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The following file is part of the G. M. Colvocoresses Mining Collection

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Extract from Heller's Report - June 18, 1909.

*Copied*

Regarding the Mineral Hill properties neither the present ore showing nor the future prospects warrant its purchase or the expense of constructing a railroad. It can produce a limited amount of very profitable copper ores but the supply is uncertain and the property can only be considered as an auxiliary supply to what may be furnished by the Planet Mine.

Permission to inspect only a portion of the Planet Mine was given, - but what was seen in the lower workings of the property, immediately above the water level, indicates that the Consolidated Arizona Co. should take immediate steps to have the property thoroughly examined under option. The upper workings of the mine show a flat ore body of iron ore, practically barren of copper and so dry that on picking down it falls to dust and is thus worthless as smelter flux. Underlying this iron ore in the upper levels are some irregular patches of silicious ores, which, being neither high grade nor extensive are of little importance. But the developments in the lower levels show a decided improvement in the grade, extent and character of the copper and iron ore and indicate that the mine has a chance to be a large and steady shipper of fairly high grade ore. At a depth of about 800 feet down the very flat incline (being only about 280 feet from the surface vertically) three raises show a parallel flat vein, below the main iron vein, which is ten feet thick and is a heavy iron ore containing copper carbonate. If this newly cut orebody maintains its width and grade for any depth it will solve the iron flux question at the Humboldt Smelter. On account of the restricted permission granted to make this inspection, no average samples of this ore were taken, but it can be safely estimated that the entire width of 10 feet will assay four and one-half percent copper and carry an excess of about 30% iron (Fe) over its silica. The present three raises already show that this ore extends over an area of one hundred and fifty feet wide and one hundred feet on the dip, and there is a strong possibility that this deposit may continue on in depth and breadth for a considerable distance. It is a matter that can be easily and cheaply proven and when proven, it will be the very ore supply that the Humboldt Smelter requires for a profitable career. It should be noted however, that its existence and extent has not as yet been thoroughly proven. All that can be presently recommended is that the mine be unwatered and the property carefully examined with reference to the relation of this newly found body of ore to the future of the mine. If the examination shows that this orebody is likely to be continuous in the present workings and also likely to underlie the other iron ore bodies which are undeveloped in other portions of the ground held by this company, then purchase should be made of sufficient stock of the Planet Co. as will ensure this needed ore supply for Humboldt.

*From  
New No. 6 file*

*See Sketch of Shaft in  
Report "A"*

NEW PLANET  
VERTICAL SHAFT.

---

Depth of Shaft 350 ft.

We commenced sinking Sept. 1/09. Advance 65 ft. to 412 ft.  
No values in copper.

Advance 19 ft. to 431 ft. Gneiss foot-wall. No copper.

Advance 15 ft. No details.

Advance 24 ft. Barren foot-wall rock of somewhat altered gneiss was punctured and slight indications of water are beginning to show up in the bottom. The bottom of the shaft is now 73 ft. below the level of the water in the Bill Williams River at this time of low water.

Advance 28 ft. Report missing.

Advance 23 ft. Barren foot-wall of altered gneiss penetrated, about 300 gallons of water per day.

Advance 22 ft. Barren foot-wall of altered gneiss penetrated.

Total depth now 543 ft. Total length desired 547 ft.

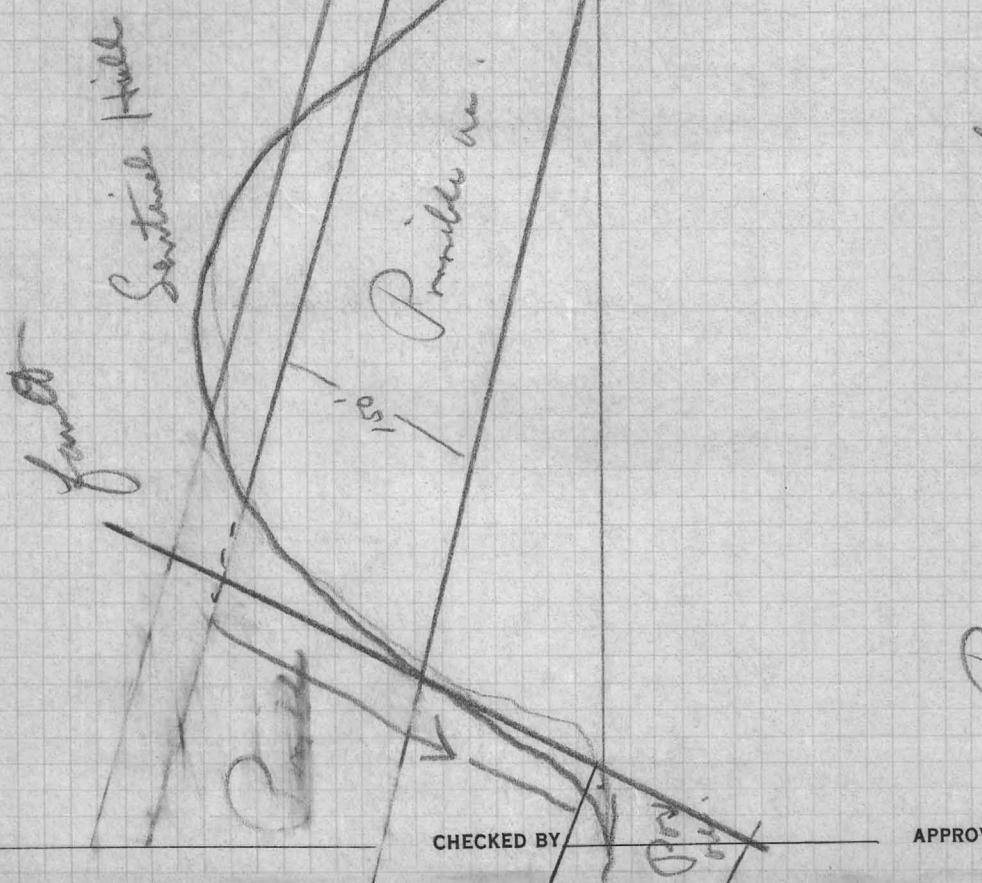
*Shaft from 170' to 350'  
shown on sketch  
accompanying Report "A"*

OFFICE OF  
**REPATH & MCGREGOR, ENGINEERS**  
 COMPANY \_\_\_\_\_ DOUGLAS, ARIZONA, \_\_\_\_\_ ACCOUNT NO. \_\_\_\_\_

COMPUTATION FOR \_\_\_\_\_

DATE \_\_\_\_\_

191 \_\_\_\_\_



Pavement low grade as body  
 3000' long X 600' wide X 150' depth = 270,000,000 cu ft, less existing  
 portion in grade  $\frac{70,000,000}{12} = 5,833,333$  = 16,500,000 cu ft.

3,500,000  
 20,000,000 cu ft @

Add Ellen Baker, Palms &  
 Chyffon Hill & Bendish

perhaps 1.5% or 5-1

S m c 1720

MADE BY \_\_\_\_\_

CHECKED BY \_\_\_\_\_

APPROVED BY \_\_\_\_\_

DRAWING NO. \_\_\_\_\_

Planet  
CLAUDE FERGUSON

R. 4/20  
Planet Mine,  
Bouse, Arizona,  
April 18, 1920.

Mr. G. M. Colvocoresses, General Manager,  
Humboldt, Arizona.

My dear Mr. Colvocoresses,-

Your night letter of the 14th was brought out to me on the 16th. I did not go into more detail in my wire of the 13th for two reasons: first, because I expected that you would be down here within a few days, and second, because I could not satisfactorily set forth the conditions exposed in unwatering, and, in addition, I was anxious to get some results from samples before attempting to say much about ore.

It has been very slow work getting started, both on the sampling and assaying, but I got my first batch thru today, and it will go much better from now on. Accordingly, I will go to Bouse tomorrow and send this letter, and wire you so that you will know that it is coming, in case you are still in Humboldt.

As to results to date:

In the first place, I found the bottom of the Incline about 100 ft. short of the point where I was led to expect it, as I indicated in my wire. I am therefore more puzzled than ever to reconcile the Heller report of 1909 with conditions as they actually exist. There is only one raise from the Incline which does not show on our map (the one DeCamp made), and it is about 50 ft. below the lowest raise on the right hand side of the Incline which does show on the map, and is the only raise that DeCamp and I did not get into before unwatering. I ~~had~~ thoroly cleaned down this raise, sides, top, and bottom, and took several samples; there is no ore in it. The best sample in it, across about 3 ft. showing a sprinkling of carbonates, ran 2.74% Cu. Wenceslaw thinks, and I am inclined to agree with him in opinion, that this raise is possibly too far to the north, and that there is a chance to get some ore of the regular type in the block of ground lying between this raise, the upper raise, and the Vertical shaft.

This opinion is strengthened by the fact that, on about this same level, there is ore showing both in the upper raise, and in the Vertical shaft. I have torn out the lagging for eight sets above the water level in the Vertical, and have got to the top on the so-called iron orebody. In the north end of the shaft, this comes in at about my 300 ft mark. So far, I have sampled this end practically down to the gneiss. The upper ten feet averaged 10.22%; the balance of it, practically nothing. So far, this is encouraging, as no lateral work has been done on this ore from the Vertical, and it is about 100 ft. from this ore showing in the Vertical to the point where, what I believe is the same ore, shows in the upper of the two raises above mentioned. However, we must bear in mind the spotted and buncy character of all this ore, and it may not look so good after I have finished sampling all four sides of the Vertical, as I intend doing. Sampling, to mean very much in this

Noted  
E.S.

(G. M. C., 4/18/20---2)

ground, must be more than ordinarily thorough.

So far, I have run only one sample from the upper raise. It was from a 2.5' face, and ran 10.10%. There are one or two other narrow faces in the workings from this raise that may go as well, and of course one cannot forcase whether, if followed, they will open up or pinch down, but I feel that there is a fair chance to get some ore between this point and the Vertical Shaft, and one of my first recommendations will be to drive a connection on this horizon.

