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June 1, 1959

THE VULTURE MINE, WICKENBURG, ARIZONA

LOCATION -

The vulture Mine is on the southern margin of the Vulture Mountains about 9 miles west of the Hassayampa River and 14 miles by road southwest of Wickenburg, Maricopa County, Arizona. The present property consists of 12 patented claims, 14 claims ready for patent and approximately 70 located claims.

HISTORY -

The ore deposit was discovered in 1863 by Henry Wickenburg who treated rich portions of the outcrop in an arrastre on the Hassayampa River. In 1866 the Vulture Company of New York built a 40 stamp mill near the present site of Wickenburg and hauled the ore by wagon to the mill. Various other companies acquired and operated the property until 1917 and the records indicate that about \$6,800,00 worth of gold was extracted. In 1927 the Vulture Mining and Milling Company was organized and diamond drilling of the eastern extension of the ore obtained encouraging results. The United Verde Extension Mining Company became interested in the property and sank a 500 foot shaft in 1930. It was reported that underground results did not warrant U. V. X. to further participate in their agreement to develop the property. In 1931 the East Vulture Mining Company was organized and a 125 ton per day amalgamation and cyanidation mill was built. Feed for this plant consisted of old tailings and open pit ore west of the old workings. The plant operated continuously until 1942 when it was shut down by government order. Some of the milling equipment was moved to Bagdad Copper which was owned by the same interests.

June 1, 1959

GEOLOGY -

The Vulture Mountains are made up largely of andesitic and rhyolitic lavas which lie on schist and granite. Granite and rhyolite porphyry dikes are abundant. The Vulture Mine is near the southern margin of a moderately hilly pediment at an altitude of 2000 feet. This pediment is floored with quartz sericite schist, intruded by granite and rhyolite porphyry. Complex faulting has affected these formations. The Vulture vein system at the surface strikes slightly north of west and dips 45 degrees north. Gold occurs in mineralized quartz veins separated by sericite schist. The schist carried gold values. Widths up to 85 feet or more have been mined. Below the zone of oxidation the ore contains pyrite, galena, blende and chalcopyrite. Coarse gold was found in all parts of the developed mine.

DEVELOPMENT -

The workings extend downward through various shafts to 1550 west of a main fault zone. High grade ore has been removed to the 950 foot level. Portions of the ore zone to widths of 100 feet have been open pitted to a depth of about 150 feet. To the east of the fault zone, a 500 foot shaft and a small amount of lateral workings has been explored a portion of the area. Two wells, one presently operating, would provide sufficient water for any foreseeable requirement.

POSSIBILITIES -

This property has two distinct possibilities.

- (1) The developemtn of an open pit operation on the main zona of the old workings. There exists the possibility of blocking out 20,000,000 tons of ore to a depth of 500 feet.
- (2) The location of the extension of the ore zone to the east under the lava filled valley.

OWNERSHIP -

The present owners of the property are Messrs. Johnson and Turnbull who purchased the complete title to the property from East Vulture Mining Company in May 1959.

XXX

# *Ranger* OIL (CANADA) LTD.

505 EIGHTH AVENUE BUILDING

*Calgary, Alberta*

TELEPHONES:



ROTARY NUMBER  
AMHERST 3-1500

June 30, 1959

Mr. J. D. Mason  
Trans Arizona Corporation  
917 East Fort Lowell Road  
Tucson, Arizona, U.S.A.

Dear Jim:


Enclosed please find copy of letter from Lichty which is self-explanatory and a copy of his report on the Vulture mine, Wickenburg.

If you and George have time, it might be an idea to look into this property because if it has any merit, it might be handled with the Lakeshore operation.

Sincerely,

JMP/lmp

cc: Mr. W. B. Milner

  
RANGER OIL (CANADA) LTD.  
505 Eighth Avenue Building  
Calgary, Alberta

June 30, 1959

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Transarizona Resources Corporation  
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Sincerely

Jack

JMP/lmp

cc: Mr. W. B. Milner

4122 North 56th Street  
Phoenix, Arizona

June 25, 1959

Mr. J. M. Pierce  
President  
Ranger Oil (Canada) Limited  
505 Eighth Avenue Building,  
Calgary, Alberta. Canada

Dear Mr. Pierce:

I visited with Mr. Wright in New York on June 19th, and went over the Lakeshore copper property and its possibilities with him in detail. He advised that he would be in touch with you concerning future developments.

At the same time, re requested that I forward to you some data on the Vulture property near Wickenburg, Arizona. I have obtained a sixty-day option to purchase this gold-silver property outright and have started a sampling program which will indicate whether a large open pit operation would be possible.

Yours sincerely,

Lyall J. Lichty

C.C. W. H. Wright

some day be found in the east end, a new shaft from the surface would be necessary for economical working, and any further explorations had probably best be done by diamond drilling.

