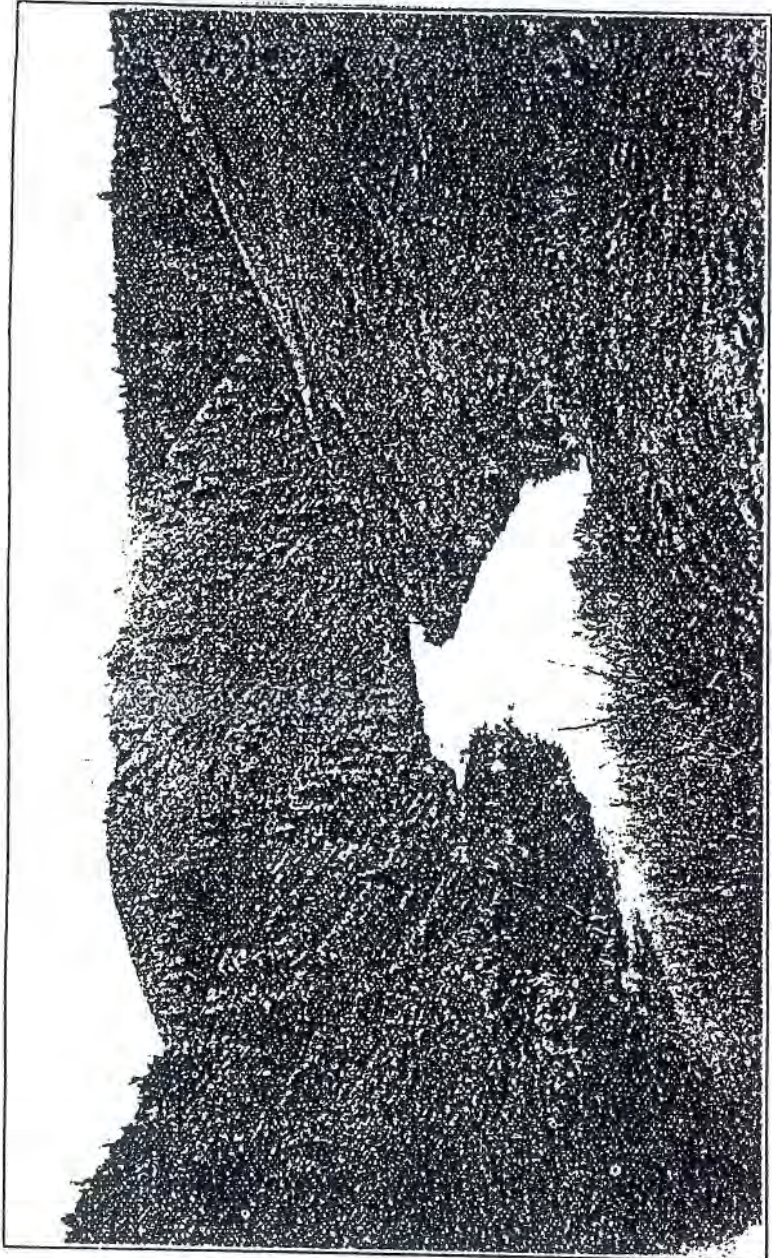


Booker, H.C., Mineral & Allied Resources of Albany County - 1906



ALBANY COUNTY, WYOMING

Albany County, Wyoming.

Albany County is situated in the southeastern portion of Wyoming, and has an area of 3,248,680 acres. Of this, 1,077,754 acres (1905) are listed for taxation. Total valuation of the county, \$4,585,500.77; total tax levy, county and state, 20 mills. Mean elevation, 6,500 feet. Agriculture, stock raising and mining are the principal industries, and the diversified area of mountain and plain, with abundant water supply of the Big and Little Laramie Rivers and their branches, together with a climate second to none, combine to make this a most favored land.

Albany County is in the Cheyenne United States land office district.

Two million acres of land are open to settlement under the land and mining laws of the United States and in the forest reserves, which are open to location under the mining laws of the United States and from which timber can be obtained.

THE CITY OF LARAMIE.

Laramie is the second city of the state, and lies at the base of the western slope of the Laramie Hills, on the east side of the great Laramie Plains. Its altitude is 7,140 feet; population (census of 1900) is 8,207. Here is located the University of Wyoming; the public school system is of the very best, and there are eight churches. Among the manufacturing cities of the state, Laramie takes first place. Here the Union Pacific railroad operates large shops, rolling mills and the tie preserving plant.

Laramie is substantially built, has good hotels and business houses, where the immense trade of the surrounding country is handled, and merchandise stocks second to none in the west are carried, so that all wants are promptly supplied.

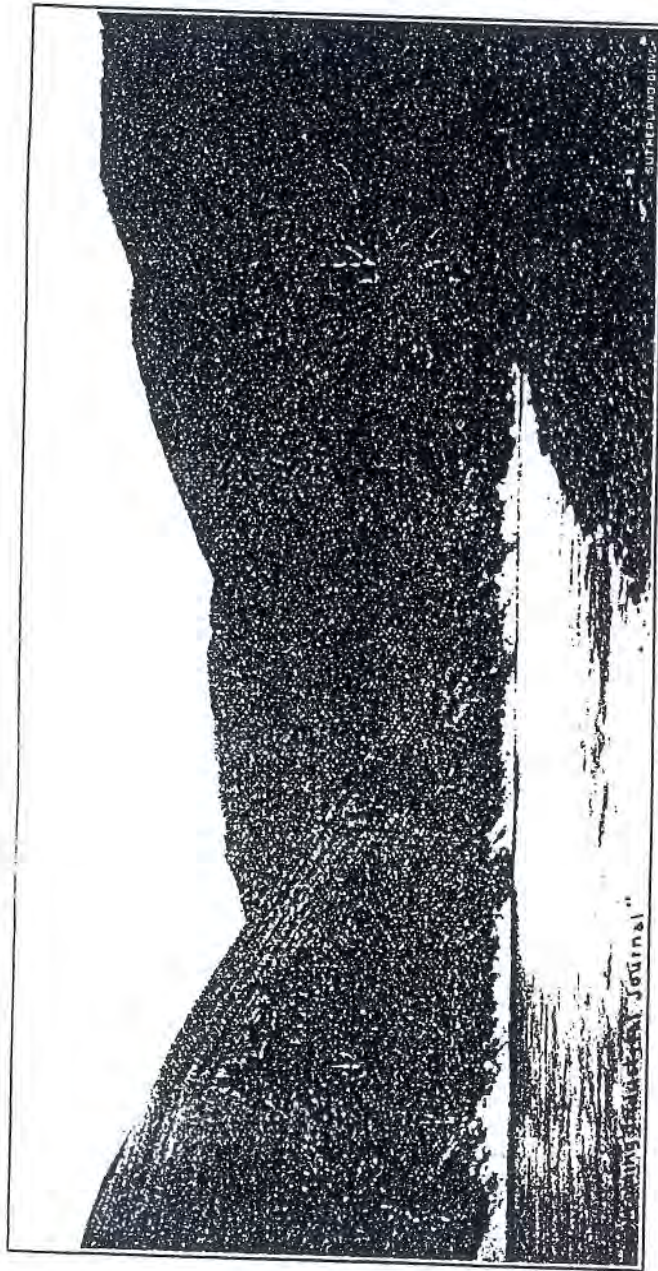


FIG. LARAMIE RANGE NEAR WOOD'S LANDING, ALBANY COUNTY, WYOMING.

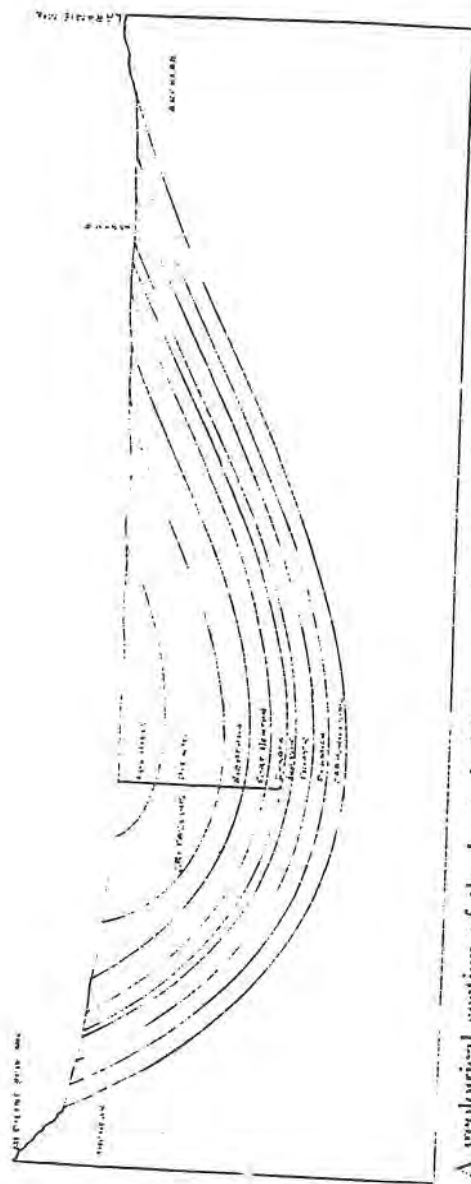
GENERAL GEOLOGY OF ALBANY COUNTY.

To be brief, Albany County may be described as a broad basin forming the Laramie Plains, bounded on the eastern side by the Laramie Hills uplift and on the western side by the uplifts of the Medicine Bow range of mountains. The longer axes of both of these mountain ranges and the trough of this great basin or sinclinal fold is from southeast to northwest, in common with the general direction of the entire Rocky Mountain chain.

On the easterly side of this grand valley or basin is a range of mountains known as the Laramie Hills, or Laramie Mountains, sometimes called the "Black Hills" in the early writings concerning this locality. This chain of mountains lies east of the main line of ranges which form the great Rocky Mountain Chain of North America and extends from a point near the Colorado-Wyoming state line in a general direction west of north along the Albany-Laramie County line to a point in the northeastern corner of Albany County at Laramie Peak, whence this range turns north of west and again passes into the high table lands and smaller hills of Central Wyoming, Laramie Peak being the highest and turning point of this entire uplift, having an altitude of 11,000 feet; the general altitude of the range varies from 7,000 feet to 9,000 feet above sea level.

This Laramie Range consists essentially of a huge core of archaic granites extending throughout the entire length of the range and flanked on either side by the later sedimentary formations which slope at a varying angle away from the main central uplift, showing the Cambrian shales and Carboniferous limestones immediately overlying the granite. These are succeeded by the red beds of the Triassic, the clays, limestones and marls of the Jurassic, and the sandstones, clays and shales of the Cretaceous to the Tertiary clays and other later formations occurring north of the range in the main Platte Valley. These latter, however, will not be discussed in this paper, as the Laramie Plains consist essentially of the upper Cretaceous formations, and the only Tertiary deposits are small isolated islands occurring near the northern limits of this county and are not important.

These formations and their general relation to the mountains on which they lie are shown in the accompanying section, by the late Prof. W. C. Knight of the University of Wyoming, across the Laramie Basin, but at different points in the Laramie Plains region in eastern Carbon County and western Albany County there are a number of smaller uplifts, where the underlying formations have been brought to the surface in a limited area, causing a local change of dip of these formations. Where these are commercially important they will be discussed later in this paper.



A geological section of the Laramie Plains, extending from the Laramie Mountains westward through Laramie to the Medicine Bow Mountains. [Drawn to scale.]

By Prof. W. C. Knight, University of Wyoming.

The Medicine Bow Mountains, on the western side of the basin and in the southwestern corner of the county, are the result of a series of uplifts occurring at various times along the length of the range, the main uplift forming the present backbone or crest of these mountains, and extends in a northwesterly and southeasterly direction.

In connection with this main range are a number of smaller and evidently later uplifts known as Jelm Mountain and Sheep Mountain on the south and Cooper Hill and Elk Mountain on the northerly end, these latter mountains lying in Carbon County, Jelm Mountain and Sheep Mountain are evidently uplifts similar to the eastern range, or Laramie Hills uplift, and show a similar red granite as a core with the sedimentary formations lying thereon on either side of the mountain, and appearing again on the western side of the Centennial Valley lying on the eastern slope of the Medicine Bow Mountains.

The Medicine Bow Range shows these same red granites in many places, and with them are associated gray granites, schists and similar rocks. These form the ranges proper, but near the central portion of the range in Wyoming occur what is known as Snowy Range, forming the highest point of the Medicine Bow Range. Here the formation consists of quartzites, trachytes, porphyries and similar rocks, the whole range affording an intensely interesting field of study for the economic geologist.

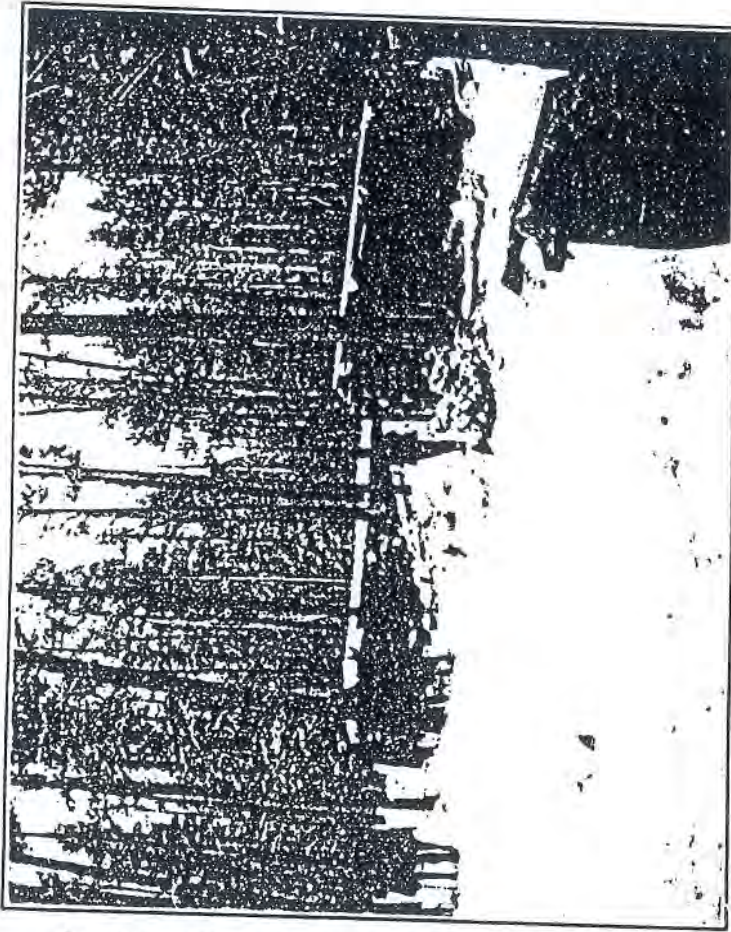
These ranges extend south into Colorado, and there is a great deal of the territory included in these and adjacent ranges which are naturally tributary to the Laramie Basin region, and where conditions similar to those here described will be found, on investigation, to obtain at these points.

West of the Medicine Bow Range is the broad valley of the North Platte River, and west of the river lie the Sierra Madre Mountains in southern Carbon County, where the famous Ferris-Haggarty and Doane-Rambler mines are located, and, with the ranges of the Medicine Bow Mountains are popularly known as the Grand Encampment Copper District, which together form the principal copper producing localities of Southern Wyoming. These regions are covered by a bulletin by the State Geologist, copies of which may be had by applying to the Geologist at Cheyenne.

MINING IN THE MEDICINE BOW MOUNTAINS.

Mining in this region has been carried on since the first Spanish explorers worked their way northward along the Rocky Mountain Range from their landing places on the Mexican coast, as traces of these ancient workings have been found, together with old tools, weapons and other articles indicating the presence

of these the earliest pioneers. These ancient workings are supplemented by others dating from the first emigrant train across the old Julesburg-Pass Creek-California trail. These prospectors were either killed or periodically run out by the Indians for many years, even after the Union Pacific railroad was built through in 1867.

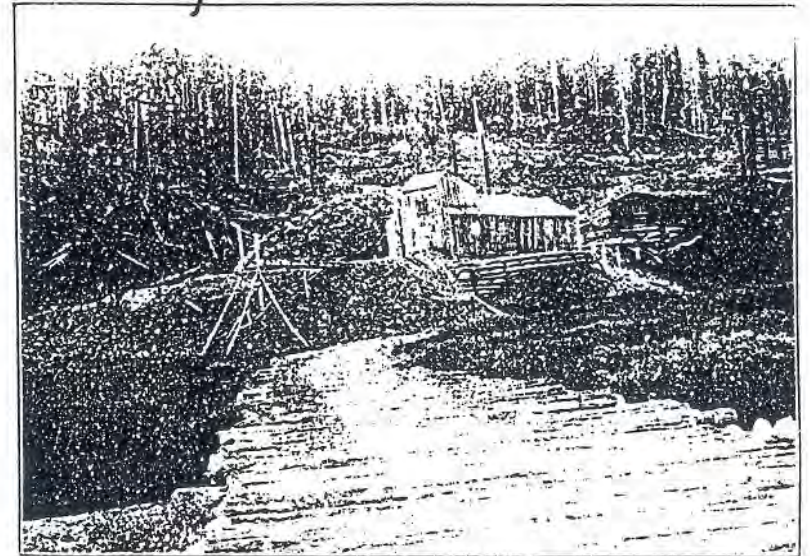


JARAVIE, HAYDEN'S PEAK AND PACIFIC RAILWAY THE CAMP.

In 1868 gold was discovered in Moore's Gulch, a small tributary of Douglas Creek, and while there is some evidence that gulch mining has been carried on in the lower tributaries of Douglas Creek at much earlier periods, this is the first well authenticated discovery of pay values in what is now known as

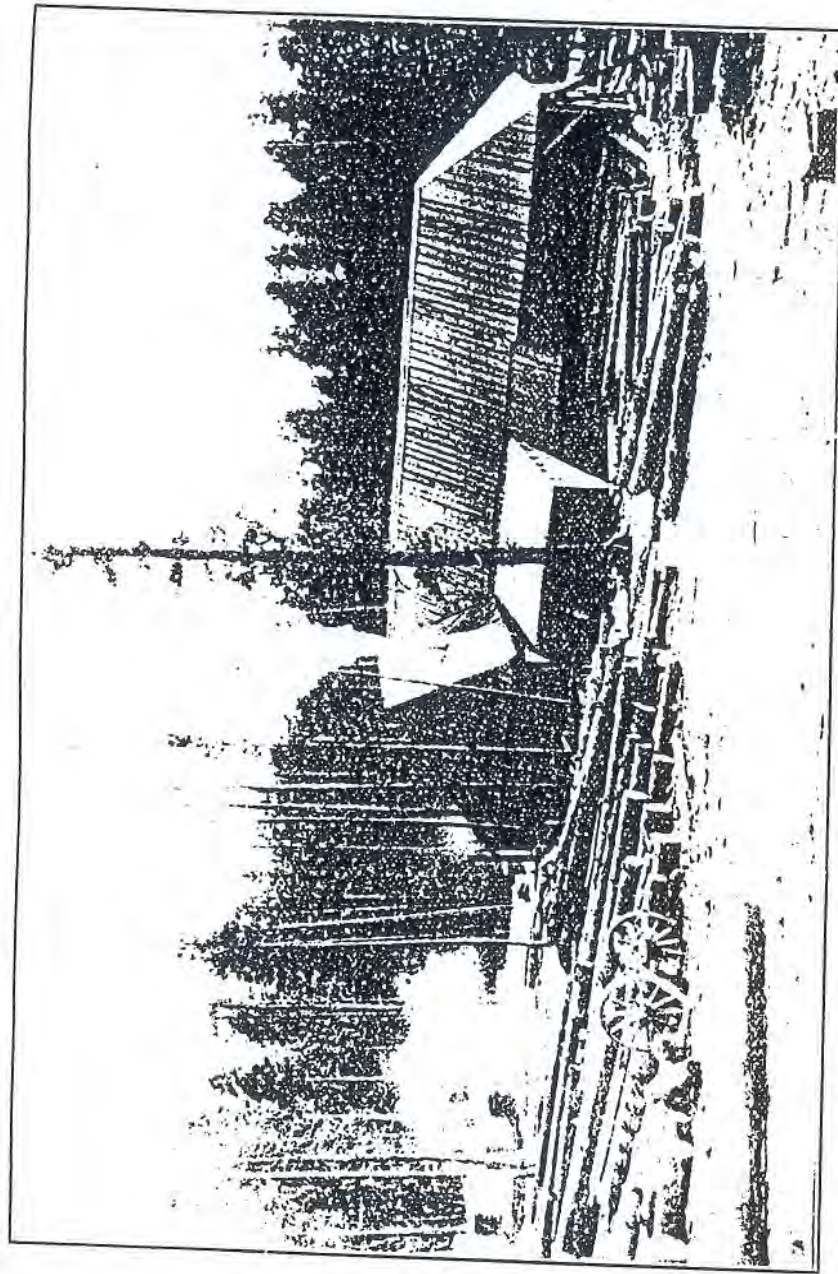
Medicine Bow Mountains, though Hayden in his "Report of the Territories, 1867-8-9," says that "valuable specimens of ores and placer gold" had been brought to him from the mountains southeast of Fort Fred Steele, and known at that time as Elk Mountain and Medicine Bow Mountains, but there is no record of any prominent or permanent discovery made at this time.