I will not attempt to go into further detail in this letter, in view of your contemplated visit in the very near future, on which occasion, of course, much that is now vague will be clarified. I merely wanted to give you some general idea of the conditions as exposed by the unwatering, for your immediate information. One thing that can be almost definitely stated, from information so far obtained, is that there is no uniform body of copper-iron ore exposed, which, over any considerable extent, will average ten feet thick and 4.5% Cu. I will say, however, that my expectations of being able to open further kidneys of fairly high grade carbonate ore (such as have been mined in the past), especially in this lower part of the workings, has been somewhat strengthened by the results obtained to date.

I might mention further that Wenceslaw tells me that this upper raise is one of the places where the Wilson Leasers were mining ore at the very last. This is the raise that, as you may remember, DeCamp and I got into by wading thru water about 4.5 ft deep.

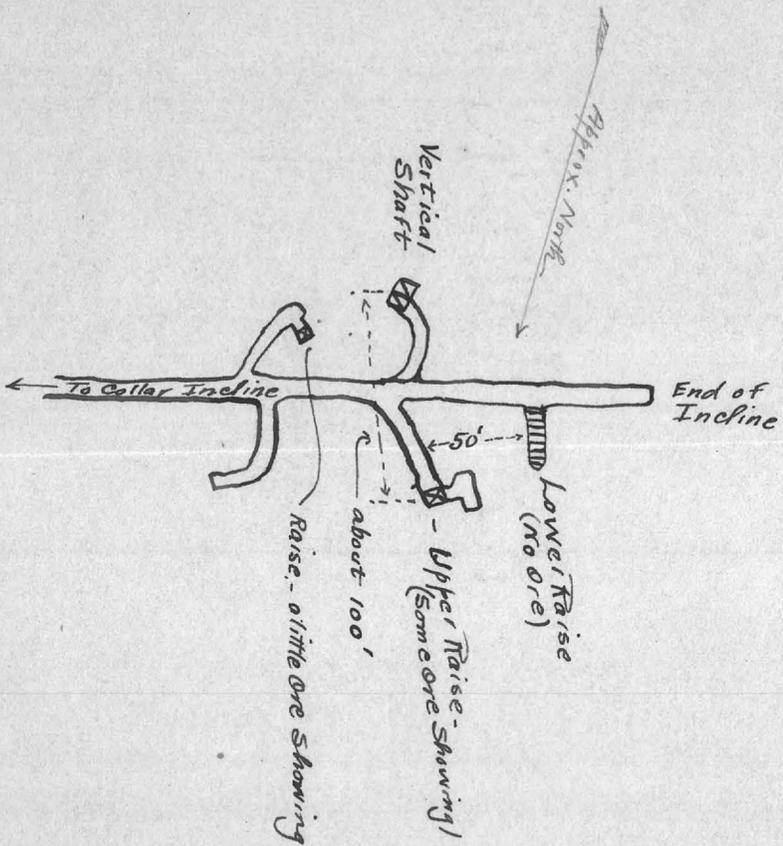
Have syphoned the water from the Vertical down to the gneiss. There is apparently no ore at or near the contact with the gneiss in the Vertical shaft, altho a short distance away, in the Incline, ore was mined close to the contact.

As to ~~the~~ other progress to date: you will be glad to know, I am sure, that Wenceslaw had agreed to do some work in the Ella Belle on a royalty basis. As you know, it is necessary to do some dead work here before any ore can be produced, but Wenceslaw is hopeful of being able to start taking out some ore about the middle of May. I have also some good prospects of getting some work started on a royalty basis at one or two other points; there is an experienced leaser, in fact, now on the ground with whom I am "dickering"; he seems to be well impressed with the possibilities here, and I think will take a chance. Once we get such work started, others will come in. It is slow work getting started, but I think the work will gather momentum as it goes along. I am inclined to give a fellow like Wenceslaw, for instance, fairly liberal terms to get the work started,--especially in view of the development work which he must do before he can hope to start mining ore,--and I feel sure that I share your own views in this matter. I will go more thoroly into details regarding the terms to him, as well as to other possible leasers, when you get on the ground.

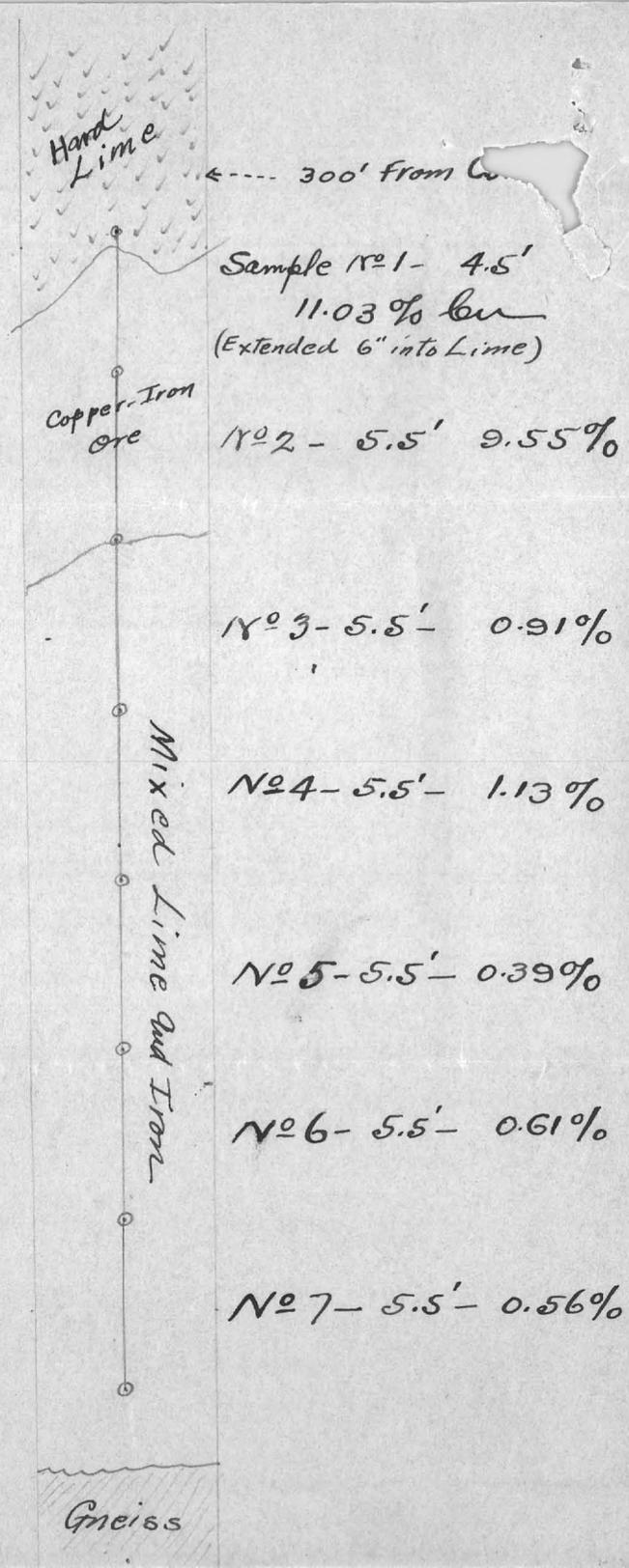
I trust that your trip has not been indefinitely postponed, and that we will see you on the ground during the present week.

Respectfully,





Vertical Shaft.  
North End  
(Vertical Section)



*Planet*

## CONSOLIDATED ARIZONA SMELTING COMPANY

### MINE DEPARTMENT

ALL COMMUNICATIONS SHOULD BE  
ADDRESSED TO THE COMPANY

Planet Mine.  
March 18 1920.

Mr G.M. Colvocoresses. Gen, Mg'r,  
Con's Ariz Smelting Co.  
Humboldt, Ariz.

Dear Sir:-

Mr Ferguson and I have just completed a very thorough examination of all the Planet Workings which included an inspection of the vertical shaft to the water level, the connecting drift from the shaft to the Main Incline and the raise to the north of the incline at the water level. Since this latter work at water level was done in water five feet deep it was not as careful or as complete as the balance of the inspections and it will be necessary to unwater the incline before this work can be properly done. The results of the general inspection I have considered in order of importance and they are as follows, though more detailed data will accompany my final report.

- 1 Possibility of immediate shipments from various points on property by Chloriders.

Since former leasers gutted all ore which was marketable at 28 cent copper there is little or no ore now available that can be handled on the present market and in any event the cost of this chlorided ore is from eighteen to twenty dollars a ton, as one man will seldom average in excess of five hundred pounds of ore per day. Cost's on this character of ore will be about as follows

Mining	\$20	Per ton
Haul	6	" "
Treat	5	" "
Freight	<u>3</u>	" "
Total	\$34.00	Per Ton.

With copper at 18.5 cents and a loss of 10 pounds it would therefore require an ore carrying 236#<sup>cu</sup>'s per ton to break even or twelve percent ore and there is no possibility of making even small shipments of this character of material.

The Ella Belle Incline however has an ore face exposed which according to former shipments will run, as broken, from six to nine percent copper. This ore is at water level or a few feet above and it is quite likely that this material can be roughly sorted at a total cost for mining and sorting of eight dollars per ton and an ore carrying in excess of eight percent <sup>cu</sup> obtained, which with an eight <sup>dollar</sup> mining cost and other costs as stated above should break even on eight percent, and it is quite likely that a grade in excess of this could be obtained resulting in a profit.

The Main incline is said by Wenceslaw to have a drift at the bottom showing from two to three feet of ten percent ore and since the cost of complete unwatering of this incline will be but little more than partial unwatering it is quite likely that some

# CONSOLIDATED ARIZONA SMELTING COMPANY

## MINE DEPARTMENT

ALL COMMUNICATIONS SHOULD BE  
ADDRESSED TO THE COMPANY

2 G.M. Colvocoresses. Planet Mine

of this ore if it exists could be handled at a profit since the mining cost would be low.