The purpose of this article is to put on record the facts concerning a remarkable gold mine, with the hope that it may be of service to others who may harken to the call of the Vulture.

## Iron-Ore Production in 1920

THE iron ore mined in the United States in 1920, exclusive of that which contained more than 5.5 per cent of manganese, is estimated by the U. S. Geological Survey at 67,773,000 gross tons, an increase of 12 per cent as compared with the output in 1919. The shipments of ore from the mines in 1920 are estimated at 69,558,000 gross tons, an increase of nearly 24 per cent as compared with shipments in 1919. The stocks of iron ore at the mines, mainly in Michigan and Minnesota, apparently decreased from 12,986,000 gross tons in 1919 to 11,145,000 tons in 1920, or 14 per cent.

The production of iron ore in 1920 was less than 2,000,000 tons below that of 1918 and is exceeded only by that of the war years 1916, 1917, and 1918. In 1920 shipments exceeded production by approximately 1,785,000 gross tons, but in 1919 production exceeded shipments by about 4,147,000 tons.

### LAKE SUPERIOR DISTRICT

About 86 per cent of the iron ore mined and shipped in 1920 came from the Lake Superior district, in which 58,173,000 gross tons was mined and 60,056,000 tons was shipped, increases of about 12 and 24 per cent, respectively, as compared with the quantities mined and shipped in 1919. These totals include the ore mined and shipped from the Mayville and Baraboo mines, in Wisconsin, and ore shipped by rail as well as water from all mines, but exclude manganiferous ores that contained more than 5.5 per cent manganese. The ore is chiefly hematite. The stocks of iron ore in this district apparently decreased from about 11,887,000 gross tons in 1919 to about 10,000,000 tons in 1920, or 16 per cent.

The shipments of iron ore by water from the Lake Superior district in 1920 (including manganiferous iron ore), according to figures compiled by the Lake Superior Iron Ore Association, amounted to 58,527,226 gross tons, an increase of 24 per cent as compared with these shipments in 1919. A total of about 1,529,000 tons is thus indicated to have been shipped by rail.

The mines in Minnesota furnished 67 per cent of the total iron ore shipped from the Lake Superior district in 1920 and 58 per cent of the total of the United States. The mines in Michigan furnished 31 per cent of the Lake shipments and 27 per cent of the grand total.

### SOUTHEASTERN STATES

The southeastern states, which constitute the second largest iron-ore producing area, including the Birmingham and Chattanooga districts, mined 6,663,000 gross tons of iron ore in 1920, an increase of 16 per cent as compared with 1919. The shipments of ore from these states to blast furnaces in 1920 amounted to 6,575,000 gross tons, an increase of 18 per cent as compared with shipments in the previous year. The ore contains about 78 per cent of hematite, 21 per cent of brown ore, and 1 per cent of magnetite. The production of ore in these

states in 1920 apparently slightly exceeded the shipments, so that the moderate stocks at mines and furnace yards were increased.

### NORTHEASTERN STATES

The northeastern states, which include New Jersey, New York, and Pennsylvania, in 1920 mined 2,027,000 gross tons of iron ore and shipped 2,070,000 gross tons, an increase of 12 per cent over the quantity mined and of 36 per cent over the quantity shipped in 1919. A slight decrease in ore stocks is thus indicated. Most of this ore is magnetite, and is subjected to concentrative treatment before shipment.

### WESTERN STATES

Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, Washington and Wyoming, the iron-ore producing states in the West, are estimated to have mined and shipped 734,000 gross tons of iron ore in 1920, an increase of 8 per cent as compared with the quantity mined and shipped in 1919. No large stocks of iron ore are maintained at western mines. Hematite predominates in the western states, but considerable brown ore and magnetite are mined.

### OTHER STATES

Other states, including Connecticut, Maryland, Massachusetts, Missouri and Texas, in which there are small iron mines that produce chiefly hematite and brown ore, mined about 176,000 gross tons in 1920, an increase of 63 per cent as compared with the quantity mined in 1919. The shipments from mines in these states in 1920 are estimated at 123,000 gross tons, an increase of 16 per cent over the shipments that were made during the year 1919.

## Prehistoric Monsters Overran Nebraska And Wyoming

What geologists term the Oligocene formations contain the fossil bones of a great variety of strange extinct animals. These strata are among the most widespread and most regularly distributed of the Tertiary sedimentary rock formations of the Great Plains, and cover a vast area in Nebraska and Wyoming.

The lower Oligocene beds, which are believed to be over a million years old, are often called *Titanotherium* beds, because they contain great quantities of the bones of extinct mammals of that name. They were clumsy brutes of elephantine size, according to the U. S. Geological Survey, having on the front of the skull a pair of great bony protuberances, which, although hornlike in form, were probably not sheathed in horn.