Following the discovery of gold in Moore's Gulch, placer mining became very active and continued for a number of years, some of the gulches being worked for many years by crude methods and produced a great deal of gold, but there is no present way of determining the total amount produced.



THE DOUGLAS MINE-A. E. MILLER

The first lode claim located in Albany County of which there is any authentic record was the Morning Star claim, now known as the Douglas mine on Douglas Creek, which was made in 1870, and since that time lode mining has continued with frequent activities in the different camps of the district, notably at Centennial, where the Centennial mine was opened up in 1876; the Keystone at Keystone in 1878; the Cummins camp at Idem in 1879, leading up to the discovery of copper in the great Rambler mine in 1900, and since that time mining in the Medicine Bow has become a permanent and profitable fact.



BOSTON AND WYOMING LUMBER COMPANY'S SAW MILL, CENTENNIAL, WYO.

THE MEDICINE BOW PLACER DISTRICTS.

It is not too much to say that every stream which heads on the eastern slope of the Medicine Bow Mountains in Wyoming contains placer gold, and that nearly every gulch on this slope will yield some return to the prospector with shovel, pick and pan. Neither is it too much to say that every gulch and stream in this locality has been tested in this manner and a number of streams, especially Douglas Creek and its tributaries, have been found to carry the yellow metal in commercial or paying quantities.

To the early prospector, whose outfit consisted of a couple of burros, a pick, shovel and gold pan, a little gravel and a blunder, pay dirt means only gravel easy to get at, easy to pan and with a sufficient number of large nuggets to enable him to make a day's pay whenever he came on a stream. The man who followed him considered as pay dirt any gravel which warranted the quick building of rough board sluices and riffles, with the additional facilities of a small ditch which could be constructed before the washing season allowed active work in the creek beds. Placer enterprises of this sort are necessarily few and short lived, and they were followed by the company which constructed larger and longer ditches than their individual predecessors, and installed a giant, with long ditches, and flumes at the base of the pit with a string of riffles long enough to catch any stray particles of gold that might otherwise escape.

The next step in the hydraulic history of a camp is the installation of numerous mining devices by associations of owners which endeavor to work the ground "worked out" by the gold pan and small ground sluice methods by sundry and various patent "processes" and "machines" guaranteed by the inventor to be the only thing ever really accomplished by the miner and which usually stands as a melancholy monument to misdirected energy among the willows, and a too blind faith in the works of man.

The Medicine Bow placer districts have passed through all of these stages and now are again coming to the front as a field for intelligent enterprise, backed by sufficient capital for commercial operations, and under careful direction will certainly show profitable returns. The presence of gold in these creek bottoms has never been doubted or denied. Every placer enterprise that has ever been conducted in these mountains has shown the presence of gold in the lands worked, and some of the enterprises have been conducted profitably to the extent of their capital and commitment, ceasing to work when they reached a point where they could not make it a success with the means at hand.

The Eastern Medicine Bow Water Shed.

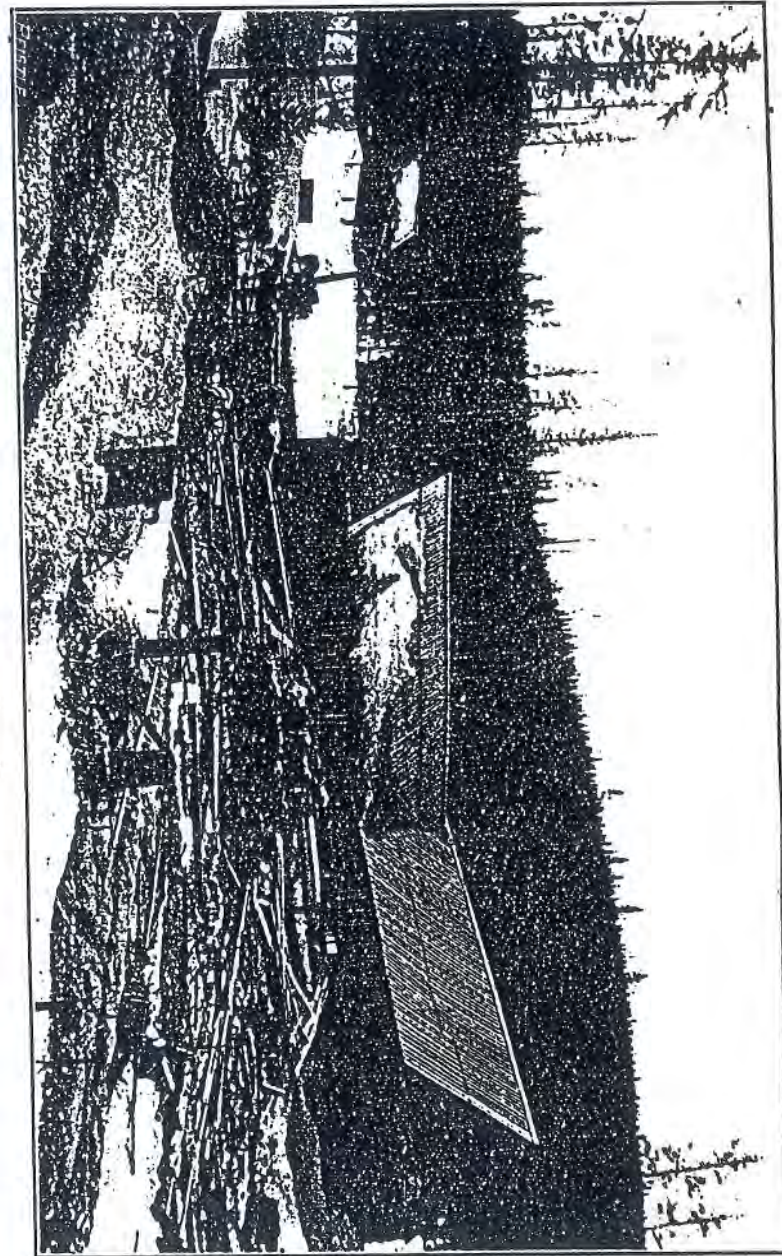
This would practically include every stream which heads on the eastern slope of the Medicine Bow range of mountains, and without burdening the reader (for the present) with a catalogue of the small creeks of the region, these may be classed as the tributaries of the Medicine Bow River at the north end of the mountains, the tributaries of the Little Laramie River at Centennial and the central part of the region, and those of the Big Laramie River at the southern end of the county in the Helm Mountain vicinity. Add to these the tributaries of Douglas Creek, which rises on the southeastern slope of the Snowy Range, flows in a southerly course to within six miles of the Wyoming-Colorado line, then turns abruptly west and flows into the North Platte River in Carbon County. This creek, with its tributaries, drains the southwestern slope of the Medicine Bow Range, and on this creek and its tributaries are found the principal gold-producing gravels which are noted in this section of Albany County.

Numerous placer workings are also found at the head of Pass Creek on the north; Brush Creek and French Creek, which head on the western slope of the same vicinity as Douglas Creek, and to a lesser extent in South French Creek and Mullen Creek, and in outline these rivers, creeks and their tributaries may be said to cover the water shed of the Medicine Bow Range in Wyoming.

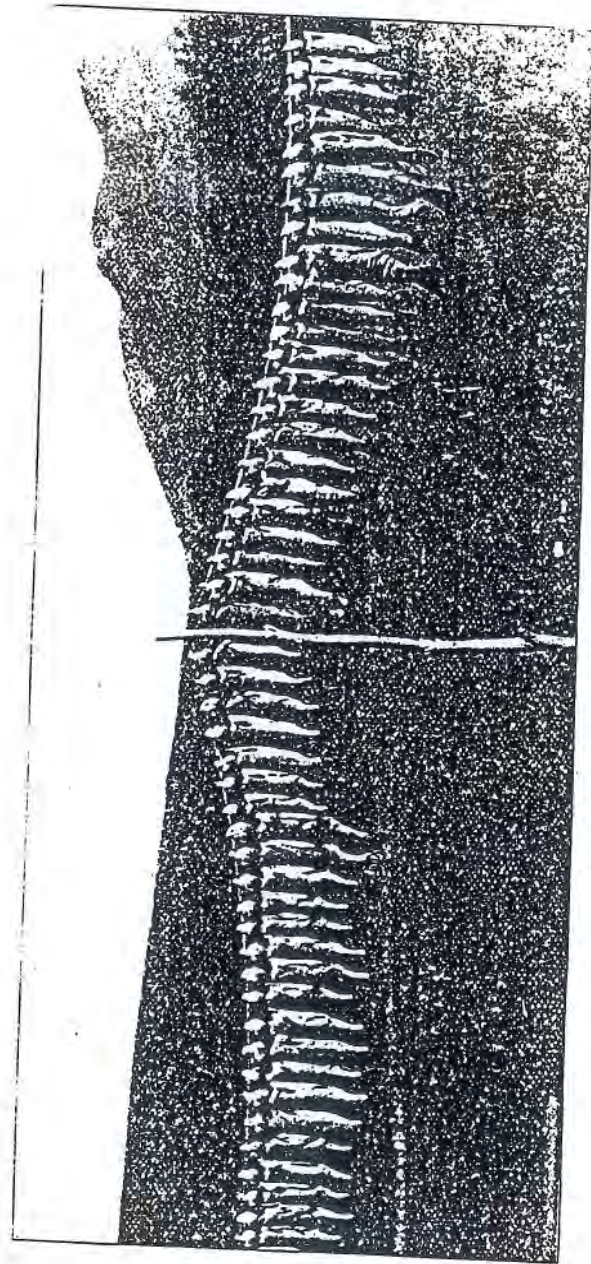
The Douglas Creek Placer Mines.

These include all the placers which may be found on Douglas Creek and its tributaries. Gold was first discovered in this district by Iram M. Moore in what is now known as Moore's Gulch, one of the tributaries of Douglas Creek, in the fall of 1868. The district was then organized and called Douglas placer district, Mr. Moore being elected its first president and Captain John Metcalf its first recorder. The principal work was done in this district in 1869, and, though nothing but the ordinary sluice box, rocker, long tom and gold pan were used, about \$8,000 worth of gold was taken out of this gulch in that spring. It is given on good authority that many washings yielded from \$2 to \$2.50 to the pan and many nuggets were found weighing from 5 to 20 dwts.

Douglas Creek proper is about thirty miles in length, and the greater portion of its length has been located for placer, together with its most important tributaries, which are Lake Creek, Muddy Spring, Keystone, Beaver Gulch, Horse, Gold Run, Joe's Creek, Moore's Gulch, Dave's Creek, Ruth's, Elk, Bear and Willow Creeks. The district may be stated to embrace an area fifteen miles long and ten miles wide, and lies forty-five miles due west from Laramie.



SAW MILL—MEDICINE BOW RANGE



A CROSS SECTION OF THE BIG LARAMIE.

The Douglas Creek flats vary in width from 50 to 1,000 feet. Operations may be carried on in this district for six or seven months in the year, the working season beginning about the middle of April and closing about the middle of November. The water varies in each creek, but may be given as running from 6,000 miners' inches during high water in the spring down to 1,500 miners' inches at low water in August and September in main Douglas Creek, and the general fall of these creeks varies from 20 feet to 125 feet to the mile.

Those who are best informed on the actual working conditions of these creeks state that about 25 per cent of gold in this district is coarse and that a few of the nuggets taken out have considerable quartz attached to them. Nuggets have been taken out in the different portions of the district that weighed from 16 to 68 dwts. each, but the majority of the gold is in shape of finer particles varying from the fine or flour gold up to flat nuggets an eighth of an inch long. The greater portion of the gold is found deposited on the bed rock, which varies in different portions of the district, but it is generally of a granitic nature and usually shows considerably decomposed or weathered. The auriferous gravel beds are from three to fifteen feet in thickness, averaging about five feet. There is no pipe clay or hard cement to interfere with the successful washing of the gold, unless in a few small deposits noted locally in some places. The gravel and wash consists of the decomposed, broken and washed detritus of the surrounding hills, and the formations consist principally of granite, diorite, schist, quartzite and slate, the boulders varying of course in each locality, with the usual amount of quartz, sand and black sand, the latter resulting from the crushing of the black oxides of iron which occur in many of the formations of this locality.

Platinum has been found in a number of these placers, usually associated with the black sand and metallic platinum in a number of instances.

The Douglas Consolidated Placers.

The principal company operating in this vicinity is the Douglas Consolidated Mining and Milling Company, which was organized in 1892 under the laws of the State of Wyoming with a capital stock of \$2,000,000 in shares of \$1 each. The principal office of the company is in Laramie and the officers are—

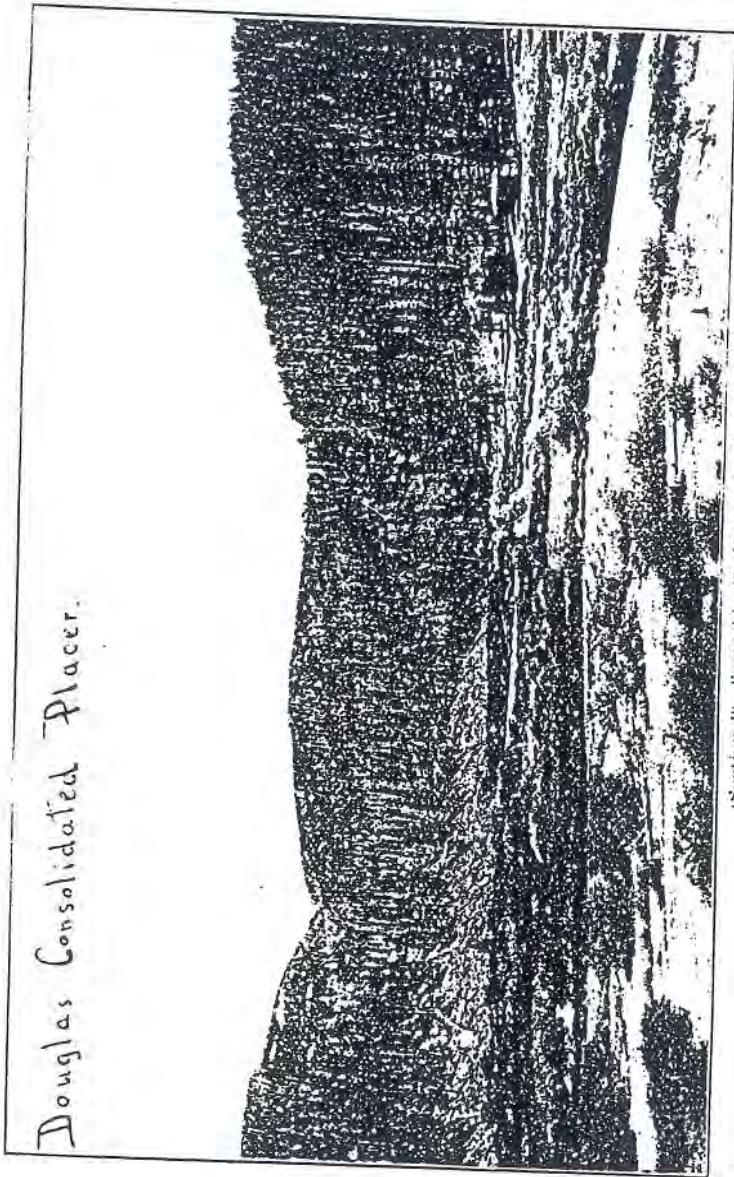
M. N. Grant, President and General Manager.

M. E. Richie, Vice President.

H. D. Beemer, Treasurer; and

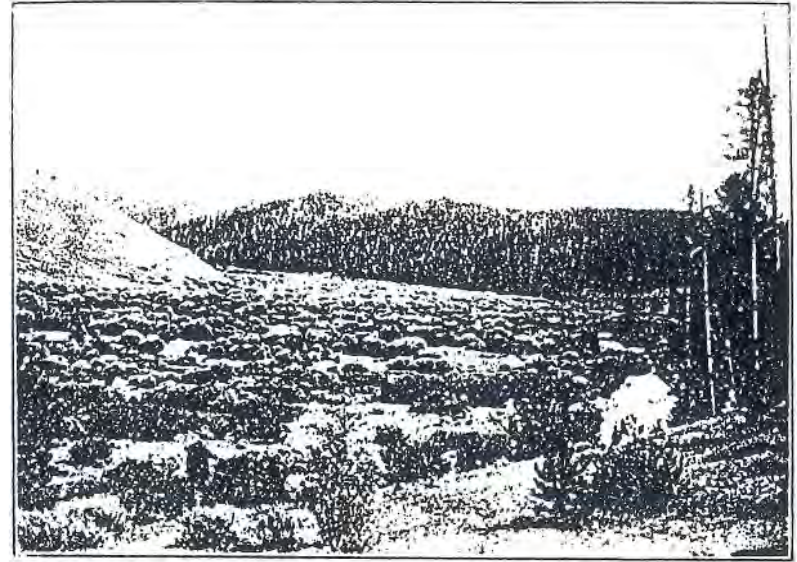
N. E. Corthell, Secretary.

All are residents of Laramie.

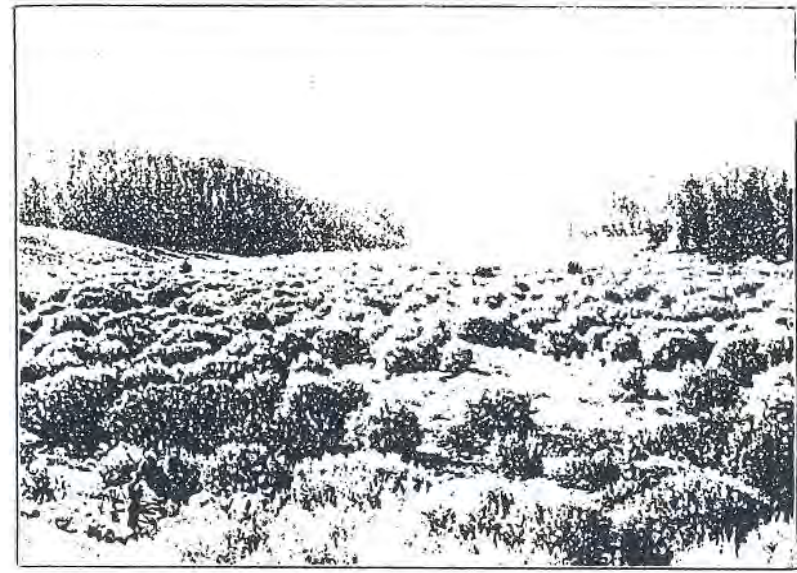


Douglas Consolidated Placer.