### 2 Immediate Work

First the unwatering of the incline during which time the property can be carefully sampled since a very careful inspection of the ore in the vertical shaft at the water level disclosed the fact that most of the copper value was due to finely disseminated copper glance. There is sufficient assay equipment on the property for this sampling and assaying. This sampling should be confined to the following points .

- Main Incline.
- Raises from Incline
- Vertical Shaft
- Sentinel Hill
- Ella Belle Workings from Incline

The time required for unwatering should not exceed two weeks and the unwatering and complete sampling should not require more than thirty days except in event of unforeseen difficulties.

This sampling is necessary and will give a very good idea of the various grades and tonnages of ore on the property which can either be worked now or later under a more favorable copper market and more favorable transportation. The eye sampling done here in the past is not at all conclusive and the advent of glance in some of the iron ore as stated above may mean that some ore has been overlooked by former operators.

To carry out the unwatering and sampling it will be necessary to make slight repairs to the road leading to the incline, install a circulating tank (now here) for the compressor engine, overhaul machinery, connect the air line which runs down the vertical shaft over thru the short drift at water level to incline, connect with a boiler feed pump which will discharge up the present water line in the incline. It will also be necessary to blast out a few rock on the main road to Midway. After pumping is actually started unwatering can be done in a few days.

### 3 Future Development

At the present time the incline and the Ella Belle workings present the best possibilities for future development work but more will be known when the complete sample report is in.

The ground above the present incline for its entire length in my estimation presents splendid possibilities for the development of new ore and this development could best be accomplished by driving incline raises from the side of the incline to the ore bearing beds lying above. The material from these raises could be delivered directly to the skip thus obviating all handling. Also there is a splendid opportunity for lateral development of ore from the incline after the sampling has been completed.

# CONSOLIDATED ARIZONA SMELTING COMPANY

## MINE DEPARTMENT

ALL COMMUNICATIONS SHOULD BE  
ADDRESSED TO THE COMPANY

3  
Mr G.M. Colvocoresses. Planet Mine.

### 3 Future Recommendations.

All Mechanical equipment such as compressor, engine etc, should be moved to the incline and the pipe thru the vertical shaft taken out and run down the incline. The 22 H.P. hoist should be set up at the incline and the 12 H.P. hoist there should be moved to the Ella Belle Workings. ?

The road from Planet to Midway is 16 miles long and the first 8 miles thru a canyon that will require constant repairs. Total cost of hauling at present time under contract will not be less than \$6.00 per ton.

There is an old road from Planet to Swanses which we went over very carefully and I estimate that \$1500.00 will place this road in splendid condition. Total length will be 11.2 miles and since grades are easy a hauling cost of not to exceed \$4.50 should be obtained. This road will require very little maintainence, an additional \$500.00 will be required to place a loading platform at Swansea and in the event of continuing operations on Planet for even a years time I should advise the work on this shorter road.

Some slight repairs will be necessary to present buildings .

Work has already been started on road repairs and the work should move rapidly as soon as material and supplies can be hauled to the power plant. There is a small pump here and no new and expensive equipment will be necessary to complete unwatering although a lot of small supplies, fittings etc will be required.

On My return to Humboldt I will give you a more detailed report covering occurrence of ore, possibilities for future production as I see them etc.

Expect to leave here for Parker this afternoon and will return after visiting the Empire and spend a day with Mr Ferguson.

Yours very truly,



P.S. Have talked with Mr Brace & Mr Shaw & believe there will be no further difficulty over moisture samples or weights.  
Struck 35' 6% ore on 600 level Swansea Mill heads now 3.2% Cu.

PLANET FILE

Kimball Hill, on Kimball Claim of Planet Company.

Jan 11th 1936

*The* A peculiar formation of brecciated rock lying on schist. ~~and~~ breccia is shot <sup>thru</sup> ~~there~~ with seams of hematite in conjunction with which there are occasionally found pockets of high grade gold ore which pan well.

Some development by tunnel and shaft which ran into schist at depth of 30' seeming to indicate that this was the thickness of the blanket of breccia which is said to have been thoroughly sampled by Hughes and E. L. Rossin and to have given an average of \$2.00 gold per ton while the schist average 80¢ per ton.

No large body of breccia indicated and in any event the values are too low to make this interesting.

J. h. c

*copy sent*

HARVARD UNIVERSITY  
MUSEUM OF COMPARATIVE ZOOLOGY

*R* 10/24

OFFICE OF THE DIRECTOR

CAMBRIDGE, MASSACHUSETTS

33

October 18, 1933

Mr. G. M. Colvocoresses  
Meteor Crater Exploration & Mining Company  
1108 Luhrs Tower  
Phoenix, Arizona

My dear Mr. Colvocoresses:

I have your letter of October 11 as well also as the circular letter sent out to all stockholders. " I shall continue to stick along as at present for the time being and hope that my doing so may be of some slight assistance to you. "

Very sincerely,

*T. Barlow*

$$F_2^{03} + /A.2.504$$

$F_2^{504} + 7\#20$  (Jimm suggest)

$F_2^{504}$  = Jimm suggest + - Jimm

Mr. Jimm suggest to conduct ~ 10 minutes

8 A.2.504.

Jimm suggest work on

a strategy

*Planet mine file*

*Planet mine*

Notes for H. H. Brown, Re Iron Ore.

Planet ore, several hundred thousand tons blocked out and accessible, mostly soft specular hematite  $Fe_2O_3$ .

Typical samples.

%	Fe	62	65.48	68.885	68.125
%	SiO <sub>2</sub>	5	7.00	0.435	0.890
%	P	0.03	0.031	0.031	0.051
%	S	tr			

The last two samples quoted are from a bed of black and specular hematite found in the mine and this type of ore should be ideal for your purpose.

Distance to Santa Fe. R. R. at Bouse *30 miles*, fair desert road. The Parker Dam will back up water in the Bill Williams River almost to the mine and it might be cheaper to boat it down to Parker.

SWANSEA MILL TAILINGS?

Perhaps 100,000 tons. Iron is specular hematite, tailings should all pass 60 mesh.

Average analyses.

Fe	57.8	58	61	60.6
Cu	0.13	0.10	0.07	0.07
SiO <sub>2</sub>	8.2	8.0	5.6	4.8
S	1.2	1.0	0.8	1.1
CaO	1.4	1.4	1.6	1.4

Distance from railroad at Bouse about *23* miles, fair desert road.

It might be hard to select the higher grade material and sample #2 had best be considered as the average.

2- H. H. Brown

SELIGMAN ORE.

Red Iron Oxide (Ochre)

Tonnage uncertain but probably over 150,000 tons. Upper portion could be mined from open pit.

Approximate Analyses.

Fe 61%  
SiO<sub>2</sub> ---2.5%  
CaO---5  
S ---0.2  
P. Traces.

Located 18 miles south of Santa Fe. R. R. at Seligman, fair road.

Mining would be cheap but some sorting might be necessary to bring ore up to the grade quoted.

Lower grade ore a very hard material is found in Many parts of the state, but these are the highest grade and softest iron deposits in Arizona, as far as I know.

PLANET FILE

Jan. 11th, 1936.

Kimball Hill, on Kimball Claim of Planet Company.

A peculiar formation of brecciated rock lying on schist. The breccia is shot thru with seams of hematite in conjunction with which there are occasionally found pockets of high grade gold ore which pan well.

Some development by tunnel and shaft which ran into schist at depth of 30' seeming to indicate that this was the thickness of the blanket of breccia which is said to have been thoroughly sampled by Hughes and E. L. Rossin and to have given an average of \$2.00 gold per ton while the schist averages 80¢ per ton.

No large body of breccia indicated and in any event the values are too low to make this interesting.

G. M. Colvocoresses

### PLANET MINE

(Note by G. M. Colvocoresses - Oct. 1937)

I had an option on this mine for the Consolidated Arizona and Southwest Metals Company from 1919 to 1923, during most of which period we were operating the Swansea Mine nearby. I have visited the Planet frequently from 1914 to 1936. Prior to 1919 the greater part of the high grade ore in the various veins had been mined out by the Company or by lessees and the Lewisholm Co. had been disappointed in their hope of developing a large body of primary sulphide ore under the oxidized iron and copper showing.

It appeared to me that there was still a chance of proving up a large tonnage of oxidized ore near the surface that might have been profitably treated by leaching or some other method and with this in mind I directed the investigations of Burnett, DeCamp, White and finally the very complete sampling which was made by McKnight in '23 as per his reports and the copies of his maps.

Results of all these examinations were unfavorable and I have been forced to conclude that the Planet can only be expected to produce small tonnages of carefully sorted ore which will only pay during periods when the price of copper is unusually high.

There is still a remote chance that extensive drilling or other exploration might disclose a large body of ore with depth but this did not appeal to such engineers as J. P. Channing, B. B. Gottsberger, W. F. MacLeman of the Miami Co. and it does not appeal to me, altho I think that the deposit is one of the most interesting and puzzling that I have ever seen

January 30, 1943

Mr. Thomas L. Chapman  
U. S. Bureau of Mines  
P. O. Box 4097 University Station  
Tucson, Arizona

Re: Planet Mine

Dear Mr. Chapman:

I looked over my file on the Planet and enclose copies of two additional reports which probably will not add very much to the data that I have already given you on this property.

The report by engineers of the Santa Fe concerning their proposed railroad and the mineral resources of the country in the vicinity of the Bill Williams River did not refer to the iron deposits at the Planet Mine since their investigation was confined to the country north of the river and the railroad line which they then contemplated building would have come down from Yucca and they made no provision for crossing the Bill Williams River.

At your convenience I shall be glad to have you return to me the blue prints and other documents concerning the Planet of which I did not have extra copies, but I shall always be glad to furnish you with any additional information in my possession.

Personal regards.