The animals of Oligocene time were apparently abundant as well as varied in kind. Among those characteristic of this epoch were primitive forms of rhinoceroses, peccaries, ruminants, camels, insectivores, and opossums. The saber-toothed tiger, one of the most formidable enemies of primitive man, first appeared in the Oligocene epoch. The horses whose history began with the diminutive four-toed *Eohippus* continued in the Oligocene. Hoglike animals were rather numerous. One of these was a formidable beast with curious protuberances on its head, the use of which is not known. Rhinoceroses similar to those now found in Africa and India lived in western America, and other rhinoceros-like animals were abundant.



quence and have interfered neither with development nor mining. Besides these, there are two major faults, which are known as the Talmadge and Astor faults. The Talmadge fault cuts the orebody off on the easterly end and on the dip, crossing the vein on its strike at an acute angle. The dip of the fault is 30 deg. to the northeast, which compares with the dip of the vein, 42 deg. to the north. The displacement of the vein is 300 ft. vertically. This fault does not outcrop at the surface, but is buried by gravel wash, a circumstance tending to conceal its true character, which was consequently not recognized until 1911. That this fault was encountered early is shown by the sketch, Fig. 3, and a quotation from a letter<sup>1</sup> written in 1872 by the superintendent of the mine to Rossiter W. Raymond, then U. S. Mining Commissioner:

"At a depth of 232 ft. below the surface of the mesa the fissure is found to change from a dip of 45 deg. north-northeast to an almost vertical position. . . . After sinking 50 ft. behind the foot wall, from the 232-ft. level, the fissure was crosscut and found to be 47 ft. in width, and having on the hanging wall a seam of blue clay some 12 or 15 in. thick. Outside of this was the hanging-wall rock peculiar to the mine above; but the fissure, throughout its width, was found to be filled with a hard black rock full of fine iron pyrites and some galena, and similar in character to the cap or barren filling which is found in many Colorado lodes."

It is interesting to find the correct interpretation of this puzzling geological structure by comparing the sketch, made in 1872, with the cross-section of the orebody as developed in 1918. So far as is known, no work was done deeper than that shown in the old sketch until 1911.

It is not easy to show these faults and their relation to the vein clearly and fully without a series of cross-sections or a model, but the two accompanying sketches, Fig. 2, will give an idea of the disastrous results of the faulting. The fault was encountered during the recent working of the mine on the 500 level near the plane of section A-A, and here it was from five to six feet wide between the walls and was filled with gouge and broken fragments of schist and quartz. For a short distance, in some places fifty or sixty feet, below the point where the vein was cut off, the fault contained so much crushed vein matter that the fault was profitably stoped for a considerable distance. The fault is mineralized discontinuously by calcite, which appears

<sup>1</sup>Mineral Resources West of the Rocky Mountains, 1874.

