material so collected, as made by Mr. F. M. Seamon of El Paso, is here given:

True silica	62.10%
Alumina	22.03
Ferrous oxide (monoxide)	2.57
Ferric oxide (Sesquioxide)	2.86
Calcium oxide	5.90
Magnesium oxide	2.94
Oxide of manganese	Trace
Loss on ignition	.45
Alkalies (not determined)	.....
Total determined	98.85%

Under the glass, the sample appeared to contain small rounded grains of silica or sand and some small dark colored particles; the latter being feebly attracted by the magnet. Ninety-three per cent of the sample was insoluble in acids. No chlorine or chlorides were found to be present in the ash.

The last eruption took place on February 8th, of the present year, at 10:30 p. m. This spectacle was a magnificent sight, due to the pouring out of red hot lava down the mountain side. A violent earth shock accompanied the lava outburst which seriously injured many buildings for a distance of forty miles from the center of disturbance. A second detonation occurred four days later on February 12; this shock was not nearly so severe as the one on the 8th. The shock on the 8th of February was due to the blowing out of the old lava core that plugged the conduit. It is thought that about two hundred feet was blown from the crater top at the time of explosion. At this writing the volcano is in practically a state of quiescence, emitting only a small amount of white vapor which is barely discernable at its base.

Volcanic eruptions are generally attended by earth tremors or shocks of greater or less violence; the complex nature of the subtle forces present is not well understood.

Magmatic aqueous vapor, in conjunction with other gases, subjected to enormous pressure find their way of escape from their prison, through the earth's crust at the points offering the least resistance. These conduits or vent-tubes build cones about themselves from their ejecta. The nature and classification of a volcano is determined by its ejecta.

Oftentimes the fine volcanic ash is suspended in the upper atmosphere for periods of months and even years. In the noted eruption of Krakatoa in 1883, the volcanic dust reached a distance of seventy-five miles above the earth and remained suspended in the upper regions of the atmosphere for a period of nearly two years.

During the eruption of Colima in 1903, the writer had published a short article, calling attention to the dust particles so conspicuous in the late fall of that year in the higher air currents. The resplendent sunrises and sunsets at that time were attributed by him to the dust from the Colima volcano. The article was commented on more or less by the scientific press of the country and the writer's views were generally accepted as correct. This peculiar haze did not disappear until late in February of the following year.

The National Geological Institute of Mexico has recently selected Dr. Paul Waitz, an English Geologist, as special emissary to investigate the nature of the February eruption of the Colima volcano of the present year and make such other special studies of the same as he may see proper and embody his investigations in a report to the Institute. Such report by Dr. Waltz will be awaited with interest by the scientific world.

A NEW MEXICAN DIAMOND.

Miss Juanita Gentry, 13 year old daughter of T. R. Gentry, who lives eight miles south of Tucumcari, N. M., found a diamond stone on her father's claim a short time ago, and it has proven to be a real diamond. The stone was found in some dirt that was taken out of a well. Mr. Gentry sent the stone to a firm in St. Louis which

THE ROSEDALE DISTRICT, NEW MEXICO.

By B. A. Slatz.*

In former articles written for South-Western Mines we described the Mineral Deposits of the Magdalena mountains and the Tuerto (San Pedro) mountains. In the former the mineralization was due to the permeation of the fracture zones by gases of various kinds among which water above the critical temperature predominated, and in the latter there is little or no evidence of the presence of water or its action. In this article we are going to describe a mineral zone due entirely as will be seen from the evidence produced to the action of heated water or hot springs. When the vulcanic activity was in its decline and during the period of gradual cooling of the magma there were formed in this region many hot springs. These springs were the last phase of vulcanic action; hence we may say that the mineral deposits of Rosedale District were caused by the last breath of a dying volcano.

Location.

The town of Rosedale is situated in the well-timbered San Mateo mountains in central Socorro county, New Mexico, about 30 miles west of San Marcial, the nearest shipping point on the Atchison, Topeka and Santa Fe Railroad. The camp is reached by a semi-daily stage from the latter point. The climate is arid with rare rains and occasional snows. The present water supply is piped down from a spring about three miles west of town.