Yours very truly,

GMC:cg

*Returned to [Signature]*

May 10th, 1944

New Planet Copper Mining Company  
61 Broadway  
New York, New York

Re: Planet Mine

*File*

Gentlemen:

I beg to acknowledge your letter of May 3rd signed by your vice-president and referring to correspondence which I had with Mr. Hughes, General Manager of the Miami Copper Company, concerning a lease on the Planet Property.

The parties whom I represented in this matter inform me that for the time being they would not be interested in leasing the Planet Mine or any part since they have recently been experimenting with the ore from another mine which is more suitably located in respect to transportation and it appears to contain ore entirely suitable for their purpose.

I understand that no definite lease or purchase has yet been made of the other iron property, and therefore it may be that they will ask me to communicate with you again respecting the Planet, but I am not in position to request a lease at the present time.

I thank you very much for attention to this matter and for information concerning the thickness and grade of the iron as disclosed by recent drilling conducted by the Bureau of Mines.

Yours very truly,

*Ime*

GMC/b

# New Planet Copper Mining Company

61 Broadway.

TELEPHONE: BOWLING GREEN 7340

New York, May 3, 1944.

Mr. George M. Colvocoresses,  
Mining and Metallurgical Engineer,  
1102 Luhrs Tower,  
Phoenix, Arizona.

*Colvocoresses*  
*5/10/44*

Dear Sir:

Sometime ago you inquired of Mr. R.W. Hughes, General Manager of the Miami Copper Company, regarding a lease of some of the New Planet claims. Mr. Hughes referred your letter to us, and we have been delaying answering you until we secured some information as to the drilling being done by the Bureau of Mines. We are giving you below the only data we have received so far. They are drilling other holes, and, unfortunately, we do not know where they spotted the holes.

<u>Hole No.</u>	<u>Depth. ft.</u>	<u>Thickness</u>	<u>% Iron</u>
1	115 to 130	15	50.33
	185 to 195	10	42.54
2	95 to 120	25	42.85
	160 to 170	10	57.18
3	No ore		
4	67.5 to 72.5	5	42.51
	72.5 to 82.5	10	26.95
5	125 to 140	15	27.17
	140 to 175	35	35.02
6	337 to 352	15	28.18

Mr. George M. Colvocoresses:

May 3, 1944.

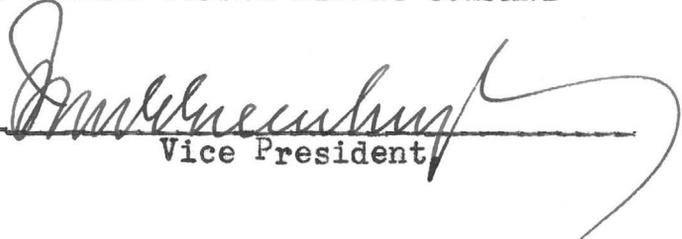
In view of the above, will you please let us know if you are still interested in a lease, what claims you are interested in, what tonnage you would expect to remove monthly, what royalty you would expect to pay, and how long a lease you would want.

Upon receipt of your advices, we will be in a better position to discuss this subject.

Yours very truly,

NEW PLANET COPPER MINING COMPANY

By

  
Vice President

HMT:HL  
NPCMC

Kaiser Co. Engineers estimated 2,500,000  
tons of iron ore in 1943

*copied*

DRI LL HOLES

NEW PLANET COPPER MINING CO.

HOLE #1

Total Depth 700'. From 215' to 295' in diorite. Only encountered copper in one sampling and that ran 4/10 of 1% copper. Went through a body of iron averaging 30' in width. Hole stopped at 700' as this is below bottom of shaft and found nothing but iron.

HOLE #2

Total depth 441'. Abandoned on account of having lost tools in the hole.

HOLE #3

Total depth 267'.

HOLE #7

Total depth 700'.

		Check assays made by <u>MR. GOTTSBERGER</u>	
1	-345	Gneiss 345'	:415-450 All less than 1% as follows:
345-415		Sand-	:415-420 0.98)
415-420 1.8%	)	stone 70'	:420-425 0.87)
420-425 2.6 )	)		:425-430 0.73) Gneissic coun-
425-430 2.4 )	)		:430-435 0.73) try rock contain-
430-435 1.5 )	)		:435-440 0.57) ing small string-
435-440 1.2 )	)		:440-445 0.59) ers of pyrite
440-445 1.9 )	)		:445-450 0.47)
445-450 1.3 )	)		:
450-455 1.4 )	)	Schist 65'	:640-645 None
455-460 Tr. )	)		:645-650 0.01
460-465 Tr. )	)		:650-655 0.01
465-470 .00 )	)		:655-660 0.01
470-475 .4 )	)		:660-665 None
			:665-670 "
			670-675 0.02

HOLE #7 - Continued

475-480	.06		
480-500	Tr.		Sandstone 20'
500-505	.2	)	
505-510	1.0	)	Copper Car-
510-515	.5	)	bonates )
			Quartzsite 15'
515-530	Tr.)	)	
530-545	Tr.)	)	
545-550	.6	)	
550-555	.5	)	
555-560	.35	)	
560-565	.27	)	Native
565-570	.11	)	Copper
570-580	Tr.)	)	
580-585	.0	)	
585-590	.5	)	
590-595	.23	)	
595-605	Tr.)	)	

Bottom of hole in dioritic iron and traces of copper. In panning churn drill samples found chalcopyrite.

HOLE #10

Total Depth 513'. The hole has been drilled through schist all the way to the present depth.

HOLE #11

Total depth 502'.

1 -335 Schist: no copper

335-355 Iron

355-306 Gneiss 380-390 trace of copper

390-395 contains some carbonate and cuprite, assay at mine giving 1.3% copper. Material called iron is not pure hematite but only iron stained schist.

Hole #11 Continued

395-502 Schist-

10 feet of iron and bottoms in clean gneiss. All samples showed copper except those from the last 30 feet. Highest assay obtained was 1.19%; the mineral is largely, perhaps entirely cuprite; Pyrite is found in nearly all the samples.

HOLE #12

230-340	.0	(22 samples)
340-354	.5	
345-350	.4	
350-355	1.1	
355-360	.6	
360-365	.3	
365-370	1.0	
370-375	.5	
375-380	.6	
380-385	.3	
385-390	.1	
390-395	.3	
395-400	.1	
400-460	None	

Upper part of hole is in schist. Near the bottom at 380' iron was cut and a little diorite shown in the sludge. A bed of hematite was cut at 360' and has a thickness of 10' to 20'. This lines up with the bed at Hole #11 but not with the one cut by Hole #10. 12 samples from 400' to 460' showed no copper. Hole stopped in gneiss.

NEW PLANET  
VERTICAL SHAFT

---

Depth of Shaft 350 feet.

We commenced sinking Sept. 1/09. Advance 65 feet to 412 feet.  
No values in copper.

Advance 19 ft. to 431 feet. Gneiss footwall. No copper.

Advance 15 feet. No details.

Advance 24 feet. Barren footwall rock of somewhat altered gneiss was punctured and slight indications of water are beginning to show up in the bottom. The bottom of the shaft is now 73 feet below the level of the water in the Bill Williams River at this time of low water.

Advance 28 feet. Report missing.

Advance 23 feet. Barren footwall of altered gneiss penetrated, about 300 gallons of water per day.

Advance 22 feet. Barren footwall of altered gneiss penetrated.

Total depth now 543 feet. Total length desired 548 feet.

*Planet*  
*To Johnson*  
*File*  
Planet Mine, Swansea, Arizona.

January 11 1923.

Mr. G. M. Colvocoresses, Mgr.,  
Southwest Metals Co.,  
Humboldt, Arizona.

Dear Sir:

There is very little news to report regarding the work here, and everything is going along satisfactorily. We have just finished sinking four pits in the Planet wash, the first pit being at the upper end of the likely looking wash material and the others lower down at intervals of from 150 to 200 ft. No. 1 pit showed some values all the way down to bed-rock which was encountered at 19 ft. Judging from appearances, however, only the first five or ten ft. will carry any appreciable amount of copper and I don't look for any high assays on these upper samples. Each sample was taken so as to represent five ft. vertically. We struck bed-rock at 14 ft. in No. 2 pit and the wash material was similar to that in No. 1 pit. The wash material at No. 3 pit was only ten ft. deep and no copper was found below the first five ft. The No. 4 pit was sunk 20 ft. in practically barren wash gravel, only the first few feet showing any copper. I had intended sinking another pit lower down the wash but hardly think it worth while now as the copper bearing material lies only at the surface.

I have completed a survey of the Smelter Gulch, Blue Bird, Palmetto and Nickerson workings and will start sampling here as soon as we have completed the East Sentinel Hill workings. It is my understanding that you do not care to have the Copper Hill workings included in this examination. Am I not correct in this?

The assay returns, as you have noted, continue to be low and irregular. I haven't started work on the assay maps as yet but the returns themselves seem to bear out the assumption that the values occur only in narrow veins and lenses.

I will write you again in the near future and advise you as to progress.

Very truly yours,

*H. S. McTear*

*Planet Mine, from Company Report  
July 1911*

IRON

The enormous iron capping which overlies the main copper bodies, averages from 20' to 30' in thickness and has been opened up in length for a distance of 3000' and from 300' to 400' in width. This iron is of peculiarly fine quality for fluxing purposes and Bessemer steel.

THE COLORADO FUEL AND IRON COMPANY examined these iron bodies in May, 1906, and their engineer reported that there was at that time several hundred thousand tons of iron blocked out, with a probable unlimited quantity and that it was one of the largest and purest deposits of high grade Bessemer iron to be found in the southwestern part of the United States.

The following shows the results of their analyses: -

Analyses made of the iron exposed in the main workings gave following results;

This same Company had previously made two analyses, obtaining the following results:

		1		2	
Iron	62%	Iron	62.42%	Iron	65.48%
Silica	5%	Silica	12.84%	Silica	7.00%
Phosphorus	.030%	Phosphorus	.018%	Phosphorus	.031%
Sulphur	trace				

The Colorado Fuel and Iron Company would have used 150,000 tons of this iron that year had the Planet Company been provided with railroad facilities. Dr. W. S. Ward, Mining Engineer (Statistician for the United States Geological Survey for the state of Colorado), was the engineer employed by the Colorado Fuel and Iron Company to examine the Planet property.