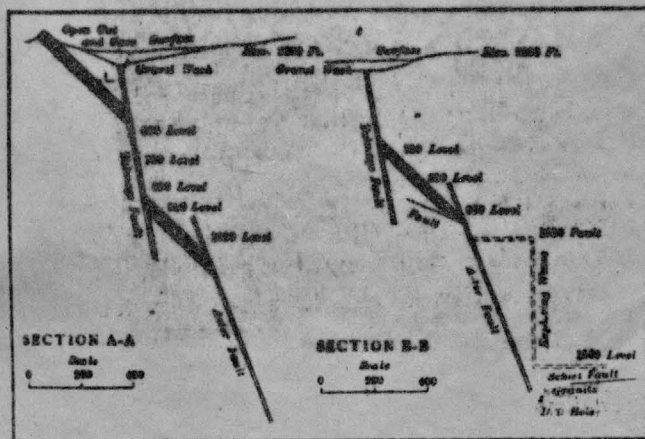


FIG. 2. CROSS-SECTIONS ON A-A AND B-B OF THE VULTURE MINE, SHOWING THE EFFECT OF FAULTING

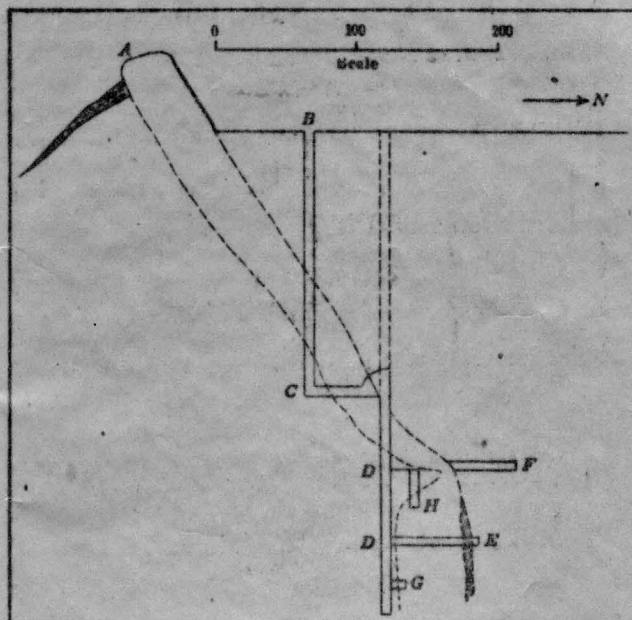


FIG. 3. SECTION OF VULTURE MINE

Drawn by Peter Taylor, superintendent, in 1872, published in report of the U. S. Commissioner of Mining Statistics, 1874, page 348. A, outcrop; B, mouth of main shaft at surface of mesa; C, 182-ft. level; D-D, interior shaft; E, crosscut at 232-ft. level, showing vein 47 ft. thick, with seam of clay on hanging wall; F, north property drift, at 232 ft.; G, crosscut (unfinished) at 312 ft. level; H, small winze.

in lenses a few feet in length, sometimes a foot in thickness, dark colored, and containing here and there crystals of galena. The calcite is comparatively plentiful near the surface and is not found in the deeper parts.

When the position of the fault was determined by the extension of the underground work, its apex was projected and staked on the surface, and it was found that it cut through an area of old dry-placer workings about 750 ft. southeast of the orebody. A working hypothesis was developed based upon the idea that the old placer marked the position of the faulted outcrop of the vein, and exploration was thereafter directed by a drift on the 750 level southeasterly along the fault and by a vertical winze from the same level on the northeasterly side of the fault. This work resulted in cutting the vein on both the 750 and 850 levels exactly where the hypothesis indicated. The orebody, when rediscovered, was 35 ft. thick, and the best part of the ore shoot 200 ft. long.

At this stage it was thought that nothing could interfere with the realization of the most sanguine expectations entertained for the mine, but before many months had gone by the Astor fault was cut on the 1,050 level, at a place where it was expected to find ore. This new fault is parallel, or nearly parallel, to the Talmadge fault, and the displacement is in the same direction—that is, downward on the northeasterly side. The amount of that displacement is not known, for the reason that neither the vein nor any other correlating features have been found beyond it.

The physical condition of the fault-filling does not suggest displacement greater than that of the Talmadge fault, but the winze 500 ft. vertically below the 1,050 level did not find the vein, although it did find stringers of quartz which yielded good assays, a condition which is characteristic of mineralization in the schists beyond the ends of the ore shoots. It is believed that the drifts might wisely have been carried further east before the work was stopped, but, in any case, if the vein should

now, the upper parts of the vein having been quarried in two large open pits. The westerly pit is 300 ft. long and the easterly one 500 ft., with low-grade vein matter, which consists mostly of white quartz too poor to mine, remaining between them.

In the oxidized zone the quartz is stained with iron oxide, and some wulfenite in characteristic tabular crystals with razor-sharp edges is found in openings in the quartz. Vanadinite is reported to have been found, but it must be rare, for none was seen during the recent operations. Below the zone of oxidation the vein minerals, other than quartz, are pyrite, galena, blende, and chalcopryite. The proportion of these is indicated by the ratio of concentration, which was about 30 to

extensive outcroppings of granite are found, occurring as an intrusive mass in the schist. The vein extends into the granite, but pinches out within a short distance after splitting up into several smaller veins, which have, however, yielded some high-grade ore. Granite of identical character was encountered in the westerly end of the 950 level, in the easterly end of the 1,550 level, and in a diamond-drill hole put down from the latter. These points of exposure of granite in the zone of mineralization indicate a probable easterly pitch of the contact and perhaps also an easterly pitch or rake to the ore zone.

The position of the stoped areas is shown in Fig. 1, representing the longitudinal section. Characteristic