(Section 18, Township 13, Range 20 West.)



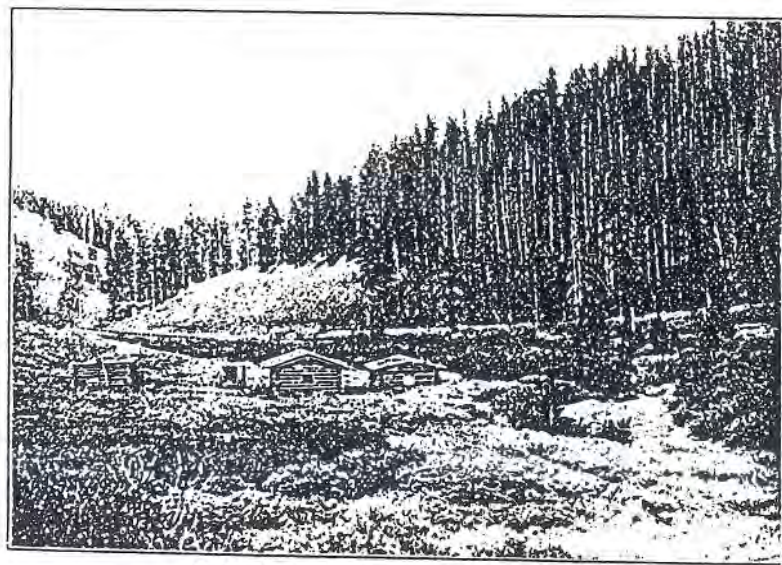
DOUGLAS CONSOLIDATED PLACER
(Sections 19, 20, 29 and 30, Township 13, Range 20 West.)



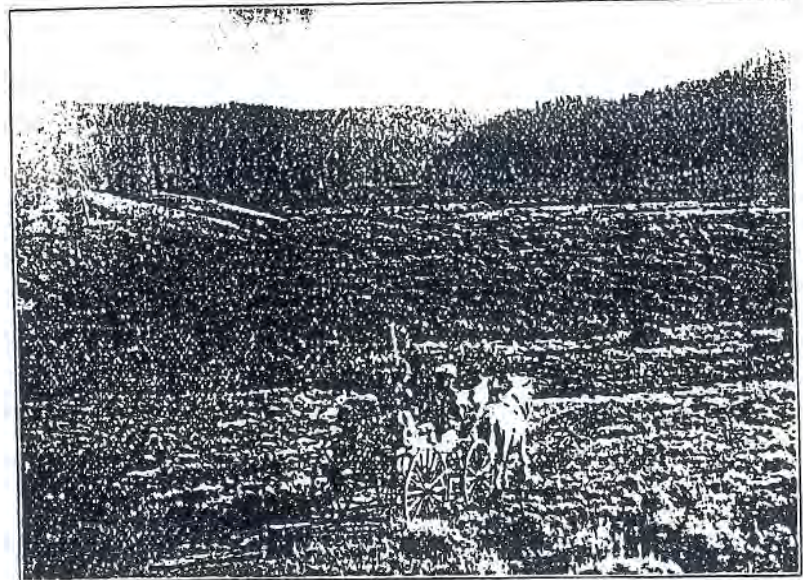
DOUGLAS CONSOLIDATED PLACER
(Sections 20 and 29, Township 13, Range 20 West.)



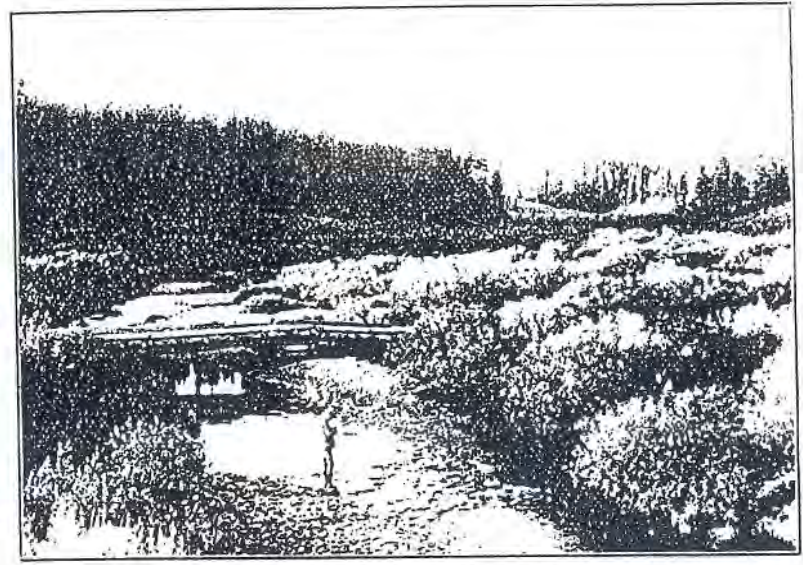
DOUGLAS CONSOLIDATED PLACER.
(Section 16, Township 13, Range 79 West.)



DOUGLAS CONSOLIDATED PLACER.
(Sections 15 and 16, Township 13, Range 79 West.)



DOUGLAS CONSOLIDATED PLACER.
(Sections 10 and 11, Township 13, Range 79 West.)

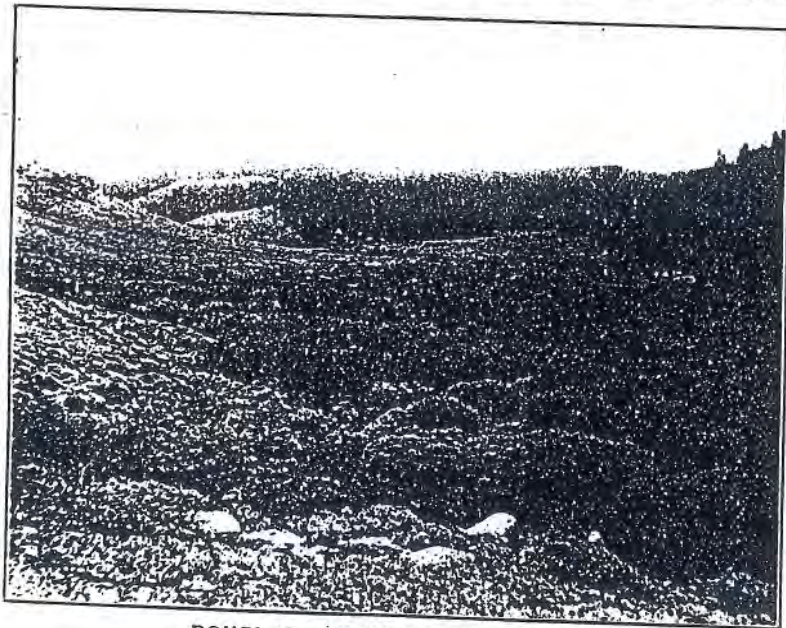


DOUGLAS CONSOLIDATED PLACER.
(Sections 10 and 11, Township 13, Range 79 West.)

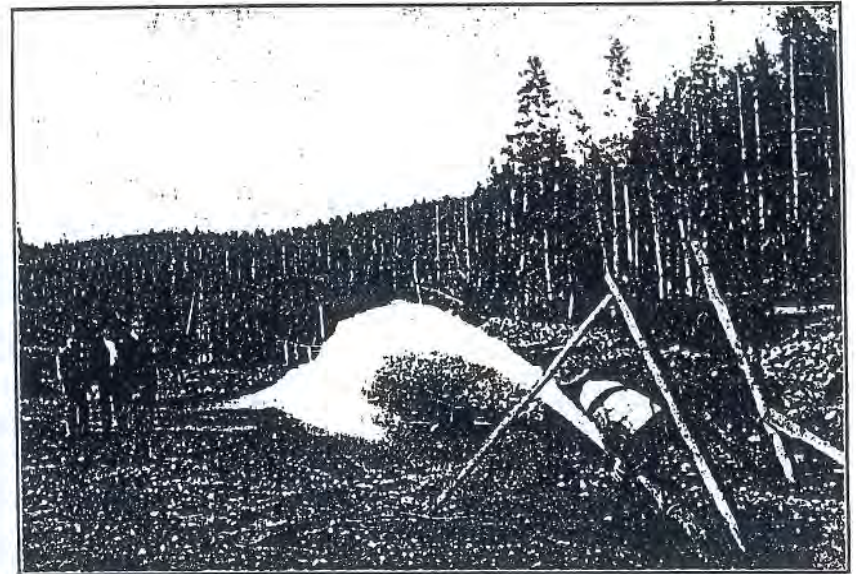
The average depth of the gravel on Muddy Creek is four feet; the fall is from 20 feet to 120 feet to the mile, and the water supply runs from 1,500 miners' inches during high water to about 100 inches in the fall months. Considerable ditch work has been done on this property, two ditches having been constructed on Muddy Creek, one completed for a distance of 3,000 feet and projected for a distance of one and one-half miles to the mouth of the creek for hydraulic purposes. The other ditch has been completed for 1,800 feet. These ditches are three feet wide on the bottom, eighteen inches deep, with a fall of ten feet to the mile, and at their terminal points give a head of 135 feet.

As before stated, tests of this ground have shown that about 25 per cent of the gold is coarse, but all of it is heavy and easy to amalgamate. Hon. M. N. Grant of Laramie, who is perhaps the best posted man in Southern Wyoming on these placers, states that this gravel will average 35 cents to the cubic yard, and furnishes the following memorandum of tests made by himself and others on the placer ground of this company, which is given verbatim:

"In section 10, township 13, range 70, where pan tests were made, 100 pans were figured to the cubic yard and the gravel figured to be six feet deep. Pan test in ditch 160 feet in length,



DOUGLAS CONSOLIDATED PLACER.
(Mouth of Lake Creek.)



DOUGLAS CONSOLIDATED PLACER.
(Muddy Creek.)

made by M. N. Grant, gave 90 cents to the cubic yard. Pan test made by D. E. Roe of Denver, Colo., in the same ditch, gave \$1.75 per cubic yard. Two other pan tests, made by other parties, gave over \$1 per cubic yard. After this, and in the same ditch, M. N. Grant ran through boxes ten square yards of gravel on bed rock, taking four to six inches of gravel on bed rock, and not running through any of the gravel above this. He saved 70 cents to the square yard. The gravel in the ditch would average five feet deep. This ditch is on rim rock and about two feet above true bed rock.

"In section 15, township 14, range 70: Tests made in ditch 150 feet in length gave 92½ cents to the cubic yard. The gravel at this point was five feet in depth and was figured on the basis of six feet. Nine hundred feet above this, in the same section, the cross-cut ditch thirty feet in length gave \$1.05 to the cubic yard—gravel six feet deep. Above this, in the same section, a pit five by ten feet gave 95 cents to the cubic yard.

"In section 25, township 14, range 79: Tests made by S. W. Tannehill, in a pit 15 by 48 feet, run through boxes, gave \$1.25 per cubic yard; gravel five feet deep. Above this, in the same section, tests made by M. N. Grant, in pit 30 by 30 feet, gave 49

cents to the cubic yard; and a pit 20 by 20 feet gave 60 cents to the cubic yard; and a pit 40 by 160 feet gave 40 cents to the cubic yard, all run through boxes. Four tests above show an average of 68½ cents to the cubic yard.

"The average tests made on Douglas Creek by M. N. Grant show 83½ cents to the cubic yard, and it is his belief that all of the ground will average not less than 35 cents to the cubic yard. One sample of this gold sent to the U. S. mint at Denver, Colo., from Douglas Creek was .940 fine. Two from Muddy Creek were one .911 and one .911½ fine; and one from Lincoln Gulch .950 fine. This sample showed platinum."

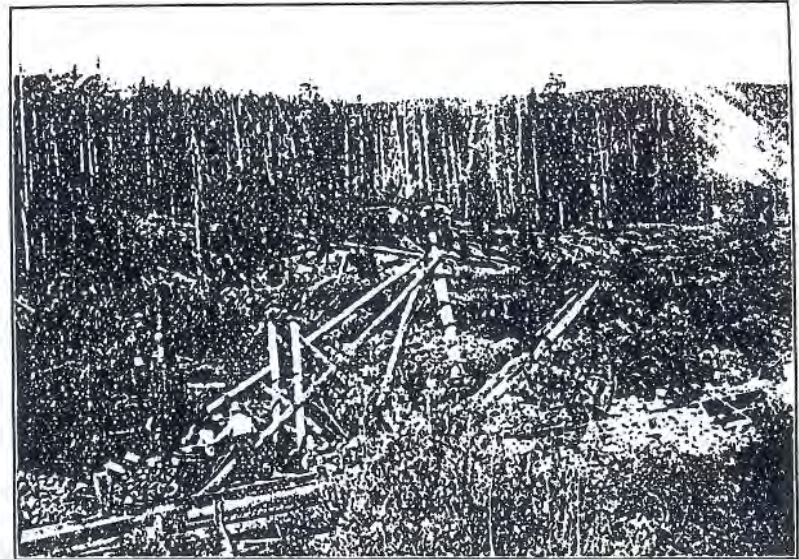
A number of flats of this company's ground, which are shown in the photographs illustrating this pamphlet, are adapted for dredging operations, and it is suggested that this method of working and extraction be given all due and careful consideration in these and a number of the other properties described in this book.



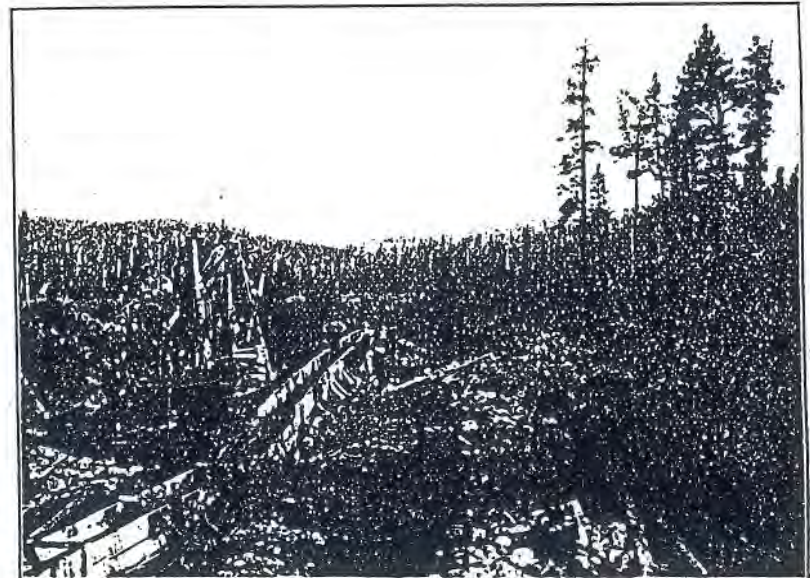
THE HOME PLACER—OTTO GRAMM.

The Home Placers.

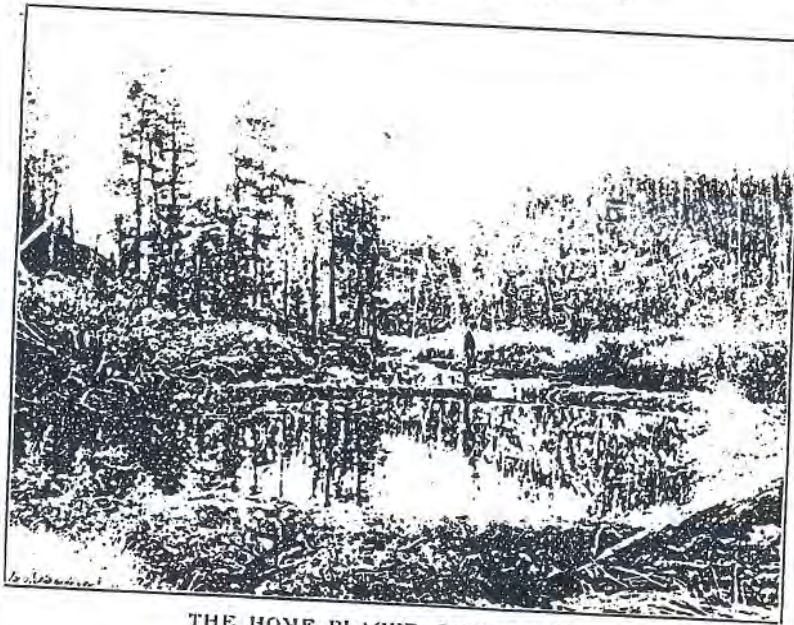
Above the property just described, on Douglas Creek, is situated what is known as the "Home Placers," which include the Home, Fay and Minnehaha placers, which extend up Douglas Creek from section 34 to section 10, township 14 north, range



THE HOME PLACER—OTTO GRAMM.



THE HOME PLACER—OTTO GRAMM.



THE HOME PLACER--OTTO GRAMM.

79 west, and on Beaver Creek to a point on section —, township 14 north, range 79 west, comprising about 359 acres of land owned by Hon. Otto Gramm of Laramie. It was on the Home placer that the largest nugget yet found in the Douglas Creek district was discovered; weight, 68 dwts. These placers present a varied condition of canon and flats, the lower part being a deep canon from 80 to 200 feet wide, which widens out to a large flat below the mouth of Beaver Creek and again becomes a canon between Beaver Creek and Keystone, where the Keystone mine is situated. At the lower end of the flat this season the Pioneer Placer Mining Company put in a small steam shovel and did a considerable amount of experimental work, which showed an average of 50 cents per yard handled. Dredging would be the proper method of handling the gravel of these flats and a rock crane for the large boulders, while sluice boxes and riffles are best adapted for the canon placers. The water here runs about the same as in the Douglas placers below and the fall averages about the same. The bed rock is mostly granite and no difficulty has been experienced in working this ground.

The Albany Placers.

Above the Home placers on Douglas Creek are the Albany placers, owned by the Albany Development Company of Lar-

amie. It consists of 775 acres of patented and 480 acres of located ground, extending up Main Douglas Creek, Moore's Gulch, Elk Creek, Bear Creek and Dave's Creek.

Here the average fall is given at 62 feet per mile on Douglas Creek, 120 feet per mile in Moore's Gulch and from 80 feet per mile up in the smaller gulches of the property.

A test by Hon. M. N. Grant on this gravel showed a value of \$29.45 gold from twenty-five yards of gravel, or \$1.25 per yard.

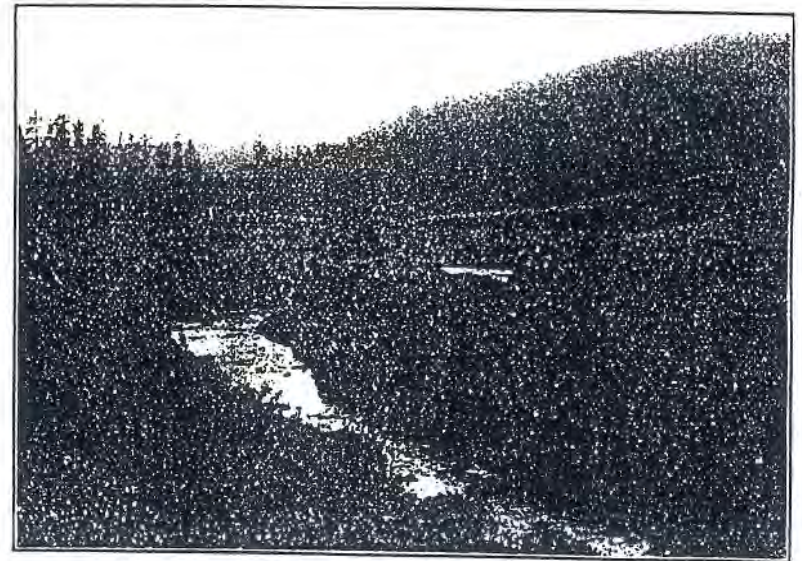
A run on Dave's Gulch gave \$3,500 return from 2,200 yards of gravel, or about \$1.60 per yard.