The iron body 20 feet thick, which was intersected in the sinking of the new shaft is about 450' distance from the workings which were examined by the Colorado Fuel and Iron Company and is the continuation in width of the same ore deposit.

Oscar. H. Reinholt, Mining Engineer (Superintendent of the Govt. explorations in the Philippines, 1903 to 1904), reported on August 25, 1906, that the "Planet Mine is capable of supplying the iron needed during the next twenty years, for the production of all the pig iron consumed in any form on the Pacific Coast, even allowing for a slight increase during that period."

IRON - cont. page 2

Herman A. Keller, Mining Engineer and Metallurgist, reports the following analyses from samples taken by him: -

Specular ore, black, from incline near face of iron drift, half way down:	Specular ore from iron drift half way down between face and east drift:	Black hematite, taken from the east drift half way in:
Iron 62.176%	Iron 68.885%	Iron 68.125%
Silica 9.280%	Silica 0.453%	Silica 0.890%
Phosphorus 0.022%	Phosphorus 0.031%	Phosphorus 0.051%

In addition to the high grade copper ores and pure hematite ores, the Planet Mine has an abundance of fluxing material (copper-iron ore) which is in great demand at the custom smelters within shipping distance of the property.

*Planet Mine file*

DISTRICT: Bill Williams or Swansea  
PROPERTY: Planet Mine. Twenty-nine (29) claims.  
LOCATION: On the South side of Bill Williams Fork, 12 miles from its junction with the Colorado.  
OWNERS: New Planet Mining Company, controlled by General Development Company of New York.  
DATE VISITED: November 2, 3 and 4, 1918. By J. L. White

NOTES:

Country rock; altered diorite with a limestone capping and hematite deposit on or near the contact. There appear to be a number of parallel faults. Strike about N. 30 deg. E. which forms gulches and exposes the contact in at least four places. The diorite is spoken of as gneiss, also true gneiss apparently shows at the bottom of some of the drill holes. Copper ore in the form of carbonates, silicates and oxides occur at or near the contact in both the iron and lime and can roughly be divided into iron ore and lime ore.

Beginning at the most northerly important workings a vertical shaft has been sunk on the Bill Williams Claim 548'. There are no crosscuts or drifts from it but it connects with workings of the Planet shaft at 350' depth; water below this point. Old records mention a contact of schist and lime at 170' and copper showing from 175 to 185'. Where the lagging has been pulled down it does not look favorable.

The lime at about 230' showed copper carbonates down to 254'. The lagging has been pulled for three sets and some good carbonates show in blotches. Samples 2, 3 and 4 were taken here, No. 2 being the lowest exposed copper and No. 4 the highest. Nos. 2 and 3 represent 9' in the vertical cut; No. 4 represents 3 feet vertical cut, 2' above No. 3.

#2: 2.88% Cu. ; #3: 3.20% Cu. ; #4: 2.12% Cu.

400' northeast in the gulch is the collar of the No. 1 or Planet shaft. This is an incline, the first 50' about 60 degs. and the balance of 650' at 12 deg. southwest and over 2000' of drifting has been done here. On the 50' level there is about 1000' of drifting, mostly on the Mark Hanna Claim and for nearly its entire length it is in specular hematite. Numerous empty stopes near the shaft show here a large amount of ore was extracted. A few small pillars are left supporting the shaft.

Below the 50' level for about 200' there are open stopes showing where ore had been broken. Between the caved material, from the back, and waste sorted in mining, the stopes are partly filled.

The lower end of the shaft is in water but it is said that ore was being mined from this point at the very last. Ore from this incline was of the iron ore (copper) type. Sample No. 1 is typical of this ore except in copper content.

No. 1. 2.56% Cu.

Following Smelter Gulch north on the west side is the Ashly Glory Hole, a large open cut in a cliff of lime, from which a large tonnage of lime ore (copper) was shipped.

The Glory hole is about 200' long and has extension of lime showing carbonate that adds over 100' more. The thickness of this lime is difficult to determine but must be at least 50'. As this ore was sorted, the workings are nearly filled with sorted waste. Carbonates show and might be mined at a profit. This point was also

worked to the last moment by the leasers. Samples 5 and 6 are grabs of the dump.

#5: 2.76% Cu ; #6: 2.44% Cu.

Across the gulch is the Sentinel Glory hole, now caved. Ore of the iron type was mined here and old workings under the gulch come very close to Shaft No. 1. These workings are inaccessible. Above and to the south on Sentinel Hill are the Sentinel workings. Lime ore was mined here and was very similar to the Ashly Glory Hole except that the lime deposit and ore was smaller. Some ore remains. In one of the highest workings a stope of three or four thousand tons of iron ore was mined. This ore seems to have been mined very slowly. Samples 9 and 10 represent dump grabs from the lime ore.

#9: 1.72% Cu. ; #10: 3.96% Cu.

In the gulch and farther north are the Ella Belle workings. An inclined shaft opens into several good sized stopes, from which ore of both characters has been mined. The ore has been faulted here and there is a chance of picking up the body a little lower. Water has been encountered here, which discouraged sinking further. The bottom of the incline is dry at present.

The next gulch East exposes the contact at the Blue Bird workings. Very little ore of commercial grade was mined here. The next gulch East has the Palmetto workings, which are in bad shape at present but have a record of having produced some very good ore at the earliest times. The last ore exposure East is the Copper Hill, which is a lime capping which at one time had some narrow seams of very high grade carbonate ores and most of them have apparently been mined.

The Planet Mine was opened and worked many years ago. Records in 1884 show pig copper production. Ore was also mined and packed to the Colorado River, where it was shipped by water to the Gulf of California and from there went in ballast to Wales to be smelted. This method of handling proving unsatisfactory, shipping ceased and Mr. A. P. Jones held the property for many years, doing considerable development work meanwhile.

The New Planet Mining Company was formed and later the Lewisohns of New York obtained control. Several drill holes were put down and Shaft No. 2 was sunk to its present depth. The assumption was then that there might be a large body of sulphide copper ore at depth west of the carbonate showings. Drill holes showed copper carbonate at points, also chalcopryrite in one hole, with native copper in the gneiss at the bottom.

The property was later leased to A. P. Jones, who sorted the Sentinel Hill dump and shipped ore. In November, 1915, the Northwestern Leasing and Development Company took a three year lease and operated about two and a half years, shipping as much as 1400 tons per month. These leasers have gutted the property and there is very little ore in place, that is, ore of 5% or better. Apparently the property has produced something like 50,000 tons of ore, 7.5% or better.

Many of the old dumps were shipped; ore of 4½% grade was handled from them and 1500 tons of slag from the old smelter were also shipped. The dumps probably have a lot of lower grade ore in them and there is ore in place of a lower grade.

Starting in a small way, 8 or 10 tons of per per day could be mined and this could probably be increased shortly. This ore would be better than 10% but the margin of profit would be small. The truck haul to Midway on the Arizona & Swansea RR would cost from \$6.00 to \$7.50 per ton probably. The last rate was \$4.50 in 1917, where a big tonnage was contracted for. The mining would be very expensive, as 1000 pounds per shift would be larger than the average.

Chloriders or sub-lesers could probably produce quite a lot of ore and I believe this is the only way that the property could be handled at the present without expending much money at the start. It is the way the Leasing Company operated for the last year of their work.

Development work and very close sampling may expose some ore bodies. The carbonates in lime in the No. 2 shaft should be thoroughly gone into if any development work is to be done. Close sampling of what is left in the No. 1 shaft and unwatering it would be advisable. The Ashly Glory Hole could produce ore at the present, also the lime capping on Sentinel Hill. The Palmetto and Ella Bella should be closely investigated also. There is little promise of any considerable tonnage.

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*basic & siliceous*

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The lime at about 230 feet showed copper carbonates down to 254 feet. The lagging has been pulled for three sets and some good carbonates show in blotches. Samples 2, 3 and 4 were taken here, No. 2 being the lowest exposed copper and No. 4 the highest. Nos. 2 and 3 represent 9 feet in a vertical cut; No. 4 represents 3 feet vertical cut, 2 feet above No. 3.

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	% Cu.
No. 2.	2.88
No. 3.	3.20
No. 4.	2.12

	% Cu
No.1.	2.56

## Notes on Planet Mine (Continued)

	% Cu.
No.5 -	2.76
No.6 -	2.44

The Glory hole is about 200 feet long and has extension of lime showing carbonate that adds over 100 feet more. The thickness of this lime is difficult to determine but must be at least 50 feet. As this ore was sorted, the workings are nearly filled with sorted ~~waste~~. Carbonates show and might be mined at a profit. This point was also worked to the last moment by the leasers. Samples 5 and 6 are grabs of the dump.

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	% Cu.
No.9 -	1.72
No.10-	3.96

Above and to the south on Sentinel hill are the Sentinel workings. Lime ore was mined here and was very similar to the Ashly Glory hole except that the lime deposit and ore was smaller. Some ore remains. In one of the highest workings a stope of three or four thousand tons of iron ore was mined. This ore seems to have been mined very slowly. Samples 9 and 10 represent dump grabs from the lime ore.

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Notes on Planet Mine (Continued) #3.

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V. L. Hunt

REPORT OF EXAMINATION OF THE PLANET MINES

By A. Burnett, Dec. 17th, 1918.

What is known as the Planet Mine, consists of 39 claims, in one group, situated on the South side of the Bill Williams River, some 12 miles from its junction with the Colorado River. It is most easily reached from the South by auto from Bouse via Midway, the latter a siding on the branch railroad connecting Swansea with Bouse.

Without going into great detail concerning the early history of the property, the following notes may be of interest.