General Geology.

The rocks in the immediate vicinity of Rosedale are all Tertiary Vulcanic and consist of rhyolite and its alterations, liparite and nevadite, in fact the whole San Mateo mountain range is made up of a light colored massive rhyolite, very fragile, and easily breaking up into small fragments. After the eruption and during the process of the gradual cooling of the magma, fractures were formed in it, and these became the channels for circulating solutions, probably ascending hot waters, closely connected with the vulcanism. These waters were remarkable for intensity of action, chemically changing the rocks they traversed, the main change being silicification, so that they are now more or less completely altered into quartz. This holds true particularly at or near ore shoots, where the mineralizing waters completely silicified the surrounding eruptive rocks for some distance away from the ore shoot. To complete the geology, there came now a considerable period of erosion, which stripped from the surface a great thickness of vulcanic material, leaving the more silicified portion standing out as strong ridges, and it is the finding of the ore shoots in these exposed places that brought Rosedale into existence.

Ore Occurrence.

The Rosedale vein can be easily traced by its outcrop which stands up boldly to the north-west and above On this ridge is located what is known as the Great London claim from there in a northerly direction one can easily trace the vein through the north half of the Rothshild claim, but from there north it is covered. In a southerly direction one can trace the vein on the surface through nearly the entire length of the Great London claim, from there south it is covered, but crops out again on the Contention Claim near its south end line. These veins belong to a type called linked veins. Their physical characteristic is that they branch and re-unite in both a horizontal and vertical direction. There is generally a main vein from which the smaller ones branch off and re-unite. Some times, however, these veins will subdivide until they finally die out. The Rosedale vein proper is strong, straight and well defined, and can be traced for a mile or more along the surface by its occasional outcrop, but it is not a true fissure vein. On first sight it has all the appearance of a fissure vein, but on close inspection it shows that it has been formed almost entirely by replacement of the rhyolite in which it occurs. It seems to have originated along a zone of especially strong fracturing in the rhyolite subsequent to the consolidation of this rock during a period of movement. These zones of fracturing, which are usually some four inches wide, became the chief channels of circulation for the mineralizing waters. It has been stated above that the rhyolite near the veins has been silicified to a very great extent, and the veins themselves seem to be the last stage of alteration, the rhyolite being mostly or entirely altered to quartz. A slight detailed study of the vein in the Rosedale mine gives abundant proof of its origin, for all stages of development can be seen in different levels of the mine. At many points the vein consists simply of a zone of more or less altered rhyolite, not essentially different, except perhaps for a little more silicification, from the rhyolite which forms the walls. This zone is cut by parallel fractures having the same strike and dip as the walls, and the walls are nothing more than stronger fractures of the same kind. In the next stage part of the fracture zone becomes altered to quartz. The main wall fractures have been the most favorable; so that sometimes a hanging wall streak of quartz and a footwall streak are found with only altered rhyolite between. Sometimes both these quartz seams are wanting. Next streaks of quartz parallel with the walls are found, or the quartz forms a network in the vein. This the process may be traced where almost the whole vein is a solid quartz vein several feet wide, but as a rule there is more or less rhyolite forming part of the vein.

All the ores so far produced have been oxidized ores. This oxidized zone extends in the Rosedale mine to the 700 foot level. The reason for this deep zone of oxidation appears

The town of Rosedale is on a high ridge

* Mining Engineer.

COLIMA VOLCANO IN ACTION, FEBRUARY 9, 1909.
Photo taken from Tecalitlan, 25 miles away.

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to be that the quartz veins on account of their brittleness, have been more readily fractured by strains than has the softer, less altered rock and so the veins afford channels for oxidising waters coming from the surface.

The ore consists of a very friable quartz breaking easily into small fragments. The iron which the rock contained is doubtless converted into limonite, while the decomposition of the carbonates has resulted in the formation of oxides of manganese. The richest portion of the vein shows a slight copper stain, while in places it contains streaks of iron oxide and black, sooty manganese ore.