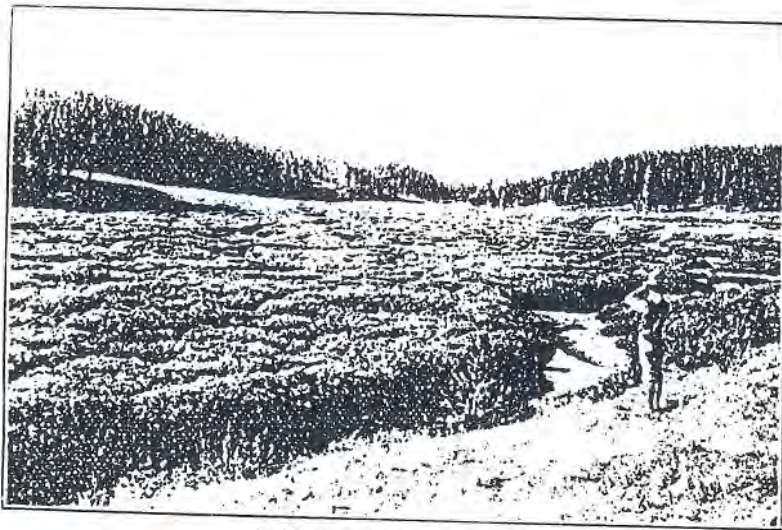
From his numerous tests on the property Mr. Grant estimates the average depth of gravel at six feet and gives a total of over 3,000,000 yards of gravel now available on the property, on which he places a value of 50 cents per yard.

The water rights of this property are said to antedate all others on Douglas Creek by one year, and the supply of water varies here from 1,500 to 4,000 mining inches during the working season.

These placers carry metallic platinum in varying amount, associated with the gold particles and black sand. Palladium is also noted, but the amount per yard cannot be authoritatively given.

This company's property is located in the Medicine Bow Mountains, about forty-five miles west of Laramie, Albany

THE ALBANY PLACERS.
(Section 16, Township 14, Range 79 West.)



THE ALBANY PLACERS.

(Sections 9, 10 and 15, Township 11, Range 70 West.)

County, Wyoming. The Laramie, Hahn's Peak and Pacific Railroad Company's road bed is graded to within about fifteen miles of this property, and the rails are now being laid.

Laramie City is the nearest town located on the Union Pacific railroad, and there is a good wagon road from that point to this property. A daily stage, carrying mail, runs between Laramie and this property.

The following report of M. N. Grant, one of the former owners and operators, gives further information concerning this property:

To the Albany Development Company:

"I beg leave to submit the following report on your property:

"On Douglas Creek (not including the bench land or rim rock) I estimate that pay gravel will average six feet in depth, and that there is at least 3,020,160 cubic yards of gravel that will average not less than 50 cents per cubic yard. On Moore's Gulch there remains about sixty thousand cubic yards of gravel. This gravel will, I think, average over a dollar a cubic yard.

"In 1869-70 a portion of this ground was partly worked over from a point where the creek enters Douglas Creek bottom and up Moore's Gulch for about 400 yards, and about 4,000 cubic yards of gravel was removed by the use of sluice boxes, rockers and gold pans. By this crude method there was obtained about \$0,000 in gold. In many places on bed rock, the gravel would pan

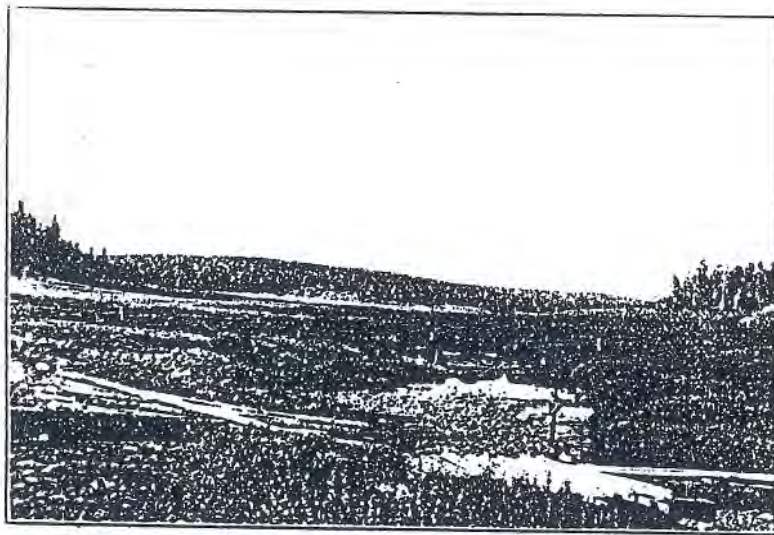
from 50 cents to \$2.50 per pan, and many nuggets were taken out weighing from one to twenty pennyweights.

"On Dave's Creek there remains about 70,000 cubic yards of gravel. Where this creek enters Douglas Creek bottom and up the creek for about 500 feet the gravel was worked in the

THE ALBANY PLACERS.
(Dave's Gulch.)

same way as that on Moore's Gulch, about 2,200 cubic yards being worked, out of which there was taken about \$3,500.

"In 1896 Charles Culross and I made a test on the bench land or rim rock between this creek and Douglas Creek. We ran twenty-five cubic yards of gravel through sluice boxes, and cleaned up 31 pennyweights of gold of the value of \$29.45. In



THE ALBANY PLACERS.

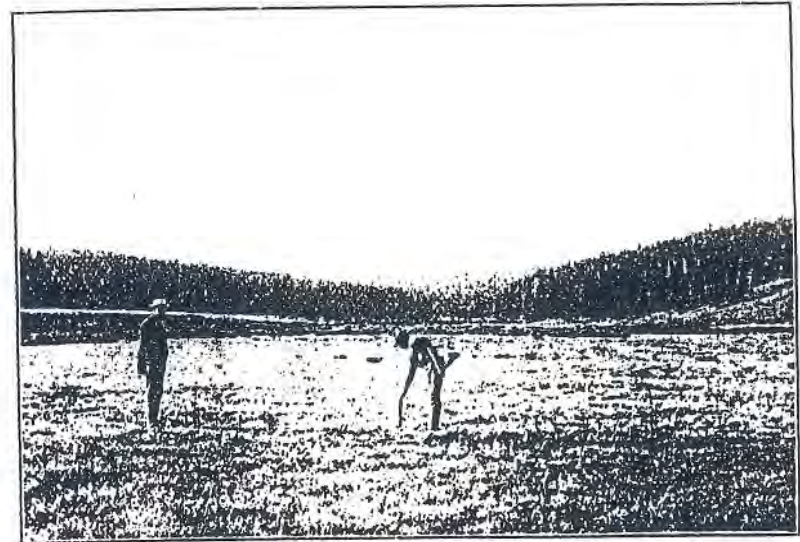
(Sections 2 and 10, Township 14, Range 79 West.)

the black sand we found about \$5 or \$6 worth of platinum. On Elk Creek and Bear Gulch there is about 250,000 cubic yards of gravel.

"The Rambler copper mine is located within a few hundred feet of Bear Gulch. The ore in this mine carries platinum and palladium. I have made but few tests on this part of the property, and am unable to state what the gravel will average, but from what information I have, I believe it will average the same as the ground on Douglas Creek.

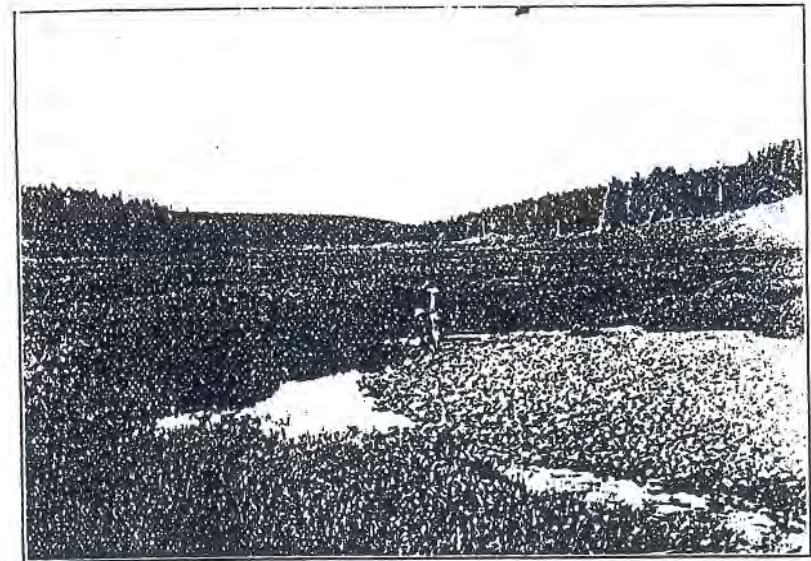
"The water in these creeks will vary some in the different years. On Douglas Creek there is about 1,500 miners' inches in low water, to about 4,000 in high water, with a fall to the creek of 40 to 70 feet to the mile. On Elk Creek there is from 500 to 1,500 miners' inches, and Dave's Gulch and Moore's Gulch, 50 to 500 miners' inches of water. The working season is from five to six months a year.

"There is plenty of pine timber, good for lumber and fuel. The gravel beds are free from timber, but are partly covered with small willow brush. The gravel beds were apparently formed by glacial action, there being many boulders found in the deposit unlike any formation through which these creeks flow. The gold is from .1000 to .050 fine, and generally bright and easy to amalgamate. There are but few boulders that will weigh over 500 pounds.



THE ALBANY PLACERS.

(Section 3, Township 14, Range 79 West.)



THE ALBANY PLACERS.

(Sections 2 and 3, Township 14, Range 79 West.)

"In my judgment, the best and most economical way to work this property is by the use of two steam shovels, which should have a capacity of one and one-fourth yards each. The gravel when dumped into cars can be run by gravity to a hydraulic elevator, then dumped on a grizzler and washed by hydraulic pressure; and the boulders, by the use of a derrick, can be dumped out of the way. The derrick can be operated by water power. By this method nothing but the fine material will be carried into the sluice boxes. The advantage of the hydraulic elevator would be to thoroughly wash the gravel and give elevation, so that under currents could be put in to save the fine gold and concentrate the black sands. These sands are estimated to carry from \$5 to \$25 per ton in gold, the metal being held by oxidized iron; it also contains quite a large per cent of platinum that could be saved. A hydraulic ditch can be constructed at a cost not to exceed \$5,000, I think."

For further information, apply to Louis Tyvold, Secretary, Laramie, Wyo.

The Spring Creek Placers.

The Spring Creek placers are owned by William Sturgis of Cheyenne and others. This property contains 740 acres and extends the entire length of Spring Creek, one of the tributaries of Muddy Creek. The length of this creek is three and one-half miles. The gravel bed or pay streak varies in width from 50 to 150 feet, and has an average fall of 150 feet to the mile, insuring a good dumping ground for the tailings. The depth from grass roots to bed rock is from three to six feet, with an average of four feet. The water from Spring Creek will supply the demand for about forty days in the spring while the snows are melting, after which the water supply is insufficient. To obviate this difficulty, the company has secured a water right on Douglas Creek and propose a ditch from this creek to their property. The length of this ditch will be a little over five miles, and will reach the property 150 feet above the level of Spring Creek, thereby insuring sufficient pressure for hydraulic washing. The property was worked by the owners in the spring of 1895 for about thirty days, while the water lasted. About 1,200 yards of gravel were handled, and the clean-up is said to have given \$1,000. It is asserted that the ground will yield \$1 per cubic yard along the pay streak. The gold is coarse and jagged, but slightly worn from washing, and is almost wholly confined to bed rock. Hon. M. N. Grant states he saw the clean-up for the above run, and out of the \$1,000 there was by actual weight over \$400 in nuggets weighing from 1 to 17 dwts.

Small Placers.

Up and down these creeks, where the big placers are now situated, have been in former years many "small placers," which produced profitably for their several owners, who worked on a limited scale. Many of these have been acquired by the com-



LINCOLN GRIFITH'S HERLEY.

panies and associations just mentioned and now form part of their large holdings.

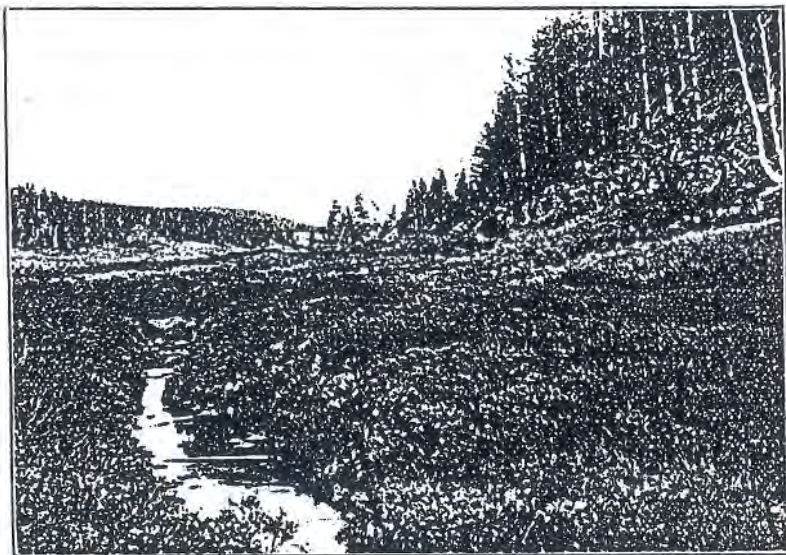
There are, however, a number of these lesser placer works which are interesting and offer inducements to smaller companies or individuals.

Roper & Griffith own 160 acres on Douglas Creek, just above the mouth of Muddy Creek, and have been working

this for years, using only the ordinary sluice box and riffles. They report this ground has averaged \$2 per yard in a ditch across the pay streak.

John Munson owns 160 acres on Ingalls and Lincoln Gulches, tributaries of Lake Creek, and worked it by sluice box and rocker.

On Lincoln Gulch, Gus Hurley worked 160 acres, situated about a mile above Ingalls Gulch, for many years, cleaning up \$400 to \$1,600 annually. This property is now owned by Messrs. Perry Collins & Co. of Fort Collins, Colo. The depth of this gravel has never been definitely ascertained, and panning gives results to a depth of twenty feet, the pay streak being noted at about three feet to bed rock. The width is reported at about 300 feet.



LAKE CREEK PLACERS.

The Storey-Walcott and Richie & Hughes placers produced satisfactorily in their day, and are now controlled by William Sturgis of Cheyenne and his associates.

The ground in this district has all been taken up, but the tributaries of the North Platte River, from the Wyoming-Colorado line to a point below Saratoga, in Carbon County, show equally good results, according to authentic reports, and the bars of the North Platte River between these points pan well, coarse gold having been taken out in several places.

LODE MINING IN ALBANY COUNTY.

Geology of the Medicine Bow Range.

The Medicine Bow Ranges consist of a core of granite, with smaller islands and spurs of the same material showing both in and through the associated metamorphic formations. The granite is usually of a reddish feldspathic variety, in many instances much altered and showing little quartz or mica, but in others showing a predominance of quartz, forming gray granites, and frequently showing strong evidences of metamorphism, especially in the outcrops, and which is usually limited in extent.

The metamorphic formations consist principally of Algonkian schists, usually lying on the granites and having a varying dip and trend or direction in different localities. These schists are of a number of varieties, some of which are local or limited in extent, the usual schist being a fine-grained black mica schist, and fine-grained horn-blende and tourmaline schist in bands varying from a few feet to several hundred feet in width.

Associated with these varieties have been noted muscovite or white mica schists and gneiss, and amphibolite schist in various localities.

The dyke rocks are locally called "diorite," but have been identified and classified by the United States Geological Survey as belonging to the Gabbro rocks. Several varieties have been noted. These dykes vary in size from a few inches thick to a huge sheet several hundred feet in thickness, and generally lie conformably with the adjacent schist and quartzite, having the same trend or direction and the same dip, but instances are noted where the dykes cut across the formation at a varying angle, and are noted in the granite near the New Rambler, on Douglas Creek. Associated with the schists and diorites are ledges or bands of quartzite and slates, which lie conformably with the including schists, as far as now known, and are usually of considerable extent.

It is noted that in many instances the foregoing rocks (schists, dyke rocks, quartzites and slates) often show an extensive and sometimes a complete metamorphism, and change from their original condition, leaving only the structure as a means of identification, the composing minerals being replaced by silica and lime, as, for instance, the schists near the Ferris-Haggarty mine are largely replaced by silica.

The dyke rocks usually show a weathered and softened condition in the vicinity of the schist alteration, but this is often local and does not affect the main body of the rock.

The Snowy Range, in the Medicine Bow Mountains, is distinct in formation from the adjacent country, and consists of trachite and quartzites, with an occasional dyke of porphyry.

On either side of the Medicine Bow Range the upper carboniferous limestones are noted, with the succeeding sedimentary formation dipping away from the main range until covered by the wash of the valley.

Mineralization.

The mineralization may be said to be general throughout these formations, but varies in quantity and composition in each locality.

In the granites, schists, dyke rocks and quartzites are found bunches, streaks and veins of the different forms of iron and copper, both oxidized and base, varying from a tiny crystal or speck to a huge mass a number of tons in weight enclosed in the adjacent rocks, and which may or may not be part of or related to the body of ore.

Ore Deposits and Ores.

In a district as little developed as this portion of the Grand Encampment country it is evident that the precise ore conditions may not be fully understood until greater depths have been reached and some of each class of ores and ore deposits fully exploited.

At present these are understood to consist of two classes, viz.: ores found in the hard, unchanged formation, the diorites and unaltered schists, associated with a vein quartz, as at the Blakeslee and Verde properties, south of Battle, as distinguished from the ores found as a contact deposit between two different formations, as at the Ferris-Haggarty and Doane-Rambler mines, and a fissure deposit, as at the New Rambler, on Douglas Creek, in the gray dioritic granite. The former may be termed original ores and the latter "secondary ores," or ores of replacement.

In the first case, sulphides of copper are found in the outcrops, with but little change beyond the shallow surface oxidization of the specimen, staining the adjacent rock with iron oxides and copper carbonates, often leaving the unchanged sulphides covered only with a thin film of oxides.

In the latter case, the sulphides are encountered at "water level, viz.: the level of permanent underground water, varying in depth in different localities and covered by a capping of iron oxides, known as the "iron cap," the "gossan" of the Cornish miner. This cap is usually a light, soft and porous brown oxide of iron, or limonite, sometimes silicious, and associated

with the limonite are noted forms of hematite or red oxide of iron in varying quantity.

Throughout the district have been noted a number of huge ledges of oxidized iron, notably at the Gertrude and the Hidden Treasure, near Battle, and on Iron Creek and French Creek, in the Medicine Bow Range. The cappings of these ledges are usually a very hard, silicious, red hematite, which gives place with depth to the softer iron oxide forms, more or less stained with copper.

In many instances the iron cap contains thin scales of native copper and shows stains of the green carbonate of copper or Malachite and some blue carbonate of copper or Azurite. Small amounts of Chrysacolla or silicate of copper are often found, as well as some of the rarer forms of the oxidized copper minerals, noted later.

The principal ores are the yellow pyrites of copper or chalcopyrite and "peacock copper" or Bornite, and the Covellite ores of the New Rambler. Some phenomenally rich copper glance or chalcocite has been struck, mostly near the surface, as in the Keener-Price at Battle, the Doane-Rambler and New Rambler and many other places, but in each case the deposit has been limited.

The works so far have shown that the ores immediately succeeding the oxidized ores underlying the iron cap are very rich, often running from 35 per cent to 49 per cent copper in car load lots, as shipping returns have shown, but this is evidently a secondary enrichment, due to the leaching of the iron cap above and gradually gives place to the lower and more permanent grade of ore that is reached as depth is gained.

It is evident that the permanent ores of this district, when opened up by deep workings, will prove to be a low grade Chalcopyrite ore, suitable for treatment by a concentrating, roasting and smelting process.