The first locations were made in 1864, from which date various quantities of ore were mined and shipped via the Colorado River to Wales. In 1884 the Mathilde Gold and Copper Mining Co., then operating in the district, brought in and operated a small circular blast furnace. This smelter was not a part of the property, but was rather a custom smelter erected on the property. This smelter operated from May 24th to Oct. 3rd, 1884, practically continuously but with frequent periods out of blast. A record at the property gives the following information, namely:

<u>Date in Blast</u>	<u>Tons of Ore</u>	<u>Copper Made</u>
May 24th - June 10th	378	47,734 lbs.
June 11th- July 9th	---	-----
July 10th-13th and 21st to 29th	389	69,061 lbs.
Aug. 1st - Sept. 14th	---	-----
Sept. 15th - Oct. 3rd	367	86,041 lbs.
Total	1134	202,836 lbs.

The above averages 9.0% in copper, and from the slag produced, which was shipped to the smelter within the last few years, it is stated a further recovery was made of better than 5.5%. The grade of ore charged to the furnace must then have been of the order of 14.5% in copper. Meanwhile, the better grades of ore were shipped to Wales, but gradually these shipments failed and the property became idle, assessment work was not continued and a number of the claims were relocated by one named Augsdahl, who developed further ore bodies and worked in a desultory way for some time. Finally in 1902 the property was sold by Augsdahl to J. Stanley Jones for the sum of \$30,000.00. This gentleman formed the Planet Co., and with some of his friends, instituted a development campaign, this being a continuation of about a year of development by himself personally. From 1902 till 1908, practically all the development of any note was done, this including the sinking of the Incline and Vertical shafts, the latter to a depth of 325 feet, where it connected with the Incline shaft through a short drift.

The personnel of the Company seemed to be men of standing, who really desired to develop the property into a mine. One of these, Mr. Wm. G. Nickerson, of Boston, commissioned Mr. Herman A. Kellar to examine the property in his behalf, which report was later given the Planet Co. In the report, which is dated June 11th, 1907, the statement is made that there are 10,200 tons of ore blocked out in the Incline, assaying 5.9% copper, a further 1400 tons on the dumps, and 2000 to 2500 tons assaying over 8% copper lying all over the property. The average width of the ore is stated to be 4 feet 3 inches. A. P. Jones, brother to J. Stanley Jones, states Mr. Nickerson put \$25,000 into the original Planet Co.

#2 - Planet Report.

J. Stanley Jones was the moving spirit in the Planet Co. and his death in Chicago Dec. 29th, 1908 seemed to disorganize matters. His brother, A. B. Jones, had been living at the mine for some years and having inherited a small interest in the property on the death of J. Stanley Jones, he continued to live at the mine. In June, 1909, the property was visited by Harvey Weed, on behalf of the General Development Co., and following negotiations, the New Planet Co. was organized. Of the capital stock of eight hundred thousand shares of \$5.00 par, the old Company shareholders received two of the new for one of the old. Four hundred thousand shares of the New Planet Co. remained in the treasury, and some hundred thousand shares are now in possession of the General Development Co.

Following the organization of the New Planet Co. a drilling campaign was commenced and carried out by the General Development Co. for about a year, when expectations not being realized, the property was abandoned in so far as further work was concerned, in August 1910, from which date the property remained idle.

In March, 1915, A. B. Jones secured a three year lease from the New Planet Co. and in the six or seven months following shipped part of the dumps from former development. Inability to handle the situation induced him to relinquish his lease to the North Western Leasing and Development Co. or rather to relinquish his rights in his lease, upon payment to him of Eight Thousand Dollars by the North Western Leasing and Development Co. This latter concern secured a lease on the property directly from the New Planet Co., for a period of three years from October, 1915, and it was during their tenure of this lease that practically all the ore developed by the old company for the six years from 1902 to 1908 was mined and shipped.

The text of the above is largely from information given me by Mr. A. B. Jones, now resident upon the adjoining property, known as the Argus.

In view of the existence of Mr. Kellar's report, showing the probability, amounting almost to a certainty, of a profitable body of ore ready for mining, together with the information the General Development Co. must have had, it seems strange that this ore could have remained unmined for so long, particularly as so little capital would have been required to immediately start shipments. Development was complete, and in all the North Western Leasing Co.'s operations, practically no development work was done, and very little new ore looked for. The object seemed to be to simply extract whatever ore was shown, make certain an immediate profit, and risk nothing whatever in further search. In this they were successful, as any further ore bodies of any extent must be searched for and developed. On the other hand a number of faces have been left which are capable of producing in a small way, to which reference will be made later.

The only maps obtainable at the time of this examination were two, one on a scale of 1" to 600', showing the claims as a group, the other a tracing of the Incline and drifts therefrom to a scale of 1" to 40' on the Bill Williams claim, together with some of the openings on the Ashley and Sentinel Hill claims. For this reason this report must be largely a description to be used with whatever maps may be available later, or that may be made from surveys.

The general geology of the property is apparent from the number of gulches crossing the ground, and shows a mass of Diorite as underlying the ore. With the exception of local dips,

### #3 - Planet Report.

waves or folds, this mass of Diorite forms a plane surface, continuing the foot wall of the ore bodies, or rather of the material in which these latter occur. This mass dips to the Southwest at an angle approximating 15 degrees from the horizontal. Above this there occurs a lime formation, through which are large masses of hematite, and in one place at least, namely on the Bill Williams claim, a crystalline schist overlies this lime. The ore bodies are found in the lime formation, and generally speaking occupy several horizons therein, these horizons being essentially parallel as well as being referred to the Diorite as a base or datum. In the Incline on the Bill Williams claim, the continuity of the lower horizon is remarkable.

The lime formation is of the order of some 200 feet in thickness and is replaced in an irregular manner by hematite. In places this replacement has been so extensive and regular that large masses of a fine grade of iron ore has been produced. Sometimes this iron will be in contact with the Diorite, or again it will occur as tongues varying in thickness and width, with lime both above and below. Though the iron is more or less parallel to the underlying diorite, it does form folds within the lime similar to an anticline, these folds being limited by the replacement of the lime rather than by movement within the lime itself. A very good example of such a fold can be seen in the Sentinal Hill workings, where in a stope almost vertical the wall of iron remains, this iron limiting the stope and ore at this point. Also in the Ashley Glory Hole, one leg of such a fold is to be seen, the iron here also limiting the stope and ore, and as is apparent from openings below the Ashley, this iron continues its downward course, gradually flattening out as it approaches the diorite, at which point it is but a few feet above the latter.

The occurrence of tongues of iron penetrating the lime gives a condition where the iron will be above the lime in one place and below the lime in another place, and where folds occur, to one side or the other respectively. Thus there are produced in the lime formation itself, an indefinite number of contacts between the iron and the lime, the general habit of these being parallel to the foot wall, though not necessarily so on account of the folds. These contacts are known locally as "Breaks" and their influence is very marked on the extent and richness of ore bodies.

A number of faults cross the property. One of these is the cause of a gulch, known as Smelter gulch, where the throw of the fault is of the order of some 300 feet. With a strike of about North 30 West, this fault cuts the outcrop, which on the East side of the fault or gulch is but a few feet above the wash, whereas on the west side of the gulch, the outcrop is several hundred feet above the wash, where it is the outcrop of Sentinal Hill on the East side of the latter. Beyond this one displacement, these faults do not seem to have had any influence on the ore, excepting in one place on the Ella Belle claim where a secondary fault has displaced an orebody, or at least cut it in two. In this one instance only, there was occasion to study the faulting to find the continuation of the ore. The further consideration of the faulting in its relation to the orebodies need not enter into this report.

In describing the property, particularly as very incomplete maps are available, a start will be made from the mine office. Two gulches, namely Smelter Gulch and Planet Gulch, meet some few hundred feet East of the office, from which point the former has a general southeasterly trend, the latter a southwesterly trend. These two gulches form the boundary of the Ella Belle and Sentinal Hill claims, the former on low ground near the

#### #4 - Planet Report.

junction of the gulches, the latter on higher ground and farther south. The Ella Belle outcrop being on the side of the fault which has dropped, is close to the wash, whereas the Sentinal Hill outcrop is on the side of the fault which has been lifted. Proceeding southwesterly along Planet gulch, the Ashley workings are to the West, the Sentinal Hill and Ella Belle to the East and the Bill Williams to the South. On the latter claim, two shafts have been sunk, No. 1 being an incline, and No. 2 a vertical shaft.

#### NO. 1 SHAFT.

This shaft for 70 feet is on an incline of about 60 degrees to the southwest, where it flattens out to about 15 degrees and continues in the same direction a further distance of about 500 feet where it connects with the vertical shaft No. 2 at a depth of 310 feet in the latter. At this level water prevents further access, but the incline is stated to continue some distance beyond this. At varying drifts in the incline short drifts have been driven both North and South, and from these drifts, the bulk of the ore shipped since 1915 was mined, but it is to be observed that the stopes in the upper part of the incline are larger and seemingly more regular than those lower down. At some 70 feet from the surface, a long drift has been driven in a southerly direction a distance of some 600 feet. This is known as the "Iron Drift" and for practically its entire length it is in solid, barren Specularite. At its extreme South end, however, it passes through a contact with lime, a "Break" and a little copper carbonate is exposed.

#### NO. 2 SHAFT.

This is a vertical shaft on the Bill Williams claim, some 580 feet Southwest of No. 1 shaft. At about 200 feet from surface it penetrates some 12 to 15 feet of copper bearing ore of low grade, and after passing through a barren schist, it again penetrates some 15 feet or thereabouts of copper bearing iron ore, the lower part of which is in water, the lowering of which by 4 or 5 feet would give access to the incline from No. 1. shaft through a short drift.

#### ASHLEY GLORY-HOLE

This working is on the West side of Planet gulch, some 300 feet Northeast from No. 1 shaft, and is a direct continuation of the ore bodies in the incline itself. Directly opposite the Ashley and on the East side of the gulch are openings on the Planet claim, and above the latter and farther North and East, the workings on Sentinal Hill claim.