Little is known of the unoxidized ore zone, but where opened near the surface they are entirely barren. The oxidized zones are by no means uniform, but the values in them seem better distributed. The reason for this is no doubt to be found, that during oxidation some of the values have been distributed from the richer portions, thus producing a larger amount of fair grade ore. It is also likely that during this process there has been some concentration of values so that the oxidized zone as a whole promises to be richer than the unoxidized. It is possible, for example, that those portions of the vein that have been eroded furnished a small share of their precious metal to the underlying portion.

In the oxidized portion of the Rosedale vein the richer ore lies in roughly defined north to south broad shoots, which pitch about five degrees to the west on the vein. At least two of such shoots, connected with poor ore between, have been opened.

Conclusions.

From the above description of the occurrence of the veins, it is seen that it is of the highest importance to distinguish and determine so far as it is possible, the silicified portion of the rocks. The outcrops of these silicified rocks is very limited, as in most instances we presume it is covered with later rocks. The position of the mineral-bearing strata away from its outcrop can not be very easily traced and even if found under its capping of later eruptives by far the largest portion of the veins so capped will be found barren, owing to the fact that the cap rock protected the vein so no oxidation could take place.

Wherever the vein outcrops it is worthy of careful but cautious prospecting. After locating the silicified outcrop, the question of finding the vein in it remains and after finding the vein the question of finding pay ore shoots within the vein. The geological evidence goes to show that the mineralizing waters which played so important a part in the vein formation were unusually active; hence a large amount of vein formation is indicated. Unfortunately most of the veins in the district will be unoxidized since they are protected by capping rock, and so is the Rosedale vein the most important so far discovered. In this protected portion, probably the largest part of the veins will be barren quartz in which, however, shoots, chimneys or irregular bunches of ore may be expected to a considerable depth. We are therefore, justified in our assumption that the veins have been deposited by hot springs in fissures as a last phase of vulcanic activity shortly after the close of eruptions and not far below the actual surface of the epoch of the early vulcanic disturbance.

ORGANIZE FOR FREE SILVER.

Ottawa, Canada, June 22. — The serious check to American exports to the Orient resulting from the great falling off in the silver exchanges last year, is attracting increasing attention on the Pacific Coast. A league which describes itself as the Fair Exchange League, has been organized in Ottawa to keep the issues before the Dominion parliament. It advocates the adoption of the Goschen plan of 1891, jointly by the British empire and the United States with open mints in India, as before 1893.

THE HASSAYAMPA.

What Broadway is to New York or the Common is to Boston, so is the river Hassayampa to the Territory of Arizona. Here was the first of the big gold discoveries; here happened much that has made Arizona unique in history, and it is in the name of the river that the veteran host of the Territory forefathers each season to tell such stories as will justify the reputation of the waters of the Hassayampa.

Hassayampa is an Indian name and signifies "pure water." It was born in the mountains and with royal patriotism refuses to leave its native hills. It flows through scenes of mountain grandeur, tight-walled canyons, spreading rinconades, places of piling rocks and little valleys where the fresh water-cress adds color to the golden sands. When it passes the beauteous places and finds itself confronted with the choice of extinction or of traversing mudded courses over common clay amid scenes of arid desolation, it deliberately sinks into the earth and appears no more within the sight of man. Indeed, it does likewise through certain long stretches of its own bed, and there are miles of canyon where the water never shows except in time of mountain flood. It is to be noted that these are the least favored of the courses along the canyon. Find a place where nature invites and all the view is good to the eye, and you will see the Rio Hassayampa come cheerily up from its sandy bed and begins to flow merrily as becomes a stream reputed the world around.