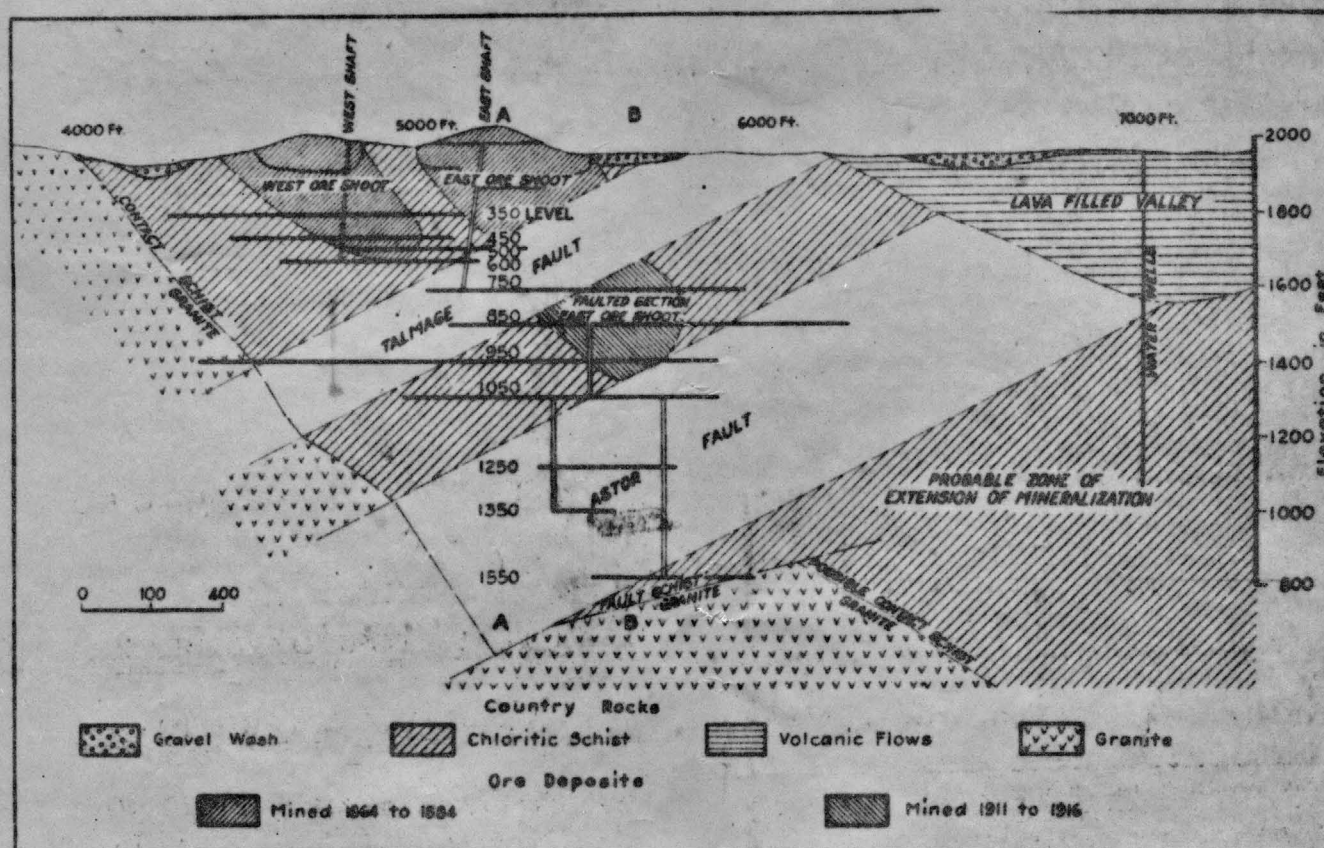


FIG. 1. LONGITUDINAL VERTICAL PROJECTION OF THE VULTURE MINE WORKINGS

1, and the assay of the concentrates, which was 12 to 15 per cent of lead, 8 to 12 per cent of zinc, 1 to 2 per cent copper, and from \$120 to \$200 in gold. Metallic gold was found in all parts of the mine, and even in the deeper workings, where the ore was not oxidized but was made up of characteristic quartz with associated sulphides, coarse gold was present, and thus some pieces weighing half an ounce or more accumulated in the mortars of the stamp batteries. This gold had a fineness of 760 to 780.

The association of gold with galena is an interesting characteristic. The gold thus associated appeared not to be metallic, and proved, upon experiment, to be peculiarly obstinate to cyanidation, but the galena was usually rich, so that when the average mill concentrates assayed \$150 per ton the clean galena concentrate assayed \$600. These characteristics of the ore led to the adoption of a rather unusual metallurgical treatment, a combination of amalgamation, concentration, and cyanidation.

Just beyond the ore shoot on its westerly extension

silicification is found throughout, but mineralization, instead of being uniform, is segregated in two well-defined ore shoots. The easterly orebody, which is the one furthest from the granite, was the larger in every dimension, and the position of the two suggests the conception of a succession of ore shoots *en echelon*. Thus, the next one should be further east and deeper, and the faulting would have carried it to some such position as is indicated on the drawing as "probable zone of extension of mineralization." Evidence of easterly extension of the ore zone would naturally be looked for on the surface, but near-by exposures are lacking, for the reason that the schists are buried by volcanic tuffs and lavas. The schists emerge again 3,000 ft. to the east, where they show characteristic structures and some mineralization.