On the Planet claim, three distinct horizons of ore are to be observed, from all of which ore has been mined. The lowest of these can be reached by a number of shallow shafts, connected by drifts below the surface of Planet gulch. The ore on this horizon is narrow and lies very close to the diorite, and parallel thereto. The continuity of the formation from one side of the gulch to the other without a break of any kind, shows Planet gulch to have been due to causes other than faulting. The middle and upper horizons are some distance above the gneiss or diorite, and have produced considerably more ore than the lowest one. Their connection with the Ashley stopes prior to the cutting away of the gulch is clearly seen.

Sentinal Hill is characterized by an extensive iron capping, in which copper ore occurs in more or less irregular masses, and away from any contact with the lime, but as the outcrop is followed around to Smelter gulch, lime is again to be observed. The contact of the lime and iron here as in general throughout the mine has produced ore of shipping grade.

#5 - Planet Report.

The Bluebird, Palmetto, Ella Belle and Copper Hill claims have all produced ore, and no doubt are capable of producing more. Their description, however, would extend this report unduly, but beyond the fact that they will add to the production of the property, they have but little bearing on the general situation excepting in one particular, namely, the lateral extent of the ore bearing zone, measured at right angles to the direction of the dip, i.e. along the strike. This distance, as measured from the workings of the Ella Belle to those of Copper Hill, in a general East-West direction, is of the order of some 2500 feet. It is reasonable to assume that a similar distribution may be expected upon development from the lower levels of the incline shaft No. 1.

Albeit there are many openings on the property, there is but little information to be gained from sampling. Even a thorough sampling, which would be a matter of considerable time and labor, would add but little to the information to be gained from a close inspection, for the reason that the assays of these would represent the value of the present faces. A small tonnage might, however, be blocked out, though it is reasonable to suppose the last lessees did not overlook any ore that could be easily mined without further development. It is known as a positive fact that a great deal of ore has been shipped from the property, and further that the sorting of this ore was in large measure necessary to maintain a shipping grade. As a guide, however, a number of samples were taken and copper determinations made on the ground, namely:

Sample #	% Cu.	C.A.S. Co. Assay							
		Oz. Au	Oz. Ag	% Cu	% Insol	% Fe	% CaO	% S	
<u>Sample #1.</u> From a pillar in a stope near the top of the incline from No.1 shaft, 2 cuts 8' each.	3.8	Trace	Trace	3.68	17.0	46.2	---	3.1	
<u>Sample #2.</u> From bottom of drift (inclined) beyond site of sample No.1, 2'	3.1	Trace	Trace	4.36	29.4	36.4	---	3.5	
<u>Sample #3.</u> From face 40' west of #2, 2'	1.4	Trace	Trace	6.34	13.8	49.0	---	5.3	
<u>Sample #4.</u> From face beyond #3 High in iron, 3'	6.6	Trace	Trace	1.36	63.8	13.4	---	3.3	
<u>Sample #5.</u> From bottom of drift (inclined) beyond sample #4, mixture iron and lime, 2½'	4.6	0.01	Trace	3.28	46.2	26.0	---	2.1	
<u>Sample #6.</u> East side of incline near bottom, contains considerable iron, 6'	3.9	0.02	Trace	4.00	14.2	48.8	---	5.9	
<u>Sample #7.</u> In drift to East of incline, in lowest accessible part of same. Considerable iron, 2'	1.7	Trace	Trace	1.76	56.0	22.8	---	0.6	

*Burnett's Assay*

#5 - Planet Report.

	% Cu.	C A S Co. Assay						
		Oz. Au	Oz. Ag	% Cu	% Insol	% Fe	% CaO	% S
<u>Sample #8.</u> Grab sample of fines off South dump on Ashley claim, being reject from ore sorted from Ashley-Glory Hole	3.7	Trace	Trace	3.56	40.7	17.2	9.0	Trace
<u>Sample #9.</u> Grab sample of fines off North Dump on Ashley Claim, being reject from ore sorted from Ashley-Glory Hole	4.3	Trace	Trace	4.04	40.6	14.0	10.8	Trace
<u>Sample #10.</u> Grab sample off dump, being rejects from ore sorted out of iron taken from No. 2 shaft, representing the body of ore encountered immediately above the intersection of the shaft with the incline	4.6	Trace	Trace	4.44	24.4	44.4	---	Trace

(It appears that the samples have gotten mixed in the Humboldt Laboratory and that Humboldt samples Nos. 3 and 4 are interchanged with Burnett's samples, Nos. 2 and 5.)

The work undertaken by the General Development Co. seems to have had for its object the exploration of the ground west of the Vertical shaft No. 2. For this purpose a row of churn-drill holes were put down some 800 feet West of the No. 2 shaft. The latter was also deepened to 543 feet, and at that level, a drift driven almost due West a distance of about 900 feet, in diorite its entire distance. They then raised about 100 feet and intersected the lime formation, where it is stated a very little ore was encountered. Although the object of this work is clear, it appears strange that they did not continue the sinking of the incline from No. 1 shaft, which could probably have been done at less cost, in less time and of greater importance in the ore zone. From such development, raises at moderate height at intervals would have prospected some 800 feet or more of ground which may be ore bearing. The drill holes give data which indicate that no large bodies of ore may be expected, but in this, they simply bear out conclusions which would be gained from an examination of the upper levels.

Conclusions.

From the fact that ore occurs at many places along an outcrop over a distance exceeding 2500 feet, it is probable somewhat similar conditions will be met with at depth, particularly as my examination of the ore bodies in the incline fails to show any fault or fold which would suggest these ore bodies having been concentrated along the incline, to the impoverishment of the ground on either side. While it is true that the ore from the surface openings may be expected to be of higher grade than that from the lower levels, in fact this was the case, there still remains a large area on either side of the incline, where ore equally as good as that from the incline itself may be expected. As a guide to such exploration, openings should be confined as much as possible to the contacts between the lime and iron. Bearing in mind the irregularity in boundaries and distribution of the ore bodies so far known and mined, the development of more further such bodies must be more or less of a speculation. On the other hand, the continuity of narrow stringers beyond the present faces of the stopes indicates the possibility of their opening up into bodies of ore which will be profitable.

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In planning a campaign of development, it would be well to explore by means of a number of raises, the ground now opened up in the incline, at the same time investigating an exposure of ore in No. 2 shaft some 220 from surface, this exposure being possibly the southwestern extension of the orebodies that have been mined from the Ashley, which, should it prove to be the case, would probably yield a large tonnage of ore which would by sorting yield a profit.

Contemporaneously with the above, it would be advisable to unwater the incline for inspection, and either above or below the present water level drift to the southeast whatever distance developments might warrant, raising at intervals to explore the higher horizons.

Also at the junction of the Vertical Shaft with the Incline, the body of copper bearing ore should be explored, as this seems to hold considerable promise. (See Sample #10)

To thoroughly carry out the above plan of campaign would involve something of the order of 2000 feet of work, and there is a fair probability sufficient ore would be found to pay for the work, if taken in conjunction with the probability, almost amounting to a certainty, of being able to produce a profit from the mining of small amounts of ore from old workings. It is also reasonable to expect that with a little local development in these old workings, other small bodies would be found.

more In addition to the older workings on the Planet claim, the recent openings on the Palmetto, Ella Belle, Bluebird and Copper Hill, (of which the Palmetto and Ella Belle are the more promising), could no doubt be reopened, and an appreciable tonnage (say of the order of 15 tons daily) maintained therefrom.

Respectfully submitted,

A. BURNETT.

Date of examination, Dec. 10th to 20th, 1918.

Report of Examination of

The Planet Mines, by A. Burnett, Dec 17th 1918

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What is known as the Planet Mine, consists of 39 claims, in one group, situated on the South side of the Bill Williams River, some 12 miles from its junction with the Colorado River. It is most easily reached from the South by auto from Bouse via Midway, the latter a siding on the branch railroad connecting Swansea with Bouse.

Without going into great detail concerning the early history of the property, the following notes may be of interest. The first locations were made in 1864, from which date, various quantities of ore were mined and shipped via the Colorado River to Wales. In 1884 the Mathilde Gold and Copper Mining Co, then operating in the district, brought in and operated a small circular blast furnace. This smelter was not a part of the property, but was rather a custom smelter erected on the property. This smelter operated from May 24th to Oct 3rd 1884, practically continuously, but with frequent ~~xxxxx~~ periods out of blast ~~xxxxxxx~~. A record at the property gives the following information, namely: 6-

Date in blast	Tons of ore	Copper made
May 24th-June 16th	378	47734 lbs
June 11th-July 9th	----	-----
July 10th-13th and 21st to 29th	389	69061 lbs
Aug 1st-Sept 14th	-----	-----
Sept 15th-Oct 3rd	367	86041 lbs
Total	<u>1134 tons</u>	<u>202836 lbs</u>

The above averages ~~12%~~ 9.0% in copper, and from the slag produced, which was shipped to the smelter within the last few years, it is stated a further recovery was made of better than 5.5%. The grade of ore charged to the furnace must then have been of the order of 14.5% in copper. Meanwhile, the better grades of ore were shipped to Wales, but gradually these shipments failed, and the property became idle, assessment work was not continued, and a number of the claims were re-located by one named Augsdahl, who developed further ore bodies and worked in a desultory way for some time. Finally in 1902 the property was sold by Augsdahl to J. Stanley Jones for the sum of \$30,000/00. This gentleman formed the Planet Co., and with some of his friends, instituted a development campaign, this being a continuation of about a year of development by himself personally. From 1902 till 1908, practically all the development of any note was done, this including the sinking of the Incline and Vertical shafts, the latter to a depth of 325 feet, where it connected with the Incline shaft through a short drift.