The Great Rambler Mine.

This property is owned by the Rambler Mining and Smelting Company, and is located on the crest of the Medicine Bow Range, just east of the Carbon-Albany County line, in Albany County, near the head of Douglas Creek, and was first opened up as a gold prospect. In 1900 the first copper was struck at a depth of sixty-five feet and the mine immediately began to ship high grade copper ore.

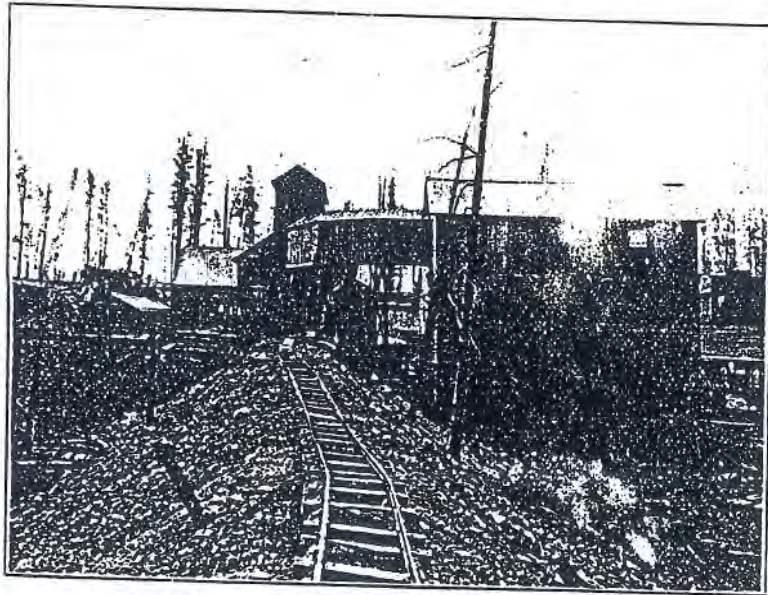
The formation containing the copper is a gray dioritic granite, with some micaceous schist in the vicinity, but the ore is found in a series of fissures in the granite, both extent and direction of these fissures varying in the different levels,

but having a general trend a little west of north and a dip of 40° to the east, as shown by the present workings.

The different lenses are connected by stringers and streaks of ore in the granite and form together an immense ore body, the full extent of which has not been exploited.

In common with other prominent properties in Southern Wyoming, the surface and outcrops of this property show the usual oxidized forms of iron or "iron cap," with an occasional copper stain.

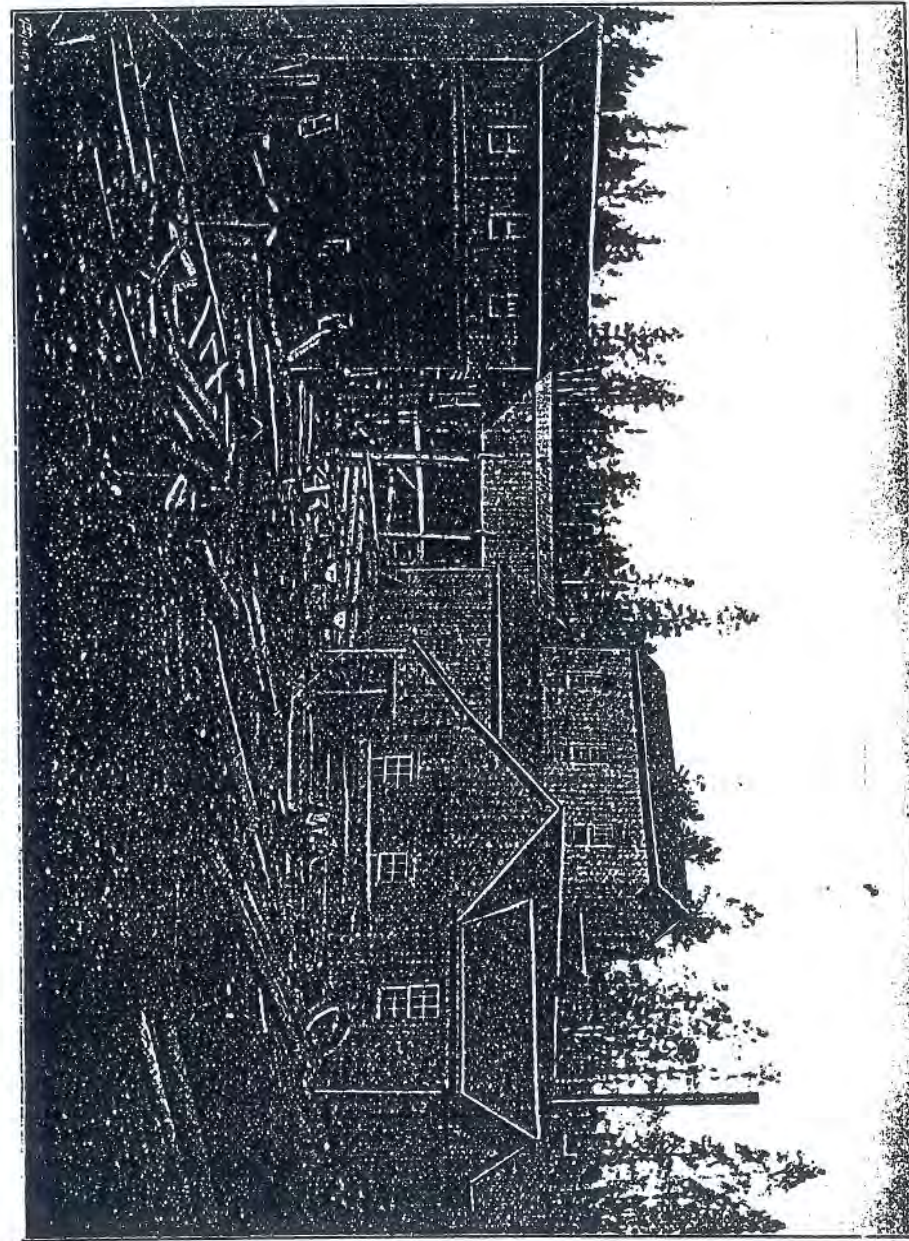
The capping here is usually a light, porous, spongy limonite, but in many of the upper workings hard red hematite is



SHAFT HOUSE AND ORE DUMP, NEW RAMBLER.

often noted, with what is called "Jaspilite" in small, hard bunches. The "iron hat," as this capping is called, here extends to a varying depth and gives place to the varying forms of copper minerals met with in this mine.

The Rambler mine is a veritable museum of copper minerals, and nearly all the known forms have been found here, either in quantity or as specimens. Native copper is noted in sheets often of a dendritic form, and as small nuggets. Copper carbonates, green and blue, are abundant, as well as the silicates of copper. The red oxide of copper, Cuprite, and the black oxides, Tenorite and Malacconite, are noted in quantity.



NEW RAMBLER MINE SHAFT HOUSE.

Covellite, or "Indigo Copper," is the ore that made the Rambler famous, as this variety has always been a rare form and seldom, if ever, found in the quantity in which it occurs in this mine, as only small specimens of this variety are usually found in the different museums of minerals.

Quantities of a very fine grained copper glance are found, carrying minute specks of unaltered chalcopyrite, similar to that noted in the Doane-Rambler mine on Battle Creek, in the Sierra Madre Range. Many of the other forms of copper are noted in small quantities, scattered throughout the gangue, which, as a rule, is silicious and contains some lime.

A remarkable feature of these ores is their comparative freedom from the minerals, such as bismuth, antimony, etc., which are frequently associated with copper ores and are a serious hindrance to the economical smelting of such ores.

Platinum has been found in the Rambler ores, occurring in the Covellite and showing 1.4 oz. of platinum per ton of ore. Palladium has also been noted in the Covellite ores with the platinum.

The mine has been developed by shafts and drifts, and has some 2,800 feet of development workings. A winze has been sunk on the ore for a depth of eighty-five feet below the lower level, opening an additional amount of ore. Developments have indicated the presence of a number of cross fissures in the formation, and further work on this theory will be awaited with interest.

The grade of ore at this property has been high and a number of cars of very high grade ore have been shipped especially that containing the glance and Covellite. Smelter receipts of these shipments show 1,928 dry tons of ore shipped, averaging 19 per cent copper and representing a gross value of \$77,622.

The general grade of the oxidized ores is low, about 10 per cent copper, and to treat these ores a matte smelter of forty tons per day capacity has been installed at the mine and successfully operated, as the ores treated are easily smelted and contain within themselves the necessary constituents for successful smelting and are known among smelting men as "self-fluxing" ores. The grade of matte shipped varied from 30 per cent to 60 per cent copper, the former being made during experimental runs and the latter during general practice.

The matte made and shipped is given as follows:

613,881 lbs. matte.
249,196 lbs. copper.
\$36,135.41 value.



MINERS' CABINS, HOLMES, WYO.



MINER'S CABIN, RAMBLER MINE, HOLMES, WYO.



HOLMES.

A first-class mechanical plant and buildings have been erected at the mine and work carried on in a thorough workmanlike manner. The mine has been idle for the past two years, the attention of the owners being directed to their other properties, but arrangements are now being perfected to open and work the mine to its full capacity.

Prospecting in this locality is difficult, as a heavy wash covers the ground to a depth of from two to twenty feet and outcrops are rare.

A great deal of surface drifting and trenching is, therefore, necessary to uncover the leads and determine the location of even preliminary workings.

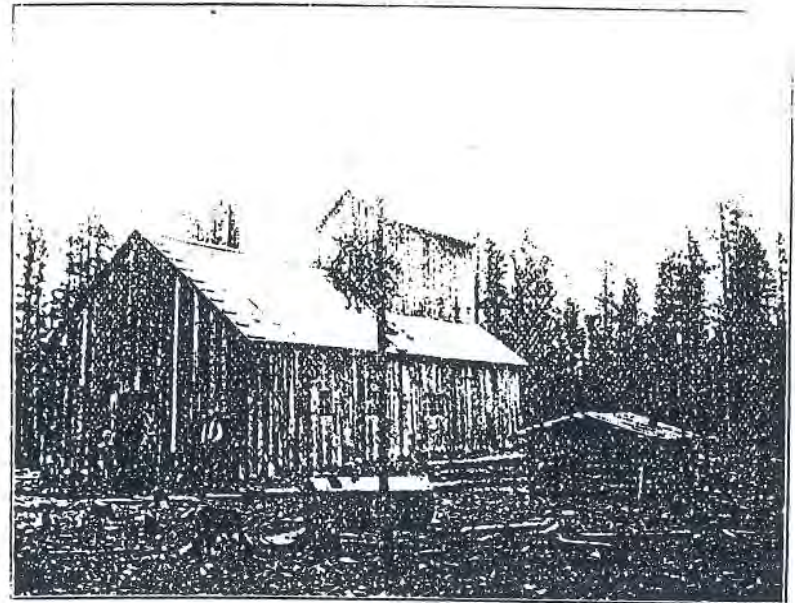
Holmes.

This town is at the Rambler mine, altitude 9,860 feet, and is the postoffice of the mine and adjacent country.

Adjoining the Rambler group is the Blanche property, owned by the Blanche Copper Mining Company, where a steam plant has been erected and a shaft sunk to a depth of 160 feet. At 120 feet carbonates of copper and some glance were found. The shaft was sunk to cut the Rambler ore bodies, the exact trend and extent of which has never been exactly determined, and the work on the Skylark claim of the New Lincoln Copper Company, north of the Rambler, is being done with the same end in view. A similar plant was set up on the Duchess property, west of the Blanche, and sinking is going on.

East of Holmes is the Albany group of the American Copper Company, where a shaft has been sunk 370 feet on a low grade copper ore and drifts run on the vein.

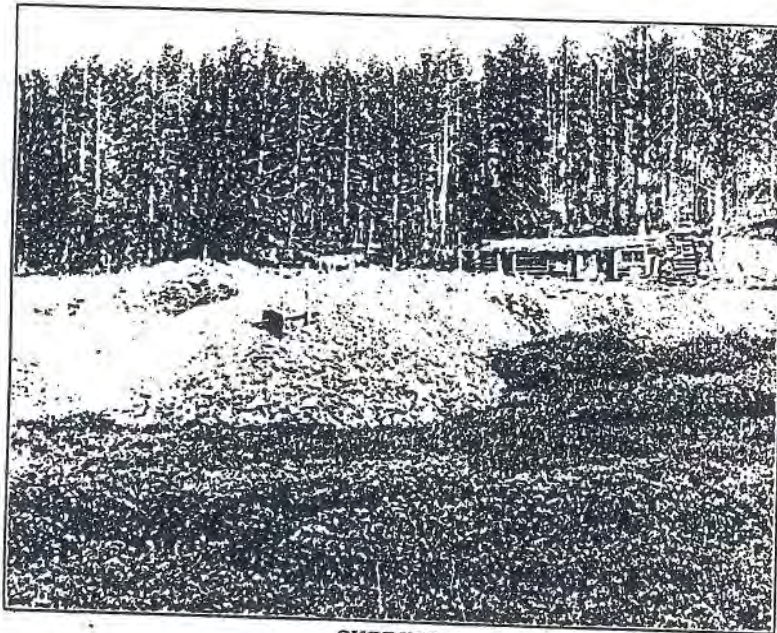
The Medicine Bow Mines Company, managed by William Benton, is running a cross-cut development tunnel to prove their principal holdings and also cut the ore already proven in the Cuprite shaft at a greater depth. The tunnel has reached a present length of 954 feet, has cut a number of bodies of ore,



BLANCHE MINE—HOLMES DISTRICT.



CUPRITE.



CUPRITE.



CUPRITE.

and values in cobalt, copper and gold are reported in these ores. The tunnel will cut the Cuprite ore at a depth of 200 feet, and the development has shown a good proposition.

On the Bear claim, near the Cuprite, a heavy vein of quartz, carrying gold values and showing the usual oxidized iron surface ores, has been opened up and a shaft has been started for deeper work.

At Keystone, altitude 8,800 feet, four miles south of Holmes, is the old Keystone mine, worked for gold during the first excitement in this region, and which, with proper manage-

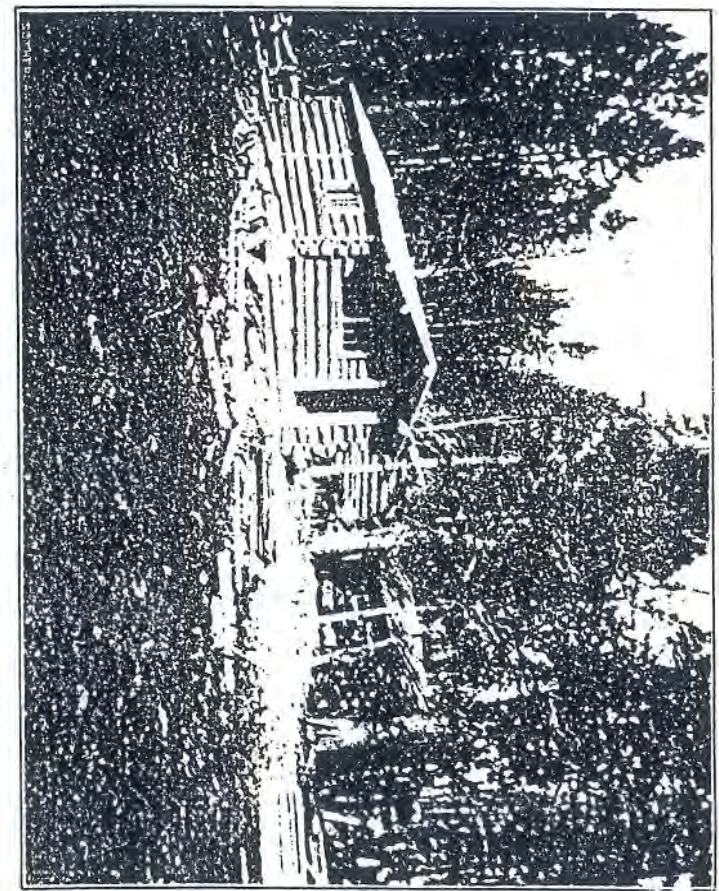


CUPRITE.



KEYSTONE MINE.

ment. would again make a production record. The shaft is 365 feet deep, and about a mile of drifts has been run on ore which supplied the twenty-stamp mill on the property. Near the Keystone is the Independence, whose surface showings indicate commercial bodies of ore and warrant their full de-

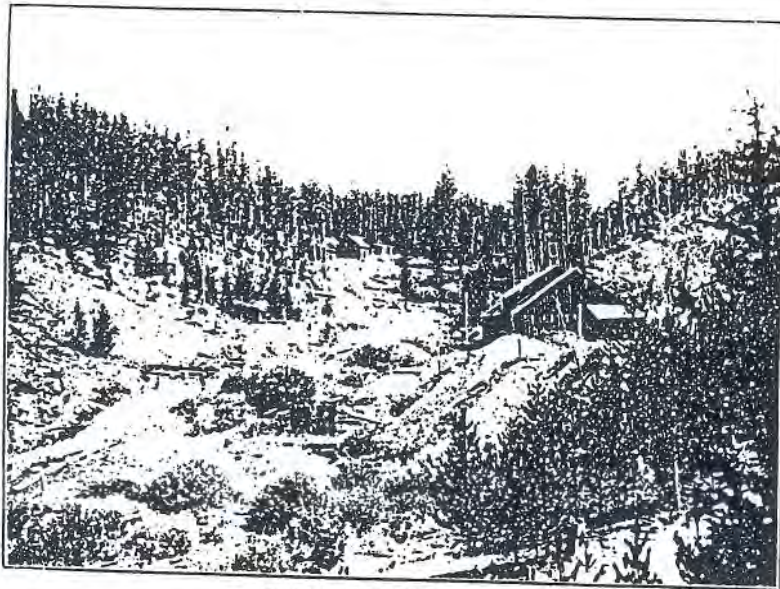


A MINER'S CABIN, AMERICAN COPPER CO., HOUMA, WYO.

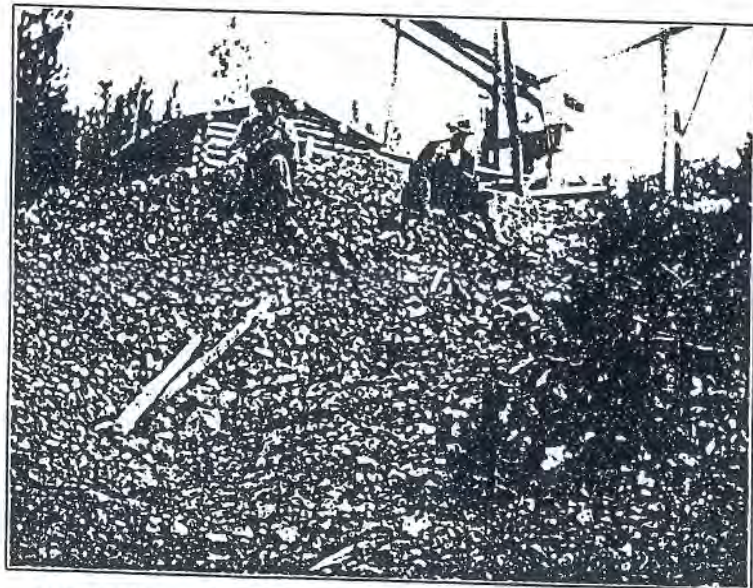
velopment. A quartz outcrop eight to ten feet wide, heavily stained with iron oxides and copper carbonates, extends through the group, and a shaft eighty feet deep, sunk through the vein with drifts to the ore, has shown up a body of milling ore.

The Florence mine is one of the oldest properties in the district, but for a number of years has not been in active

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THE FLORENCE MINE.