The geological feature which has been a controlling factor in the history of the Vulture mine is the extraordinary development of faulting. There are a great number of small faults, with displacement, however, of a few feet only. These have been of little conse-



in 1865 built a five-stamp mill, which he worked steadily until 1867, when he sold the mine to an English company. The new owners built a new mill of forty stamps about a mile above the town of Wickenburg. Tailings in excess of 200,000 tons accumulated here from the ores hauled from the Vulture mine. The treatment at this early time was, of course, by amalgamation, and although the accounts refer to some concentration by bumping tables, it appears that the concentrates were not shipped away, but were piled up for future treatment. At any rate, after the cyanide process was



THE VULTURE MINE, SHOWING THE VEIN IN THE WEST END OF THE EASTERLY OPEN CUT

developed and in the early 90's, this tailing pile was worked over by cyanidation with great profit.

The ownership of the mine was divided, and this fact accounts for another mill of twenty stamps built in 1871 at a point on the river known as Smith's mill, ten miles east of the mine and fifteen miles below Wickenburg. There was a third mill at Seymour some time later, about three miles above Smith's mill and about the same distance from the mine and on the old stage road between Vulture and Phoenix. Frequent mention is made of the excessive cost of operation, due to the long wagon haul from the mine to these mills, which made it necessary to sort the ore at the mine and put into stockpiles for later treatment everything that yielded less than \$20 per ton. The practicability of building a mill at the mine and also of laying a pipe line from the Hassayampa River was considered early in the progress of the work. This plan, however, waited until 1879 for its realization, when the Arizona Central Mining Co. acquired all of the different claims on the deposit. An eighty-stamp mill was then built at the mine and a six-inch pipe line was laid from Seymour, whence water was pumped from wells sunk in the bed of the river. Power was provided by a steam plant burning wood, and during the operation of the mill, which continued for seven or eight years, all of the scanty growth of desert trees was cut off for twelve miles around the mine.

During the twenty years from 1888 to 1908, the mine was worked only in a small way by lessees. In 1908 it was reopened by the Vulture Mines Co. The mine was pumped out and the shaft sunk deeper. Milling began in 1909 from ore mined in the upper levels and milled in twenty stamps of the old mill repaired for that purpose. The ore was amalgamated in the mortars and on plates in approved California style, with very good results and a metallurgical efficiency of 70 to 80 per cent. The tailings were piled for later treatment by cyanide. Water was developed by the deep wells, and a new mill built in 1910. The latter was of twenty heavy stamps,

with supplementary grinding pans, having a capacity of 100 to 120 tons of ore daily, and was driven by a gasoline engine. The mill worked steadily, with the exception of an interruption of a few months, until the end of 1915. All activity ceased in 1917. The mine was allowed to fill with water, and in 1919 the equipment was advertised for sale.

Only the most meager records of the production of the Vulture mine between 1864 and 1908 are to be found, but it is known to be very large. Published reports credit it with as much as \$16,000,000, and some claims are made of even larger production. In *Mineral Resources* for 1869 a record is given of 15,474 tons milled at Wickenburg, which yielded \$399,743, which is at the rate of \$25.83 per ton. Whatever uncertainty there may be regarding early production, there is none concerning that since 1908, which amounted to a total of \$1,839,375, of which about 30 per cent came from concentrates shipped to smelters and the remainder was from bullion derived in nearly equal proportion by amalgamation and cyanidation. Complete records of tonnage are not at hand, but there was milled during the years 1912 to 1914, inclusive, 82,091 tons of ore of an average assay of \$18.94 per ton, which was treated with a metallurgical efficiency of about 82 per cent.

The mine is in the foothills of the Vulture Mountains at the edge of a broad, gently sloping desert valley. The country rocks are schists, probably pre-Cambrian, with dikes and irregular masses of granite, all antedating the mineralization. Vulture Peak, at an altitude of 3,500 ft. and five miles northeast of the mine, is a volcanic neck with radiating dikes whose prominent outcrops form striking topographic features. This neck and the dikes are assumed to have been the