It was in the year 1863 that a party camped upon the banks of the stream and turned the horses out to feed on the grass that grows upon the hillsides. They were headed for the gold fields of California and were resting their horses by Hassayampa's waters. In the morning a Mexican, bringing in the horses, displayed two gold-filled pieces of white quartz and asked if that was the kind of rock the Americano was looking for. It was. It was the kind every American has been looking for since the toy fleet of Columbus drifted ashore and there began to be Americans. It was the same kind of rock that is keeping the nation stirring with a restless searching to this day. It was the purest kind of rich gold. The pieces were found on Rich Hill, which is a flat place up along the canyon side above the Hassayampa. Here came a rush of prospectors. A mining district was organized. The gold was everywhere. The water had washed the dirt away in many places and the nuggets lay strewn over the ground. The size of a mining claim to which a prospector was entitled was the size of the blanket he had brought with him from the town. He owned all the ground his blanket covered and he could take no more. A common day's work was repaid with a baking powder can full of gold. A tomato can represented but little better than the average. And men have never agreed as to the source of the Rich Hill gold. Some say it is in the ledges which once rose high above the river bed and which broke away, scattering quartz wherever the water willed. Others insist it is in the Octave and Johnson mines, through which run the ledges of quartz bearing gold in dust and wire and nugget. The river never tells, but the faithful in Arizona know that after every freshet there is a new supply of the precious metal spread like a carpet along the pathway of the Hassayampa. It is there and the river could tell all about it.

From the headwaters to the sink beyond the railroad there is gold in the placer sands and there are little stringer veins and big ledges of the quartz that bear the gold. After 45 years of mining the people of the river will tell you that it is still the richest mining and the best prospecting country in America. And probably they are right. There must be a thousand stamps lapping unceasingly on the rock of the Hassayampa gold quartz ledges and there are half that many arastras grinding on the stringers. Whether it be with the steam driven mill or the arrastra with its one burro power, there is always a day's pay of gold to answer for a day's work of every man.

There could not be so much gold without the history disclosing much of human tragedy. There were men in the early days who left Rich Hill with a burden of wealth and whose bodies were never found. There were others who hung from the limbs of trees because the owners of the gold saw them first. Then there was the one great tragedy which came from the one great effort to rob the river of all its gold at once.

It was planned that a dam—two, in fact—should be built to check the royal waters of the golden river. When these had been swelled by flood and fed by constant flow they were to be used to wash out the deeper sands and drive the gold from its hiding place. So planned the greedy miners. But the day of the flood waters disclosed the river raised to kingly wrath and ready to smite with a mighty force the barriers which men had made across its course. Men saw the danger. A rider was sent on a good horse to warn the settlers below the dams. He rode from place to place and called his warning. But it happened there was ,on the way, a vicious being who cared naught for human life. He sold liquor to those who had money. The bearer of the warning had money. Trade was light. The result was a drink and then another. The first brought forgetfulness and the second brought oblivion. So that night the waters rose and the messenger drank. People above who knew about the danger thanked God that the warning had been sent. People below went to sleep in blissful confidence. And between them the low keeper of the groggery stayed awake to count the money he had taken from the messenger who lay upon the floor.

The water battered down first one dam and then the other. Hundreds of men and women and children died that night. Next day the good men of Arizona laid them in graves dug in the golden gravel. The biggest nugget ever found along the river is said to have turned from the shovel of a miner who dug his partner's grave.

The Hassayampa asserted its right that night and it was never harnessed again. What need? It has made men rich. It has been the haven of broken men and the place to recuperate after every long debauch or unsuccessful business venture for more than two-score years. It has built cities. Prescott stands by progressive and strong in its urban life because of the Hassayampa. To a scarcely less degree Phoenix owes her vitality to the wealth of these waters. There is not a county in the Territory which has not benefited by the royal bounty of the Hassayampa.

And so it is that the Hassayampers can look with pride to the days when they first drank the water and vowed to go back again to the Hassayampa. For the life along the river made men and women of a kind that it is good to know. The Hassayamper can look the whole world in the face and be unashamed. Also he knows that at one time or another the whole world turns its face toward Arizona's famous river and prays—oh, how fervently—for more and more and ever more of its gold.—S. W. O.

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