ORE DUMP, SHAFT NO. 1, MAUDEM MINE, HOLMES, WYO.

operation. On good authority it is stated that the Florence produced about \$50,000. The ore is partly free milling, and easy to concentrate, the value being carried in white iron pyrites in quartz vein matter from three to five feet wide. M. N. Grant: "I had tests made of this ore and found that it would Cyanide up to 94 to 96 per cent. In concentrating, there is a very heavy loss. This is on account of a very large per cent of the gold being so very fine that it will go off in the slimes. I found it not to be concentrating ore."

One of the most active and interesting works is the Tunnel being run by the American Copper Company on the Gold Crater group, on sections 15-22, township 14 north, range 79 west, near Keystone. Some very rich gold ore was cut in a stringer and sacked for shipment, but the main lead of the tunnel has not yet been cut. This is on what is known as the "Mammoth" lead, which has a remarkable surface showing for copper and gold, and the results of this deep work is awaited by mining men with interest.

On Lake Creek, about nine miles southeast of Holmes, are situated the Ottumwa and Maudem properties. The former is located on section 8, township 13 north, range 78 west, and section 1, township 13 north, range 79 west, and consists of four claims. The formation is granite and schist, and the mineral values show in a quartz ledge, which has been opened up to some extent by surface work and shallow tunnels along the outcrop. The main work is a tunnel being run to cut the main ledge, which is now in 280 feet, having about 250 feet more to run before the ledge is cut.

The Maudem group consists of three claims in the southwest quarter of section 1, township 13 north, range 79 west, and is developed by a tunnel being run in a ledge of quartz, and is now about 335 feet long, showing some fine ore. Other works on the property are three shafts having a total depth of 60 feet and another 100-foot tunnel. This property is owned by the Topeka Copper Company of Arizona, and work now projected for the season of 1906 is to continue the present tunnel and drift on the ore.

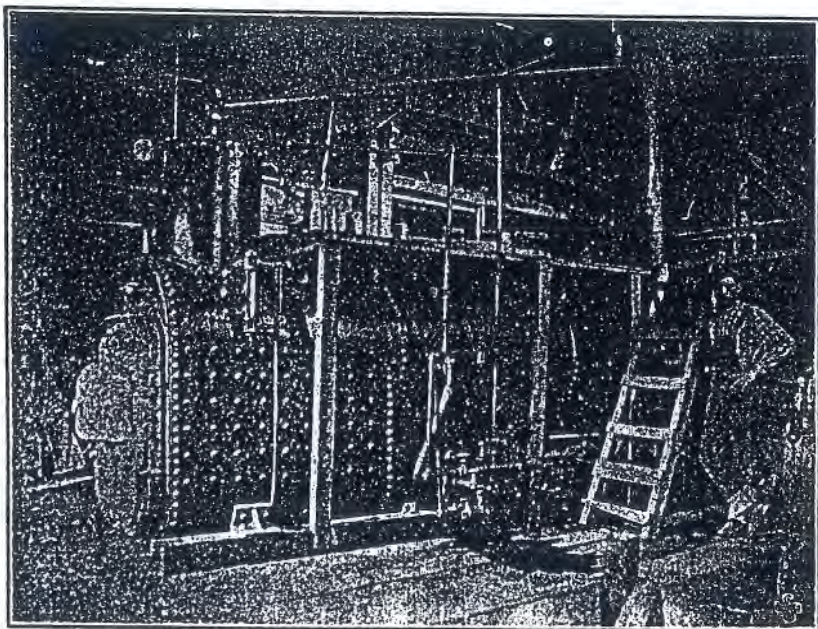
Snowy Range.

On this range, near the head of French Creek and Gold Hill, considerable prospecting has been going on for a number of years, and specimens of copper ores, both oxides and sulphides, indicate a continuance of the same conditions that are observed in the district and only await development to become profitable properties.

Gold Hill.

This covers practically all the camps lying along the Snowy Range and the Albany-Carbon County line, a number of them being in each county.

At Gold Hill the principal work has been done by the Acme Consolidated Gold and Copper Mining Company of Laramie and Boston, Mass. The properties of this company consist of twenty claims, comprising over 500 acres, lying both in Albany and Carbon Counties. Twelve of these claims are patented.



BOILER ROOM AT GOLD HILL.

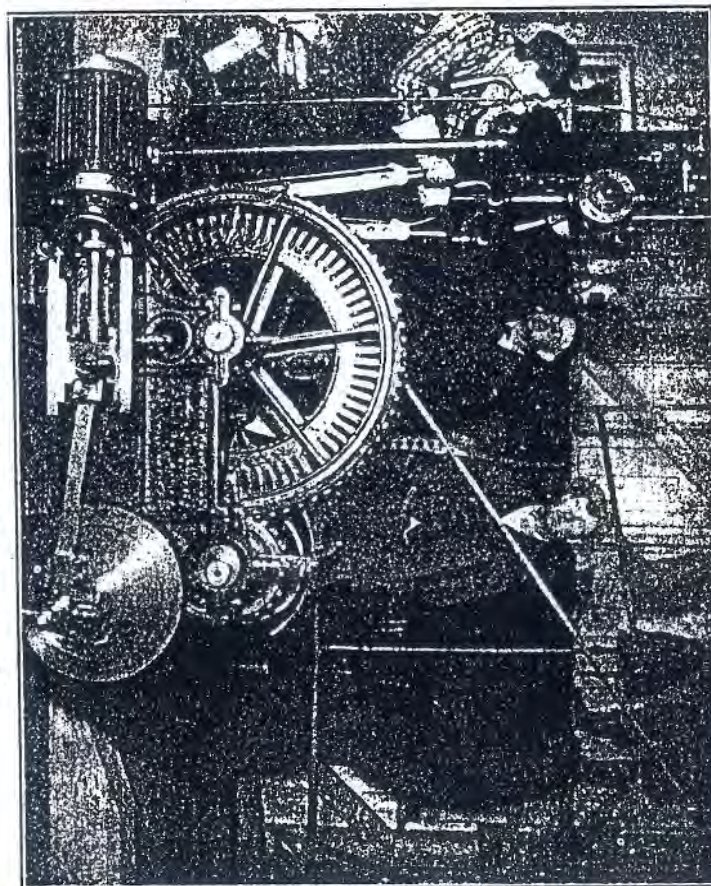
About 2,500 feet of development work has been done on this group and the ore in sight is returned at \$200,000. Work has been carried on for about six years, and during the season of 1906 extensive further development will be carried on.

This company also has extensive interests in timber lands, saw mills and improved property at Centennial and Laramie.

The Laramie, Hahns Peak and Pacific railroad is now in course of construction to Centennial, Gold Hill and Medicine Bow district.

Elk Mountain.

This is the most northerly of the ranges comprising the Medicine Bow Range in Wyoming. In common with the most of these ranges on this eastern side, the sedimentary limestones of the upper Carboniferous period lie on the schists and granites of the earlier formations, and at the Elk Mountain M. & M. Company's property, on the north side of Pass Creek, the ore is found at or near the contact of these formations.



HOISTING PLANT, ACME MINE, GOLD HILL.

This ore, in the upper workings, is copper glance, occurring in bunches common to this ore, but in the lower workings is giving place to chalcopryite, which is becoming more common as depth is reached. At the outcrops the usual iron

oxides were found staining the limestone, with some glauconite and a great deal of green copper carbonates as a stain.

This company is well equipped with electric hoist and other machinery to develop this property, which is believed to contain large bodies of copper ores on the contact of limestone and schist, and toward which the workings are being driven.

There are several other promising prospects at Elk Mountain, and the schists, dyke rocks, etc., as well as the granites, show a heavily mineralized condition that compares very favorably with the conditions in the rest of the district, where more development work has been done.

Centennial and Jelm Mountain.

These camps are located on the east slope of the Medicine Bow Range, the former having been prospected for gold almost exclusively.

Centennial, the present western terminus of the Laramie, Hahn's Peak and Pacific railroad, now building, has shown some remarkably rich gold ores, and the half dozen properties now working in this vicinity are making good showings and will be heard from later.

The Bradley is the principal property here and is to be systematically developed, after a thorough prospecting and working out of the surface conditions, by a tunnel on the vein to the main ore shoots, which have been cut in the upper workings.

Jelm Mountain is located south and east of Centennial, near the Colorado-Wyoming state line, on the Big Laramie River, and mining has been going on there for some years, development work having been done on a number of properties and mills erected.

The Wyoming Queen Company has been pushing development work, has erected a stamp mill and is working steadily with good showings. The ores reported from Jelm show a similar condition to the other parts of this district, the formation being gneiss and schist, and the ores copper sulphides and galena, with gold and silver values associated therewith.

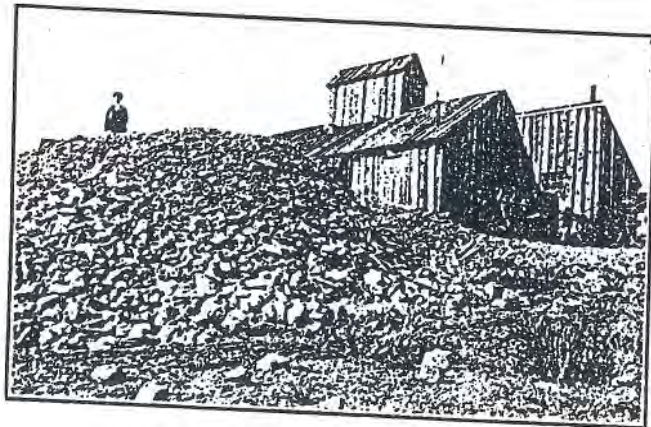
The Jelm District is close to the Colorado state line and distant about thirty-five miles in a southwesterly direction from Laramie. Encouraging work is being prosecuted here by several companies. The Laramie River, in close proximity to which the active properties are located, flows through the center of the district and affords an unfailing water supply for both milling and mining operations. The ores are gold and copper-gold, the camp having become known upwards of thirty years ago, when the Gold Hill mine was quite extensively

worked for its gold ores. Of late years, more attention has been given to the copper deposits, and considerable bodies of low grade ore have been opened up. Owing to the limited means of a majority of the operators rather desultory work has been carried on, but the indications are now that several companies will be able to extensively prosecute developments henceforth. One of the accompanying reproductions is a view of the town of Jelm, and the other shows the openings and dumps on the Annie property.

The Annie Mining Company owns a group of six claims and has under development a lead which is covered by their holdings for a distance of 3,000 feet on its east-west strike. This lead is opened by shaft to a depth of 140 feet. A 138-foot adit connects with the shaft at a depth of sixty feet. There is also lateral work at different points in the shaft. The average width of the lead is about seven feet. The walls are of granite and diorite associated with hornblende and tourmaline schist, while the gangue is a conglomerated mass of schistose and quartzose matter liberally impregnated with the pyrites of iron of copper. On the hanging wall side there is usually a heavy layer of red talcose material affording a clean cleavage of the ore. The lead as exposed in the workings noted carries copper values of from 3 to 10 per cent, while a two-foot body at contact with the reddish talc is of a grade of from 10 to 30 per cent copper. The gold values in the ore run between \$2 and \$3. From the 100-foot depth a 500-pound lot broken for a mill run sampled 6.3 per cent copper. Assays of ore broken from the two-foot high grade streak at a depth of 135 feet gave copper values of 29 per cent and gold values of \$2.30. The ore is of concentrating character, a six and eight-to-one product, being the result of mill tests. As depth is attained the formation shows more solid and the copper iron sulphide mineralization more general and uniform throughout the gangue. It is the intention of the company to continue operations by sinking the shaft an additional 100 feet. Engineers who have visited the district regard the Annie property as one of the most promising under exploitation.

The Wyoming Queen Mining Company is contemplating the installation of heavier hoisting machinery at its Colorado shaft, which has attained a depth of 250 feet. A definite conclusion in this matter will be reached at the company's annual meeting scheduled for the third Monday in September at Laramie. The present hoist is a small gasoline engine, which is inadequate for the deeper development planned. In the bottom of this shaft there is a good body of copper-iron pyrites.

Stringers of native copper are also in evidence. The Boston shaft sunk on a gold lead about 3,000 feet north of the Colorado is driven eighty feet. On the Rising Sun claim to the northeast of the Boston drift connection between the two 100-foot shafts is in progress. This lead, which parallels in strike and dip the Colorado and Boston veins, carries galena with which are associated gold and silver values. In addition to the work carried on through these three shafts, the remaining fifteen claims owned by the company are also being prospected by shaft, trench and pit work. In all of the workings a very encouraging ore showing is reported, and the indications are that with little additional depth pay ore of both shipping and milling grades will be encountered in larger bodies. The mine developments are being intelligently directed by the company's general manager, Mr. Louis Miller of Laramie. The secretary, Mr. L. A. Hancock, is located at Jelm.



WYOMING QUEEN COMPANY, JELM.

Work by the American Gold and Copper Mining Company on its group of eight claims which adjoins the Annie property on the southeast has been suspended since the death, some time since, of Frank Wyatt, the general manager and superintendent. Louis Miller of Laramie is now general manager, and at the company's annual meeting, held at Laramie on August 7th, plans were perfected for the resumption of operations on an extensive scale. Upwards of \$20,000 has been expended in mine development and surface improvements, which include a five-stamp mill built near the Laramie River close by. The ores are copper-gold, of concentrating character.

Examination of the Jelm Mines.

As a result of my examination of the Annie mining property, located in Jelm District, State of Wyoming, I submit the following report:

The property of the Annie Mining Company consists of five (5) claims, known as the Annie, Latrona No. 2, Lone Tree, Lone Tree No. 2 and Sunlight. Each of these claims are approximately 1,500 feet and 600 feet, or about 100 acres in all. They are situated thirty-two miles southwest of Laramie, Wyo., which is a thriving town on the Union Pacific railroad. It lies on the south end of Jelm Mountain, which is known as part of the Medicine Bow Range, and one-half mile from Laramie River, and four miles from the Colorado state line, and it is on the Great Copper Belt of Southern Wyoming, which extends from Tie Siding on the east to beyond Grand Encampment on the west.

Geology.—The general formation of Jelm Mountain is gneiss and granite, which both are good formations for permanent copper and gold values. The mineral veins run east and west and conformable in strike and dip with the dykes of diorite and granite cutting. The general formation evidences of alterations are frequently manifest in material mainly lime, with some silica. The formations are well mineralized, but the principal ore shoots are found in the contacts between the granite and adjacent rocks; the outcrops are lemonite and hematite, and showing quartz in ore; the iron oxides are associated usually with copper carbonates at the surface down to water level in the altered forms of copper ore, such as chalcopryite and other sulphite ores of copper.

Veins.—There are three distinct veins on the property. Two of those veins can be traced for a distance of 3,000 feet and the other 2,250 feet. Their croppings are strong and plain the entire length of the respective claims. These veins are about 150 feet apart. Vein No. 1 is dipping to the north at an angle of 60°, and veins No. 2 and No. 3 are dipping to the south about 70°, which shows those veins will form one body at depth. The average width of those veins are three to six feet. The walls are granite interlaid lime and diorite, associated with hornblende and tourmaline schist. The gangue is a conglomerate mass of quartz matter liberally impregnated with pyrites of copper and iron. On the sides of veins where work has been done there is usually red talcose material affording clean cleavage of the ore.

Workings.—The vein that is on the south side of the Annie claim there is a shaft 140 feet in depth, which shows good ore, as my samples will tell, and the vein in the center of the claim, no work being done on it, but the north side of the claim there is a shaft sunk 10 feet, which I worked myself, which shows body of good ore. When this shaft was started it was only a seam of oxide ore, but now at that depth it has developed into one foot of chalcopyrite and oxides ores. Those three veins will undoubtedly form contact at a depth of 500 feet.

Timber and Water Supply.—There is no timber on this property, but within three miles of the property there are thousands of acres of good valuable timber which I examined myself. The Laramie River runs through the district, about one-half mile of the property, which gives a large amount of water all the year around—in fact, almost unlimited power, equal to any in the world.

Roads.—There is also a good wagon road from Laramie to the property, kept in repair by the County of Albany, which is comparatively level. This road passes within one-fourth mile of the property. The road is passable at all times of the year. The climate conditions permit operations on these claims all times of the year.

Conclusion.—Under the direction of the practical management, there can be no doubt about this property but that it can be put on a paying basis and made a successful mining enterprise. The ores are principally copper and gold. The camp at Jelm having become known about twenty years ago and then worked for gold, no attention was given to copper, but the indications are now that it will make one of the greatest mining camps in the southwestern part of Wyoming, as the Jelm Mountain is classed in the great mining belt in which are the Ferris-Haggarty, Rambler, Douglas, Keystone, Independence and Ida May properties.

There is no reason why good ore should not be found if a depth is gained on many promising veins of the Annie property. This property I can cheerfully recommend to any persons wishing to interest themselves in mining.

Assays.—The following are copies of the assays of the above mentioned samples:

Houghton, Mich., Sept. 11, 1905.

(Laboratory Certificates.)

Sample No. 3448.

Marked Copper Ore "150 Ft."

Cu.....23.82.....per cent

THOMAS W. LAWSON, Chemist.

Houghton, Mich., Sept. 11, 1905.

(Laboratory Certificates.)

Sample No. 3447.

Marked Copper Ore "10 Ft."

Cu.....15.53.....per cent

THOMAS W. LAWSON, Chemist.

RICHARD ROSSKILLEY, M. E.,

Calumet, Mich.

It is not possible in a limited article, such as the foregoing, to deal with each prospect in detail, as there are numbers of meritorious prospects under development, scattered throughout the whole Medicine Bow Range, but these are given to show the extent of the mining activity of the region and give examples of the work under way. The investor may choose his own locality and prospect.

Cooper Hill.

In township 18 north, range 78 west, just west of the west line of Albany County, rising to the height of over 9,000 feet, is a bald mountain known as Cooper Hill. Topographically it belongs to Albany County, and is, therefore, described with its mineral resources. It is two and one-half miles long by one mile wide, and its longer axis runs nearly north and south. It is one of the oldest mining camps surrounding Laramie and was embraced in the old Herman Mining District, now extinct. The whole hill has the appearance of a mammoth porphyry dyke. It is cut by lesser dykes of diorite, quartzite, etc., running somewhat irregularly across it at an angle of nearly 45°.

It is remarkable for the richness of its float, not only of gold, but also of galena and copper. Fabulous values have been obtained from float on almost all parts of its surface. In one case the assay returned \$84,000 to the ton. A great deal of the work has been done on the east side of the hill. Near the foot a tunnel known as the "Croesus" was run west a distance of 1,400 feet, gaining a depth of about 600 feet. Most of this was along and in what the late Prof. W. C. Knight said was a "leached out diorite dyke." The tunnel was dry.

On the west side work has been much more scattered. The hill is very precipitous and rock-slides have occurred in several places. Some tunneling has been done in these slides, but it caves in badly. The Emma G., on the south end of the hill, has produced probably the richest float; the Albion, near the middle on the west side, the greatest body of gold and

galena, and the Richmond, near the north end, the greatest amount of free milling gold on near the surface. The Cooper Hill has produced the greatest amount of copper, while the Rip Van Winkle has produced the richest knife-blade seam in place.

A ten-stamp mill was erected at the south end of the hill some eight years ago and several hundred tons of ore from the Albion and Emma G. were run through it, but the values went off over the plates, and the tailings, heavy in lead, were richer than the original ores in gold and galena.

An immense dyke of "sugar" quartz runs along the west side, carrying free milling gold in every part, averaging from \$2 to \$2.50. At this time the Rip Van Winkle Consolidated Company is the only one doing systematic work.

I. R. SWIGART.

THE LARAMIE HILLS.

This is the name of the most easterly of the Rocky Mountain Range in Wyoming and covers the whole chain from the Colorado-Wyoming line to its northern limit in Natrona County, a distance of about 150 miles, and these hills are mineralized for the whole length of the range.

The principal formation is a reddish granite, usually very coarse grained and much fractured, and cut or broken by dykes and intrusions of gray granite, syenite, gneiss and schist, together with the usual dyke rocks, such as diorite and gabbro.