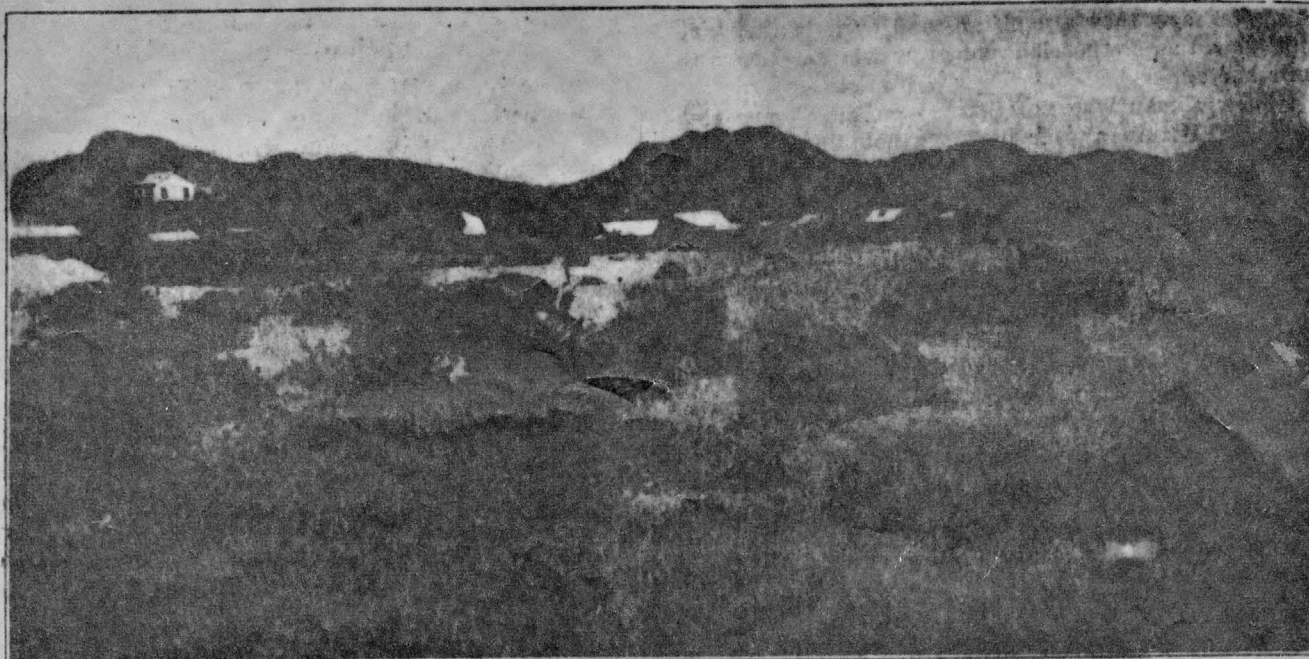


THE OFFICE AND ASSAY LABORATORY AT THE VULTURE MINE

These buildings date back to the very beginning, and are built of mine boulders, some of which show free gold. This picture was taken in 1908. The buildings are still standing.

source of the lavas which filled an old valley and buried the easterly extension of the Vulture mineral zone.

The vein strikes east and west and dips northerly 42 deg. It presents two characters: next to the foot wall, a vein five to six feet thick of rich mineralized quartz but without admixture of schist, and above this, and separated from it by chloritic schist, a big quartz vein thirty to fifty feet thick. In some parts this vein is of clean, white quartz, which is invariably low-grade and cannot be worked at a profit. In other parts, the body of this vein is made up of fragments of schist with quartz between, and is rich. The hanging wall is of chloritic schist, the foot wall being of sericitic schist. The outcrop was 1,000 ft. long, but it has all disappeared



THE VULTURE MINE AND CAMP, FROM THE MILL, IN 1914

## The Vulture Mine

An Excellent Example of the Effect of Faulting Upon the Development Of a Southwestern Gold Deposit—Discovered in the Sixties, the Property Had a Good Record of Production Until 1917, When It Was Closed Down

BY W. SPENCER HUTCHINSON

*Written for Engineering and Mining Journal*

**T**HE VULTURE, a gigantic tooth of gold-threaded quartz on the rim of the desert, watched century by century the seasonal migration of the Apaches, who crossed the mountains and the forty miles of desert between the waters of the Hassayampa and the Gila. In the sixteenth century it beckoned the adventurous Spaniard from the beaten trail to reveal its gold and to take his brass-poled and steel-edged axe for a token. It was not until 1862 that any attempt was made thoroughly to explore central Arizona; no one had before essayed more than a hurried passage through the country, although all believed it to be rich in minerals. The Territory of Arizona was organized by act of Congress, Feb. 24, 1863, and about the same time Weber, Walker, Wickenburg, and other veteran pioneers came into the district.

Henry Wickenburg, with several companions, was prospecting upon the Hassayampa in October, 1863, and discovered a butte or small isolated mountain of quartz which they recognized as containing gold, but to which they attached no great value at first, so that all but Wickenburg were reluctant to go to even the small trouble of posting notices, claiming the lode. It was, however, taken up, and the Vulture mine by 1867 became the best-known and most profitable property in central Arizona, if not in the entire territory. The main quartz outcrop, a tooth-like butte, was 500 ft. long, 400 ft. wide, and 100 ft. high.

The Vulture mine is in Maricopa County, fourteen miles south of Wickenburg, a station on the Prescott & Phoenix branch of the Santa Fé Ry. about fifty miles northwest of Phoenix. The mine is reached by auto-

mobile road, which surmounts a pass at an altitude of 2,700 ft., just north of Vulture Peak. The mine itself is at an altitude of 2,000 ft. It was not so accessible in the early days before the railways were built, when Ehrenburg, on the Colorado River, was the nearest supply point and whence all the machinery for the first mill was hauled 168 miles across the desert. In 1880 the railroad reached Phoenix and in 1893 it was extended to Wickenburg. The Hassayampa is a "dry" river the greater part of the year, but its sub-channel stream is unfailing, and at Wickenburg abundant water is found by shallow wells. Of these waters, it is alleged, "He who drinks thereof shall never afterward tell the truth, have a dollar, or leave Arizona."

