendar year 1870, kindly prepared for me by Mr. W. A. Atlee, agent of Wells, Fargo & Co., at Boise City. Mr. Atlee has taken great pains in the preparation of this table, corresponding with all the express agents of the Territory, and perfecting his estimates slowly and laboriously. His position, experience, and intimate acquaintance with the field entitle his work to confidence.*

In this list, the production is arranged according to points of shipment.

Placerville.....	\$184,428
Centerville.....	249,839
Pioneer City.....	259,000
Idaho City.....	2,600,584
Boise City.....	332,101
Owyhee.....	842,935
Lemhi County.....	350,000
Lewiston.....	702,613
Wallula.....	57,500
Walla-Walla.....	600,000
Umatilla.....	280,000
Loon Creek, Dead Wood, Snake River, and other diggings	150,000
Total.....	6,000,000

Walla-Walla, Wallula, and Umatilla are outside the boundaries of the Territory; but a great portion of the Idaho treasure finds an outlet through these places to Portland. The bullion from these points, together with that from Lewiston, making altogether some \$1,790,000, is included in the express and private shipments from Portland.

The decline in the production of Idaho is due to the exhaustion of the creek and gulch claims of the older placer-mining districts of the Boise Basin. The greater portion of these claims have been turned over to Chinamen, who are content with small earnings, and who will maintain, no doubt, for many years to come, a moderately productive industry in these abandoned fields. Many experienced miners express the opinion that the ground in creeks and gulches which has been worked over already has since accumulated a second crop, as it were, of gold. This is doubtless true of certain peculiarly situated localities; but such a rapid regeneration of mining ground cannot be predicated on a large scale. As Mr. Atlee remarks, however, in a letter to me on this subject, many patches of auriferous earth and gravel, rich in gold, were passed over undisturbed by the early miners; millions of cubic yards of sur-

* It will be observed that the estimate of \$8,000,000 for 1869, credited to Mr. Atlee, on page 234 of my last report, was reduced by me to \$7,000,000. Certain items in that estimate were assumed, and I therefore took the liberty of altering the total. The present estimate is carried out in greater detail; and I accept it as the best possible.

OREGON

Location	Name of mill	When erected	No. stamps		Power	Cost	Gold or silver	Present occupants
			No. stamps	No. arrastras				
Baker County								
Auburn	White & Co	....	...	1.	.....	.....	Gold	E. M. White & Co.
Baker City	Ruckles's *	1864	10	..	Water	\$6,000	do	Brown & Virtue
Rye Valley	Green's	1870	...	1	.....	.....	Silver	Charles Green
Grant County								
Prairie Diggings!	Prairie Diggings	1868	8	1	Water	20,000	Gold	Lacock & Co.
Jackson County**								
Applegate	Steamboat	1860	4	3	water	8,000	Gold	Fowler & Co
Dardanelles	Occidental	1866	10	2	steam	1,200	do	Hogan & Co
Jackson Creek	Hopkins	1860	5	1	do	8,000	do	Hopkins & Co
Jackson Creek	Johnsons	1862	..	2	water	4,000	do	Johnson & Co
Rogue River	Jewetts	1861	5	..	steam	10,000	do	Byba & Co
Terling	Ives's	1865	...	1	horse	500	do	Porter Ives
Thompson Creek	Thompson Creek	1865	...	4	water	1,500	do	Morris & Co
-Josephine Co.								
Enterprise	Enterprise	1805	10	2	Water	18,000	Gold	***Cohen
Union County								
Eagle Creek	Eagle	....					
Hoquim	Carter & Davis	1865	5	1	Water	8,000	Gold	Meacham Bros. & Co
Kooster	La Grande	1866	5	..	do	8,000	....	La Grande Co.

* The census reports Ruckles's mill to have 12 stamps, and unless the number of stamps has been decreased since 1869, when I visited the locality, this is the correct number.

† According to the census the Prairie Diggings mill has now 10 stamps; the same authority mentions another mill in this county, which must have been erected during 1870, viz, that of the John Day Co., 8 stamps.

** When I visited the county in 1869, Hopkins's and Jewett's mills were both altered into sawmills.