Dykes and intrusions of this sort occur throughout the range and are not confined to any one district or locality. It may also be noted that the ores of this range are shown in intimate connection with the fissuring and fracturing of the country rock caused by these dykes, especially in the southern part of the range.

The principal ores are copper ores, showing all the usual forms of copper, but usually copper sulphides where any deep work has been done.

The western slope of this range lies mostly in Albany County, but the properties best known lie scattered along the line of this and adjoining counties, and may be briefly noted here. South of Tie Siding and Sherman stations, on the Union Pacific railroad, there are a number of prospects that have produced copper sulphide ores. Masses of native copper weighing from an ounce to eighty-two pounds each were found at Tie Siding on the surface and in the granite, and several cars were literally gathered up and shipped to eastern smelters.

South of Buford station there has been considerable activity during the past year on a number of old prospects, and plants are being put in to thoroughly demonstrate the extent and continuity of these ore bodies to a practical working depth.

Hecla.

North of Granite Canon station is the old mining camp of Hecla, where there are a number of promising prospects, which, with a little more development and business management, would take rank among the producers of this state.

On the Louise claim of the Hecla Mining Company considerable ore has been taken out of an inclined shaft sunk on the ore. Drifts have been run on the ore showing a width of from three to four feet of ore, and a cross-cut to a parallel vein is reported by the owners as showing a width of eight feet of concentrating ore. A short, active campaign of development on this property would make it a permanent producer, if the mill belonging to the company were properly overhauled and adapted to the ore.

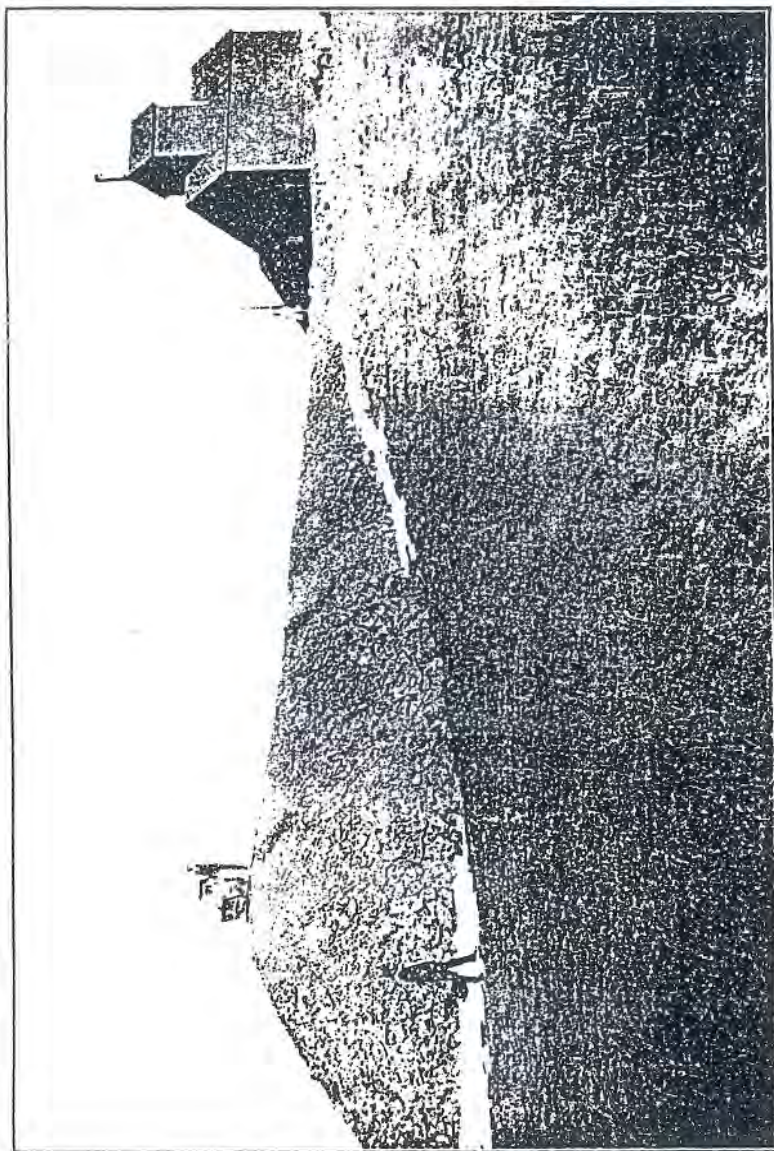
The Fairview property in Jawbone Gulch, north of Hecla, owned by the Globe Mining Company of Colorado Springs, Colo., has been reopened this year, and drifts run on the ore from the present main shaft have shown up a fine concentrating proposition and one which fully justifies a mill of suitable size to concentrate these ores.

Near the Fairview is the Ferguson property, which shows a fine vein and ore condition similar to the Fairview. It is now being opened up by Cheyenne capital, headed by Kelly & Lindsey of that place, and a shaft is being sunk on the ore. Each of these properties are fully capable of carrying themselves when properly handled and equipped.

At Hecla there are a number of other famous properties which have produced more or less during their history, and there is no doubt whatever that systematic development, with the present improved methods of handling these ores, would make a permanent and profitable producing camp.

The Strong Mine.

Passing north from Hecla and Silver Crown to the mines along the range, there are a number of promising prospects, but the next mine of importance is the Strong mine, on section 4, township 16 north, range 71 west. The Strong mine is owned by the Strong Copper Mining Company, of which Dr. I. R. Swigart of Laramie is general manager, and is one of



PART OF DUMP, STRONG COPPER MINING COMPANY.

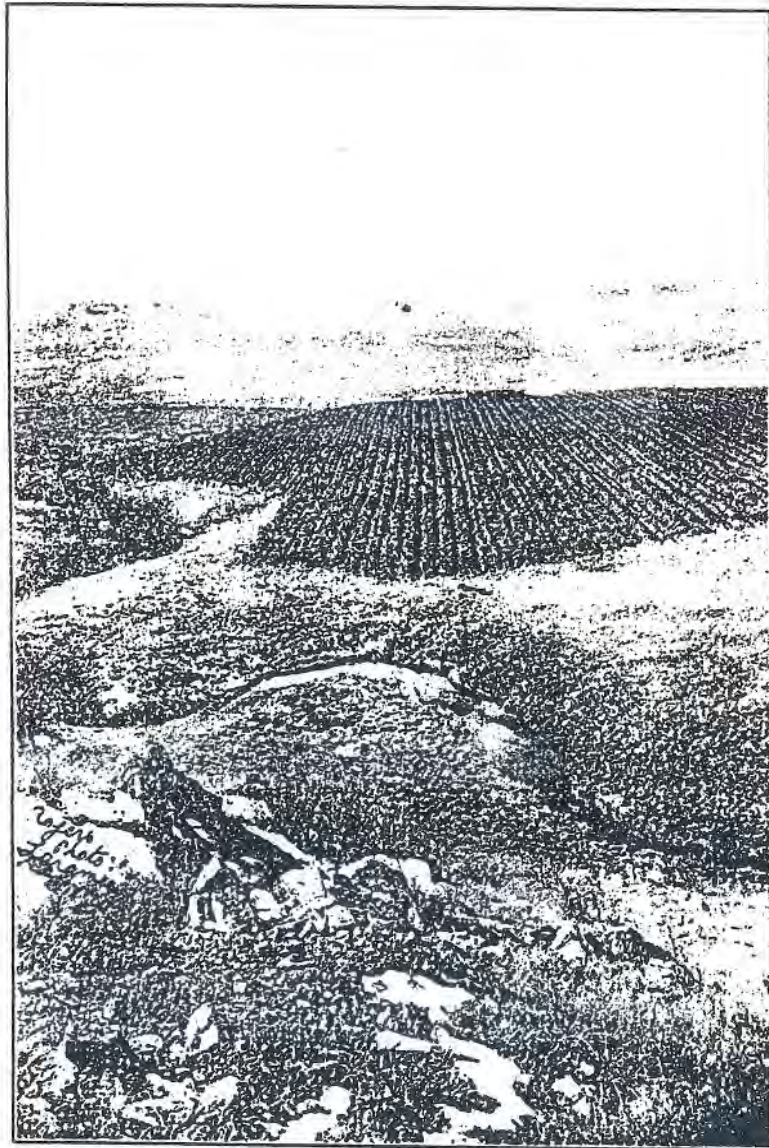
the most promising prospects ever opened up in Southern Wyoming. The formation at the Strong consists of a series of gabbro and diorite dykes cutting the red granite of the country and showing a crushed, fractured and fissured condition of the gabbro and other dykes, which is mainly responsible for the ore showings in the Strong.

The Strong has a complete mechanical plant, hoist, pump, etc., together with substantial buildings, and, under the management of Mr. E. P. Baker, has shown up a remarkable property. It is operated through an inclined shaft on the ore, following the vein, and drifts have been run on the ore at intervals of 100, 150 and 250 feet deep, the principal showing being on the 150-foot level, where the longest drift has been run. Here the ore shows the characteristic condition of the mine, showing a width of from two to seven feet of concentrating ore, with numerous lenses of high grade or smelting ore shown along the drift. On the 250-foot level cross-cuts have been run from the drifts north and south, and, at a distance of ninety feet apart, have shown a body of high grade copper glance, the full extent of which has not yet been determined, but enough has been shown to demonstrate that the same ores are shown on the 250-foot level as on the levels above, and that there is a great amount of ore in this mine. The present depth of the shaft is 335 feet, and a contract has been let to sink it to a depth of 360 feet during this winter. Drifts will be run on the ore at this level, as has already been done on the levels above, and another great block of ore added to the valuable resources of the property.

It is expected a concentrating mill will be erected on the property during the coming summer, and there is no reason why the property should not carry itself and create a sinking fund from the time the mill is started.

Within a short distance of the Strong mine is the Uleahomo, owned by the Uleahomo Mining Company of Laramie, of which Hon. LeRoy Grant is president. This company has sunk a shaft to a depth of 150 feet, on a ledge of quartz carrying iron and copper pyrites. Some remarkable gold values, running as high as \$1,000 per ton, have been obtained from this ore, which also carries silver, copper and nickel.

North of the Strong mine is the famous Iron Mountain country, where there is a mountain of titaniferous iron ore. North of this, in the Sibylee and Slate Creek country, there are a number of properties which have produced considerable ore from their surface workings, notably the Michigan, Iconoclast, Yont-Greentree and others.



MILL SITE, STRONG COPPER MINING COMPANY.

Cooney Hill.

North of these properties, on Slate Creek and vicinity, is the Cooney Hill mine, and the Emerald, on Slate Creek, owned by the Emerald Mining Company of Wheatland. On the Emerald there is heavily mineralized ledge lying in the schist, showing the usual iron cap of this locality and a shaft has been sunk on the ledge to a depth of sixty feet and a number of tons of copper ore sorted out from this work. There is a number of other stringers and ledges in this vicinity, and the material shown in the Emerald shaft has indicated a very promising property, which fully warrants considerable further development. The Cooney Hill property shows two ledges, one in the granite and one in the parallel schist running with the granite ridges. The latter shows a very heavy oxidized iron cap and some copper stains. A shaft has been sunk on this iron cap to a depth of 100 feet, showing coarse iron pyrites immediately underlying the oxidized iron cap, with some traces of copper sulphides scattered throughout the mass.

A characteristic feature of the territory lying in the Laramie Hills surrounding Laramie Peak are these huge ledges of mineralized schist, which are found throughout this whole locality. The Cooney Hill ledge is one of the most southerly of these, and from this point north to the Peak there are a number of such ledges upon which work is now going on. The surface showings or conditions of these ledges is usually oxidized iron, either limonite or hematite in their various forms, and these oxides are underlaid in turn by either pyrothite or white iron pyrites, usually carrying copper sulphides in connection with these minerals. The deepest shaft yet sunk on any of these ledges is that of the Cooney Hill, but north of Laramie Peak, in Albany County, there are a number of shafts which have reached nearly this depth, all of which show copper.

Antlers Mine.

The Antlers mine is situated twelve miles southeast of Laramie, Wyo., in the Black Hills Range. It is of very recent discovery, but, judging from the large quantity of ore in sight, it bids fair to become a successful rival of the famous Homestake mine of South Dakota. It consists of an immense "blowout" or chimney and is purely of eruption origin. It is elliptical in form and is about 300 feet wide by 500 feet long. The ore is composed of quartz and feldspar, with oxidized iron, assaying as high as \$15 per ton in gold. It is estimated that the whole body of ore will average \$8 gold

per ton. The ore is perfectly adapted to the cyanide treatment and can be mined and handled by this process for \$1.25 per ton, leaving a handsome profit. Development is unnecessary, as the ore is sufficiently valuable at the surface to insure a good profit for handling and will no doubt become richer as depth is acquired. It is estimated that there are 1,000,000 tons of ore in the first 100 feet of depth. The company owning this mine intends to install a large cyanide plant for the reduction of the ore at the earliest possible date. The mine is owned by the Antlers Gold Mining and Milling Company of Laramie, Wyo., of which Mr. T. F. Kellett is president and Eugene Greenwood secretary.

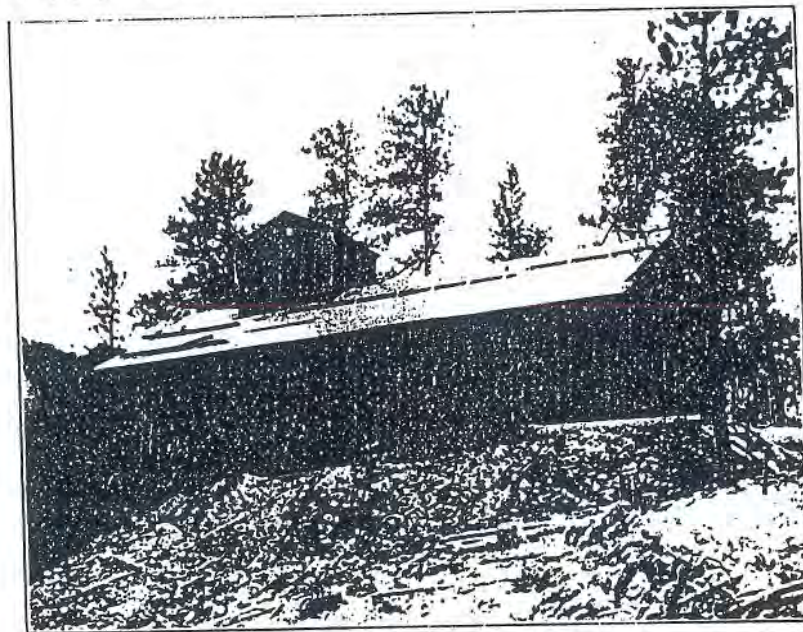


THREE CRIPPLES CAMP.

The North Laramie Peak Copper District.

The Maggie Murphy Copper Company, under the management of A. D. Lee of Douglas, Wyo., has located nine claims on one of these huge mineralized ledges and is now sinking a shaft which has reached a depth of 108 feet. In their main shaft, at a point about four miles north of the

Peak, the pyrrhotite was found to underlie the oxidized cap, and this showed considerable chalcopyrite, or yellow pyrites of copper. As the shaft was continued downward this condition increased and showed quartz coming in with the pyrites, the whole forming a low grade copper ore. It is the intention of the Maggie Murphy Copper Company to sink this shaft to a depth of not less than 350 feet and demonstrate the existence of commercial copper ores underneath these iron caps, and from all indications their faith in the property is amply justified.

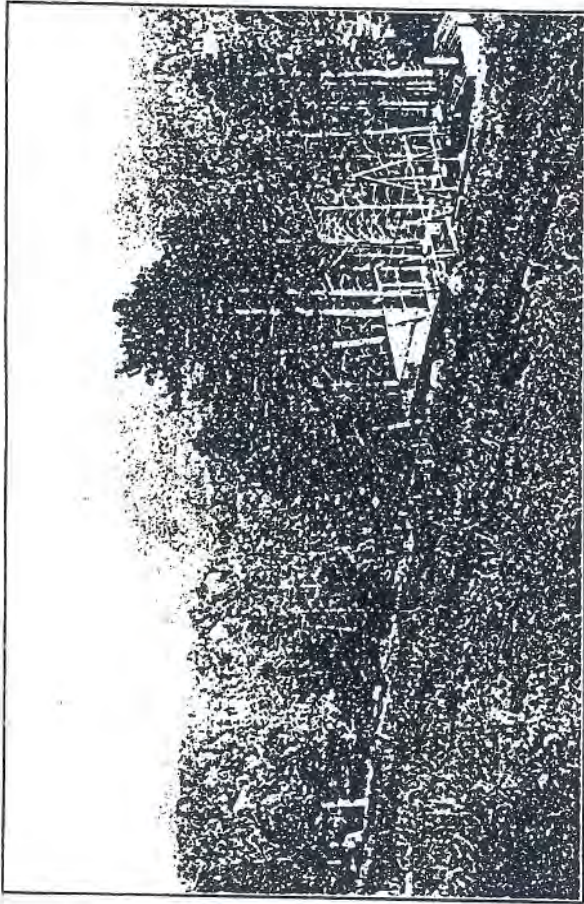


THREE CRIPPLES SHAFT HOUSE.

The Three Cripples Mining Company's property lies immediately north of the Maggie Murphy Company, and a shaft sunk eighty-five feet deep showed exactly the same conditions, and some remarkable gold values were found in this shaft. North of this property is the Tenderfoot, where a shaft was sunk on a spur from one of these dykes, but not on the ore.

East of the Tenderfoot is the Crackerjack, owned by A. D. Lee of Douglas, which shows a remarkable capping stained with copper, and north of the Crackerjack, at the corner of

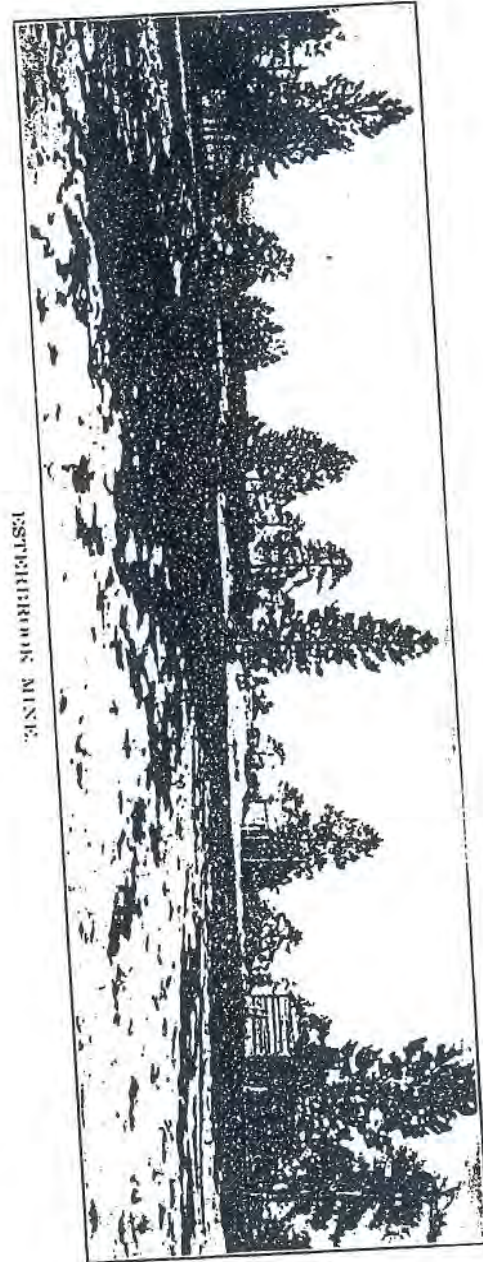
Laramie, Converse and Albany Counties, a shaft has been sunk on a similar showing owned by the Maverick Copper Mining Company of Douglas, Wyo. These properties have all shown similar conditions and are regarded by mining men as showing remarkable surface conditions, which are evidently underlaid by heavy bodies of low grade commercial copper ore.