The first mills for working the Vulture ore were built on the Hassayampa, one a short distance above Wickenburg, and sixteen miles from the mine, the other considerably further down the river and ten miles from the mine. Wells were drilled at the mine in 1909, and a watercourse in gravel was found under the lava at 400 ft. depth. Two wells were equipped with pumps, but the water nearly failed in 1912, and one of the wells was deepened to 1,003 ft., where more water was found. This water rises to 450 ft., whence it is pumped with a standard well rig, and for four years, as long as the well was used, the flow showed no diminution, and there was never any lack of water for the mill at the mine or for other needs.

Wickenburg himself seems to have been possessed of initiative, for within six months of his discovery he had built arrastras on the Hassayampa River, to which he hauled ore yielding \$80 to \$100 in gold per ton, and





of the fault zone, a 500 foot shaft and a small amount of lateral workings has explored a portion of the area. Two wells, one presently operating, would provide sufficient water for any foreseeable requirement.

POSSIBILITIES -

This property has two distinct possibilities.

(1) The development of an open pit operation on the main zone of the old workings. There exists the possibility of blocking out 20,000,000 tons of ore to a depth of 500 feet.

(2) The location of the extension of the ore zone to the east under the lava filled valley.

OWNERSHIP -

The present owners of the property are Messrs. Johnson and Turnbull who purchased the complete title to the property from East Vulture Mining Company in May 1959.



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#### GEOLOGY -

The Vulture Mountains are made up largely of andesitic and rhyolitic lavas which lie on schist and granite. Granite and rhyolite porphyry dikes are abundant. The Vulture Mine is near the southern margin of a moderately hilly pediment at an altitude of 2000 feet. This pediment is floored with quartz sericite schist, intruded by granite and rhyolite porphyry. Complex faulting has affected these formations. The Vulture vein system at the surface strikes slightly north of west and dips 45 degrees north. Gold occurs in mineralized quartz veins separated by sericite schist. The schist carried gold values. Widths up to 85 feet or more have been mined. Below the zone of oxidation the ore contains pyrite, galena, blende and chalcopyrite. Coarse gold was found in all parts of the developed mine.

#### DEVELOPMENT -

The workings extend downward through various shafts to 1550 feet west of a main fault zone. High grade ore has been removed to the 950 foot level. Portions of the ore zone to widths of 100 feet have been open pitted to a depth of about 150 feet. To the east

June 1, 1959.

THE VULTURE MINE, WICKENBURG, ARIZONA

LOCATION -

The Vulture Mine is on the southern margin of the Vulture Mountains about 9 miles west of the Hassayampa River and 14 miles by road southwest of Wickenburg, Maricopa County, Arizona. The present property consists of 12 patented claims, 14 claims ready for patent and approximately 70 located claims.

HISTORY -

The ore deposit was discovered in 1863 by Henry Wickenburg who treated rich portions of the outcrop in an arrastre on the Hassayampa River. In 1866 the Vulture Company of New York built a 40 stamp mill near the present site of Wickenburg and hauled the ore by wagon to the mill. Various other companies acquired and operated the property until 1917 and the records indicate that about \$6,800,000 worth of gold was extracted. In 1927 the Vulture Mining and Milling Company was organized and diamond drilling of the eastern extension of the ore obtained encouraging results. The United Verde Extension Mining Company became interested in the property and sank a 500 foot shaft in 1930. It was reported that underground results did not warrant U. V. X. to further participate in their agreement to develop the property. In 1931 the East Vulture Mining Company was organized and a 125 ton per day amalgamation and cyanidation mill was built. Feed for this plant consisted of old tailings and open pit ore west of the old workings.



4122 NORTH 56TH STREET  
PHOENIX, ARIZONA

June 25, 1959.

Mr. J. M. Pierce,  
President,  
Ranger Oil (Canada) Limited,  
505 Eighth Avenue Building,  
Calgary, Alberta, Canada.

Dear Mr. Pierce:

I visited with Mr. Wright in New York on June 19th, and went over the Lake-shore copper property and its possibilities with him in detail. He advised that he would be in touch with you concerning future developments.

At the same time, he requested that I forward to you some data on the Vulture property near Wickenburg, Arizona. I have obtained a sixty-day option to purchase this gold-silver property outright and have started a sampling program which will indicate whether a large open pit operation would be possible.

Yours sincerely,

Lyall J. Lichty

c.c. W. H. Wright