MAGGIE MURPHY SHAFT HOUSE.

Esterbrook.

The Esterbrook property is the oldest property in the district, but shows a condition entirely different from these properties just described. The formation at the Esterbrook



ESTERBROOK MINE.

is a series of hornblende-biotite schists cut at right angles by dykes of diorite and granites. The Esterbrook vein cuts directly across both these schists and diorites and shows on the surface a silicious lead carbonate, of which several cars have been shipped from the surface and shallow workings. The Esterbrook shaft has been sunk following the ore and has reached a depth of 345 feet, and drifts and cross-cuts on the ore from this shaft are now showing up a fine body of ore, but its full extent or value has not yet been determined.

West of the Esterbrook and scattered along the Converse-Albany County line are a number of promising properties, notably the Trail Creek and Snow Bird on Elk horn Mountain; the Hoosier Boy, fifteen miles west of Laramie Peak; the Pyramid and LaBonte mines, in LaBonte Canon; the Mammoth and Lee properties, south of LaBonte Canon, in Albany County, and the Oriole mine, in Converse County, west of LaBonte Canon, one of the oldest and deepest workings of this North Laramie Hills vicinity. The shaft on the Oriole is 250 feet deep and has shown up a fine body of concentrating ore, which fully warrants the installation of a properly designed mill and other extensive works.

The North Laramie Peak Copper District bids fair to be one of the greatest copper camps in the state, and it is certainly worthy of the closest investigation for investors who are looking for large low grade copper properties.

THE LARAMIE CEMENT PLASTER INDUSTRY.

There are a large number of gypsum deposits in Wyoming which vary in composition from pure crystal to gypsite powder. The Laramie cement plaster is made from a deposit of gypsite just south of that city.

The Geology of the Laramie Gypsite Deposit.*

The Triassic formation, or "red beds" as it is commonly called, which is exposed all along the eastern side of the Laramie Plains, contains a great deal of gypsum and one stratum of considerable thickness near the bottom of the formation and only a little above the sandstone and limestone of the Permian and Carboniferous. This bed was struck in the University artesian well at a depth of 595 feet and the Permian sandstone at about 800 feet. The Red Buttes gypsum rock is found in this formation and doubtless the gypsum outcrop could be found at almost any point along the eastern side of the Laramie Plains within a half mile of the limestone and sandstone exposures which form the western slope of the Laramie Mountains. The silica and limestone washed down from these exposures have mixed with the disintegrated gypsum of the Triassic beds and have been deposited in depressions of the plains, forming numerous beds of gypsite or gypsum earth. These deposits can often be detected by the whiteness of the soil and the peculiar vegetation, which consists of clumps of grease-wood (*Sarcobatus vermiculatus*), such as grows on the alkali flats.

Gypsite, or the material from which cement plaster is made, contains beside the gypsum some 20 per cent of other material, such as clay, sand and limestone. The composition of the different products on the market is very variable and cannot be supposed to be alike in their value and use, but what difference a greater or less amount of lime or silica or magnesia has on the working of the plaster has not been determined. The action of these substances as a whole is to retard the time of setting and reduce the strength as compared with pure plaster of paris.

The Laramie gypsite bed has an average depth of about nine feet. From a few inches below the surface to about seven feet it is pure gypsite powder, then comes a red layer of five inches, and below this a foot or more of the white gypsite powder resting on gravel and red clay. The plaster material is as fine as flour, requiring no grinding or even

*Compiled from a bulletin by Profs. Slosson, Moudy and W. C. Knight, of the University of Wyoming.

sifting. It is plowed, harrowed and scraped up, calcined and loaded on the cars.

The Manufacture of Cement Plaster at Laramie.

Plaster of paris and a fine quality of stucco have been made at Red Buttes, near Laramie, since 1880, and since 1897 the Consolidated Company have been putting on the market a plaster made from the ground gypsum rock.

The Laramie cement plaster is made from the deposit above noted, which covers about 180 acres and has been worked since 1890. Annual output, about 2,500 tons.

Composition.

The composition of pure gypsum, from which the plaster is made, is as follows:

Calcium sulphate	79.1%	100.0 parts
Water	20.9	26.4
	<hr/>	<hr/>
	100.0	126.4

And of pure plaster of paris:

Calcium sulphate	93.8%	100.0 parts
Water	6.2	6.6
	<hr/>	<hr/>
	100.0	106.6

The composition of the finished cement plaster is as follows:

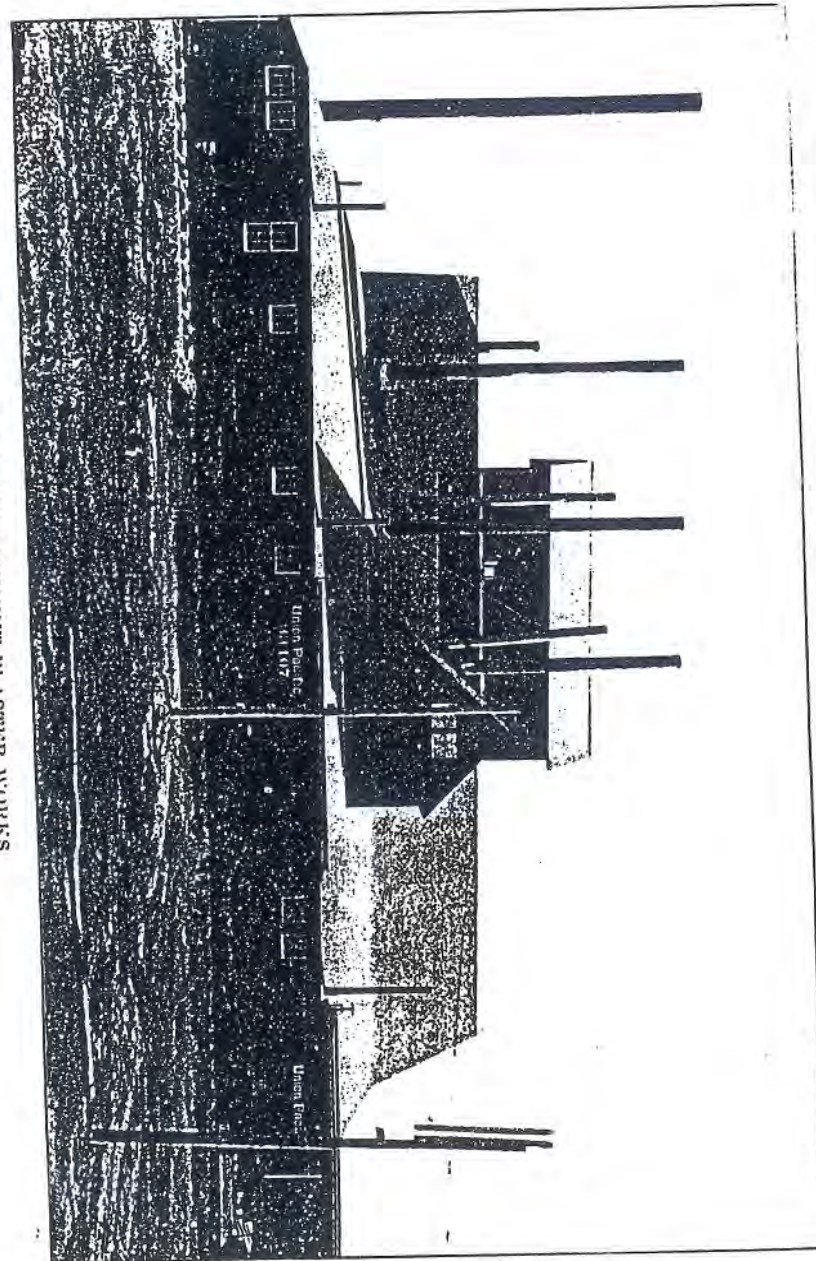
Water	6.93%
Insoluble residue (silica)	5.50
Alumina, Al ₂ O ₃59
Lime, CaO	37.11
Magnesia, MgO	1.45
Sulphuric acid, SO ₃	43.37
Carbonic acid (by diff.)	5.05
	<hr/>
	100.00

These may be combined as follows:

Water	6.93%
Insoluble residue (silica)	5.50
Alumina, Al ₂ O ₃59
Magnesium carbonate	3.04
Calcium carbonate	7.86
Calcium sulphate	73.73
Calcium oxide	2.35
	<hr/>
	100.00

There was a trace of iron, but too small to determine.

LARAMIE CEMENT PLASTER WORKS.
Our motto: "Make the best goods and guarantee them."



Crushing Strength.

The crushing strength of the three kinds of cement as marketed, with about same time of setting, is as follows:

Red Buttes cement plaster, without sand.....	5200
Laramie cement plaster, without sand.....	4065
Agatite cement plaster, without sand.....	3550

The Red Buttes plaster contained numerous soft spots where the plaster did not set, owing to imperfect burning. These were not found in the Laramie and Agatite plasters.

Although the individual particles of plaster are heavier than water, yet a bushel weighs 64 pounds, or 95 per cent as much as a bushel of water. A block of the cement plaster after it is set and dry, containing 50 parts sand per 100 parts of plaster, has a specific gravity of 1.5 compared with water. A cubic foot weighs 93.5 pounds. The sand used had a specific gravity of 1.5 and a ten-quart bucket holds 29.5 pounds.

ALBANY COUNTY COAL MINES.

The following data on the coal mines of Albany County is taken from a bulletin on "Coal Resources of Wyoming," by Prof. L. W. Trumbull, University of Wyoming, 1906:

This county has no large mines. For years there has been a small amount dug for local consumption. In fact, what was probably the first mine in the state was opened by the Denver and Salt Lake Stage Company in 1865, near where the old Overland Trail crosses Rock Creek. The coal was used for blacksmithing, and was carried to other points on the trail for this purpose.

But a small portion of the county is underlain by Laramie rock. The most southern point at which coal has been found is on the hills to the north of Centennial Valley. Here coal of inferior quality has been dug at various times, but the coal strata are so bent and crushed, and are tilted so against the mountains that the coal is much broken and slacked. It may be that farther to the east good coal can be procured at depth. In digging a deep well on Mill Brook coal was cut at 300 feet. One six-foot and one three-foot vein were passed through, but so far as known no samples of it were saved, so that nothing is known regarding its quality.

Coal is being dug for local use among the ranchmen in Coal Bank Hollow by the Monarch Coal Company, who report a production of 500 tons during 1904, which was sold at \$2. This opening is in section 8, township 19 north, range 77 west, and shows ten feet of coal. On Rock Creek the Diamond Cattle Company have an opening in section 7, township

19 north, range 78 west, which shows six feet of coal. This opening produced 200 tons in 1904, which sold for \$2 at the pit mouth. At this point the strata are nearly horizontal, but farther down the creek the country is much faulted. Coal can undoubtedly be opened up at different points nearly as far down as the Diamond ranch house, but it will not be in large, continuous bodies, owing to the faulting. This coal is of the Laramie age.

At a point a mile south of Rock River the railroad cut shows a thin seam of coal in older rock. At one time a slope was driven to open this older coal near Harper and several feet of good coal was exposed, but a sudden rush of water drove the workmen out and the opening has since caved. No data is obtainable regarding it.

Table of Approximate Analyses of Albany County Coal.

NAME OF MINE	Water	Volatile combustible matter	Fixed carbon	Ash	Sulphur	Total fuel
Brown.....	11.85	34.65	47.30	6.20	1.25	81.95
Brown (1894).....	11.25	36.85	45.00	6.90	1.13	81.85
Chase.....	14.50	34.50	44.75	6.25	1.03	75.25
Rock Creek.....	14.40	34.00	39.70	11.00	74.60
Rock Creek.....	11.50	32.40	49.70	6.40	82.10
Dutton.....	11.85	34.65	47.30	6.20	81.85

CLAYS, SHALES AND MARLS.

Reference is made in the general article on "The Geology of Albany County" to the later Cretaceous formations which compose the Laramie Plains, and in nearly all the recognized divisions or periods of this age are found materials suitable for commercial use, in some cases so pure as to require little or no additional material to become marketable products.

One of the most remarkable of these is the deposit of marl in the Niobrara Cretaceous formation that outcrops at a point eight miles southwest of Laramie and extends in a southeasterly and northwesterly direction along the range in common with the other formation exposed.

This marl is suitable for making Portland cement, is nearly pure and a greater portion of the deposit can be made into cement by simple calcination, and the remainder rendered suitable by addition of a little lime, which also outcrops in this vicinity.

Prof. L. W. Trumbull of the University of Wyoming states that the composition for commercial purposes is as follows:

Carbonate of lime.....	75%
Silica.....	10%
Alumina.....	6%
Small amounts of iron, etc., which vary.	

This deposit is most available at the above point, where it is fifteen feet thick, where it is practically uncovered for a width of 1,200 feet and extends with other formations along the range, where it outcrops at various places and under various conditions.

The shales of the Fox Hill Cretaceous are utilized by the Wyoming Pressed Brick Company of Laramie for the raw material for their brick, which are rapidly becoming commercially important. The shales are mined at a point two and one-half miles west of Laramie, are at present hauled by team to the yards in town, ground and puddled and made up into two classes of brick for the general market. The present capacity of these yards is 1,500,000 bricks for the season, which can be doubled at any time.

These brick are of a beautiful red buff color, stand a test of 5,000 pounds per square inch and weather splendidly. The South Omaha passenger depot on the Union Pacific railroad is built of these brick, and other prominent buildings. The brick are quoted at \$0.50 and \$15 per M., f. o. b. cars, Laramie. Dr. A. B. Hamilton is secretary of the above company.

The clays of the Fort Benton period attain a commercial importance in the utilization of the "soap clays" or "Bentonite," which occur in massive beds at Rock Creek and other points in this county. These clays have been mined and shipped for years by Mr. William Taylor of Rock Creek, and there are other deposits in that vicinity. This clay contains, by analysis, silica, alumina, magnesia, iron, sulphur and water, samples having shown over 80 per cent silicate of alumina, 3 per cent magnesia, 1 1/2 per cent lime and sulphur, 1 per cent iron and 6 per cent water. This clay is used as an adulterant, as a filler in paper making and medical purposes, being worked up and sold under the name of "antiphlogistine" after being known and used for years by Indians and stockmen for the general purposes of this medicine.

Other clays there are up and down this range and other ranges, and these three materials are only given to show the vast variety found here and the opportunity that exists in these scarcely known and certainly little worked fields for the man who has made these materials his practical study and who knows their cash value when properly handled.

BULDING AND LIME STONES.

Building stone of nearly every desired kind, from granites to the softer sandstones, lie east of Laramie along the Laramie Hills and in well-nigh endless quantity.

Two miles east of the city, on a spur of the Union Pacific railroad, are the quarries of limestone which supply a number of the sugar beet factories of Colorado with the pure limestone so necessary to this process. Their beds extend along the range northerly and southerly for about ten miles or more and are practically pure lime, running as high as 96 per cent carbonate of lime. During the season of 1905 40,000 tons of this limestone were shipped to the sugar beet factories and 10,000 tons for commercial use. Comment on the advantage of this limestone for burning lime and other purposes is unnecessary.

SODA DEPOSITS.

The soda deposits of Albany County consist of two groups of lakes—one located about twelve miles southwest of Laramie and the other twenty-three miles southwest, the first group of lakes being owned by the Union Pacific Railroad Company; the second by the First National Bank of Laramie and an English party.

These lakes have been operated and soda used since 1873. The lakes contain probably 100,000,000 cubic feet of crystallized sulphate of soda, and in places the deposit of soda is twelve feet thick.

In 1876, at the Centennial Exposition, a solid cube containing over 200 cubic feet of crystalline sulphate of soda was exhibited. At the World's Fair in Chicago a cube fully as large was shown; also another of the same extraordinary size was exhibited at the St. Louis Fair.

The chemical analysis is as follows:

Water.....	54.98
Sulphate of soda.....	44.55
Chloride of calcium.....	.43
Chloride of magnesia.....	.04

These are the most wonderful deposits of soda in the world, only waiting for some person with capital to come and open them up.

RAILROAD AND STAGE LINES.

One thing an investor always wishes to know is, "How long will it take me to make a trip to the property?" and, "How far is it from a railroad?" To answer these queries the following has been carefully compiled:

The Union Pacific railroad crosses Albany County in a northwesterly and southeasterly direction, dividing the county into two unequal parts, the major part being north of the railroad. For time of arrival of trains and information pertaining to the railroads, all are referred to the agents and time-tables of the Union Pacific railroad.

The Laramie, Hahns Peak and Pacific railroad has built a grade to Centennial, thirty-two miles west of Laramie, and has ten miles of rails already laid and work of construction now in progress, but are not yet in active operation.

Laramie City is the practical center of the county, and all portions of the county may be readily reached from that place by team or by stage lines. Well equipped livery barns are located there and rates are reasonable. Roads throughout the county are good and no unnecessary delays need be encountered in getting through the country.

A stage and mail line leaves Laramie daily, except Sunday, south, for Woods, 33 miles; Jehm, 37 miles; Cowdrey, 67 miles, and Walden, Colo., 77 miles from Laramie. Teams at Woods for near-by camps.

Stage and mail line, leaves Laramie daily, except Sunday, west, for Centennial, 32 miles, and Holmes, 56 miles from Laramie. Livery at Centennial for Gold Hill and camps on the Snowy Range. Teams at Wright's ranch stage station for Keystone and other Medicine Bow Range camps.

Stage and mail lines leave Laramie Monday, Wednesday and Friday of each week, west, for Mandel, 15 miles, and Morgan, 38 miles from Laramie. This is the line to Cooper Hill camps.

Stage and mail line leaves Laramie on Monday, Wednesday and Friday of each week, north, for Wayside, 20 miles, and Sibylee, 46 miles from Laramie.

Stage and mail line leaves Laramie Tuesday and Friday of each week, east, for Leslie, 18 miles. This is the route to the Strong mine.

Stage and mail line leaves Rock River on Monday, Wednesday and Friday of each week, north, for Rock River, 11 miles; McGill, 23 miles, and Garrett, 44 miles from Rock River.

Line leaves Garrett, north, for Toltec, 23 miles further, on Tuesday, Thursday and Saturday of each week.

Stage and mail line leaves Rock River on Tuesday, Thursday and Saturday of each week, south, for Rockdale, 12 miles, and Arlington, 16 miles from Rock River.

Livery teams may also be had at Rock River for these and other points.

Stage and mail line leaves Medicine Bow station on Tuesday and Friday of each week, north, for Marshall, 38 miles, and Little Medicine, 48 miles from Medicine Bow. Also livery teams at Medicine Bow.

Livery teams at Tie Siding for points south of railroad near Wyoming-Colorado line.

Points herein mentioned in the Laramie Hills along the Albany-Laramie County line may be conveniently reached from Wheatland and other points on the Colorado and Southern railroad from Cheyenne to Orin Junction. Trains run daily, except Sunday. Dover, Cooney Hill, Slate Creek, Owen, Fish Creek and Binford, distant from Wheatland from 15 to 40 miles, may be reached as above.

Esterbrook and Spring Hill points may be reached from Douglas, on the Chicago and Northwestern railroad, 40 miles, or from Glendo, 25 miles, on the Colorado and Southern railroad, as above. Livery teams may here be had to cover the North Laramie Peak Copper District without delay or trouble.

THE STATE OF WYOMING PROTECTS INVESTORS.

The State of Wyoming has passed laws and appropriated funds to provide for the protection and information of those who invest within its limits, and information regarding these laws and the resources of the state may be had for the asking.

Many of the mining properties mentioned in this pamphlet are registered under Chapter 92, Session Laws of Wyoming, 1905, which provides for a voluntary sworn statement filed with the State Geologist, by the proper officers of the company or by individual owners. Copies of this law and the mining laws of Wyoming sent free on request. Address the State Geologist, Cheyenne, Wyo.