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## Planet Report 2

J. Stanley Jones was the moving spirit in the Planet Co, and his death in Chicago Dec 29th 1908 seemed to disorganize matters. His brother A.B. Jones had been living at the mine for some years and having inherited a small interest in the property on the death of J. Stanley Jones, he continued to live at the mine. In June 1909, the property was visited by Harvey Weed, on behalf of the General Development Co, and following negotiations, the New Planet Co was organized. Of the capital stock of eight hundred thousand shares of \$5.00 par, the old Company shareholders received two of the new for one of the old. Four hundred thousand shares of the New Planet Co remained in the treasury, and some hundred thousand shares are now in possession of the General Development Co.

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The text of the above is largely from information given me by Mr A.B. Jones, now resident upon the adjoining property, known as the Argus.

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The general Geology of the property is apparent from the number of gulches crossing the ground, and shows a mass of Diorite as underlying the ore. With the exception of local dips, waves

or folds, this mass of Diorite forms a plane surface, constituting the foot wall of the ore bodies, or rather of the material in which these latter occur. This mass dips to the South West at an angle approximating 15 degrees from the horizontal. Above this there occurs a lime formation, through which are large masses of hematite, and in one place at least, namely on the Bill Williams claim a crystalline schist overlies this lime. The orebodies are found in the lime formation, and generally speaking occupy several horizons therein, these horizons being essentially parallel as well as being referred to the Diorite as a base or datum. In the Incline on the Bill Williams claim, the continuity of the lower horizon is remarkable.

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A number of faults cross the property. One of these is the cause of a gulch, known as Smelter Gulch, where the throw of the fault is of the order of some 300 feet. With a strike of about North 30 West, this fault cuts the outcrop, which on the East side of the fault or gulch is but a few feet above the wash, whereas on the West side of the gulch, the outcrop is several hundred feet above the wash, where it is the outcrop of Sentinel Hill on the East side of the latter. Beyond this one displacement, these faults do not seem to have had any influence on the ore, excepting in one place on the Ella Belle claim where a secondary fault has displaced an orebody, or at least cut it in two. In this one instance only, there was occasion to study the faulting to find the continuation of the ore. The further consideration of the faulting ~~xxxx~~ in its relation to the orebodies need not enter into this report.

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junction of the gulches, the latter on higher ground and farther South. The Ella Belle outcrop being on the side of the fault which has dropped is close to the wash, whereas the Sentinal Hill outcrop is on the side of the fault which has been lifted. Proceeding southwesterly along Planet gulch, the Ashley workings are to the West, the Sentinal Hill and Ella Belle to the East and the Bill Williams to the South. On the latter claim, two shafts have been sunk, No 1 being an incline, and No 2 a vertical shaft.

Number 1 Shaft. This shaft for 70 feet is on an incline of about 60 degrees to the southwest, where it flattens out to about 15 degrees and continues in the same direction a further distance of about 500 feet where it connects with the vertical shaft No 2, ~~at a depth of 310 feet~~ at a depth of ~~310~~ 310 feet in the latter. At this level, water prevents further access, but the incline is stated to continue some distance beyond this.

At varying intervals in the incline, short drifts have been driven both North and South, and from these drifts, the bulk of the ore shipped since 1915 was mined, but it is to be observed that the ~~xxx~~ stopes in the upper part of the incline are larger and seemingly more regular than those lower down. At some 70 feet from surface, a long drift has been driven in a southerly direction a distance of some 600 feet. This is known as the "Iron Drift", and for practically its entire length it is in solid, barren Specularite. At its extreme South end however, it passes through a contact with lime, a "Break" and a little copper carbonate is exposed.

Number 2 Shaft. ~~xx~~ This is a vertical shaft on the Bill Williams claim, some 580 feet South West of No.1 shaft. At about 220 feet from surface it penetrates some 12 to 15 feet of copper bearing ore of low grade, and after passing through a barren schist, it again penetrates some 15 feet or thereabouts of copper bearing iron ore, the lower part of which is in water the lowering of which by 4 or 5 feet would give access to the incline from No 1 shaft through a short drift.

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Sentinal Hill is characterized by an extensive iron capping, in which copper ore occurs in more or less irregular masses, and away from any contact with the lime, but as the outcrop be followed around to Smelter gulch, lime is again to be observed. The contact of the lime and iron here as in general throughout the mine has produced ore of shipping grade.

The Bluebird, Palmetto, Ella belle and Copper Hill claims, have all produced ore, and no doubt are capable of producing more, at the

Their description however would extend this report unduly, but beyond the fact that they will add to the production of the property, they have but little bearing on the general situation excepting in one particular, namely, the lateral extent of the ore bearing zone, measured at right angles to the direction of the dip, i.e. along the strike. This distance as measured from the workings of the Ella Belle to those of Copper Hill, in a general East-West direction, is of the order of some 2500 feet. It is reasonable to assume that a similar distribution may be expected upon development from the lower levels of the incline shaft No.1

Albeit there are many openings on the property, there is but little information to be gained from sampling. Even a thorough sampling, which would be a matter of considerable time and labor, would add but little to the information to be gained from a close inspection, for the reason that the assays of these would represent the value of the present faces. A small tonnage might however be blocked out, though it is reasonable to suppose the last leasees did not overlook any ore that could be easily mined without further development. It is known as a positive fact that a great deal of ore has been shipped from the property, and further that the sorting of this ore was in large measure necessary to maintain a shipping grade. As a guide however, a number of samples were taken and copper determinations made on the ground, ~~namely~~ namely:-

Sample 1.	From a pillar in a stope near the top of the incline from No 1 shaft, 2 cuts 8' each	3.8% Cu.	3.65
Sample 2	From bottom of drift (inclined) beyond site of sample No.1, 2'	3.1%	4.30
Sample 3	From face 40 ft West of #2 2 ft	1.4%	1.30
Sample 4	From face beyond #3 High in iron 3'	6.6%	6.34
Sample 5	From bottom of drift (inclined) beyond sample #4, Mixture iron and lime 2½'	4.6%	3.25
Sample 6	East side of Incline near bottom, contains considerable iron 6'	3.9%	4.00
Sample 7	In drift to East of Incline, in lowest accessible part of same / Considerable iron 2 feet	1.7%	1.70
Sample 8	Grab sample of fines off South dump on Ashley claim, being reject from ore sorted from Ashley Glory-Hole	3.7%	3.56
Sample 9	do do North Dump do do	4.3%	4.04
Sample 10	Grab sample off dump, being rejects from ore sorted out off iron ore taken from No 2 Shaft, representing the body of ore encountered immediately above the intersection of the shaft with the incline	4.6%	4.44

The work undertaken by the General Development Co, seems to have had for its object, the exploration of the ground West of the Vertical shaft # 2. For this purpose, a row of churn-drill holes were put down some 800 feet West of the # 2 Shaft. The latter was also deepened to 543 Ft, and at that level, a drift driven almost due West a distance of about 900 feet, in diorite its entire distance. They then raised about 100 feet and intersected the lime formation, where it is stated a very little ore was encountered. Although the object of this work is clear, it appears strange that they did not continue the sinking of the incline from # 1 Shaft which could probably have been done at less cost, in less time and of greater importance, in ~~the~~ the ore zone. From such development, raises of moderate height at intervals would have prospected some 800 feet or more of ground which may be ore bearing. The drill holes give data which indicate that no large bodies of ore may be expected, but in this, they simply bear out conclusions which would be gained from an examination of the upper levels.

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Conclusions From the fact that ore occurs at many places along an outcrop over a distance exceeding 2500 feet, it is probable somewhat similar conditions will be met with at depth, particularly as my examination of the ore bodies in the Incline fails to show any fault or fold which would suggest these ore bodies having been concentrated along the incline, to the impoverishment of the ground on either side. While it is true that the ore from the surface openings may be expected to be of higher grade than that from the lower levels, in fact this was the case, there still remains a large area on either side of the incline, where ore equally as good as that from the incline itself may be expected. As a guide to such exploration, openings should be confined as much as possible to the contacts between the lime and iron bearing in mind the irregularity in boundaries and distribution of the ore bodies so far known and mined, the development of further such bodies must be more or less of a speculation. On the other hand, the continuity of narrow stringers beyond the present faces of the stopes indicates the possibility of their opening up into bodies of ore which will be profitable.

In planning a campaign of development, it would be well to explore by means of a number of raises, the ground now opened up in the incline, at the same time investigating an exposure of ore in No 2 shaft some 220 from surface, this exposure being possibly the South western extension of the orebodies that have been mined from the Ashley, which should it prove to be the case would probably yield a large tonnage of ore which would by sorting yield a profit.

Contemporaneously with the above, it would be advisable to unwater the incline, ~~xxxxxxxxxxxxxxx~~ for inspection, and either above or below the present water level, drift to the South East whatever distance developments might warrant, raise at intervals to explore the higher horizons.

Also at the junction of the Vertical shaft with the incline, the body of copper bearing iron ore should be explored, as this seems to hold considerable promise. See sample # 10

To thoroughly carry out the above plan of campaign would involve something of the order of 2000 feet of work, and there is a fair probability sufficient ore would be found to pay for the work, if taken in conjunction with the probability almost amounting to a certainty of being able to produce a profit from the mining of small amounts of ore from old workings. It is also reasonable to expect that with a little local development in these old workings, other small bodies would be found.

In addition to the older workings on the Planet claim, the more recent openings on the Palmetto, Ella Belle, Bluebird and Copper Hill, (of which the Palmetto and Ella Belle are the more promising,) could no doubt be reopened, and an appreciable tonnage, (say of the order of 15 tons daily) maintained therefrom

Respectfully submitted,

*W. Burnett*

To Mr G.M. Colvocoresses, Gen Mgr.  
Consolidated Arizona Smelting Co.  
Humboldt, Ariz.

Date of Examination, Dec 10th to 20th 1918

Copy

REPORT OF EXAMINATION OF THE PLANET MINES

By A. Burnett, Dec. 17th, 1918.

What is known as the Planet Mine, consists of 39 claims, in one group, situated on the South side of the Bill Williams River, some 12 miles from its junction with the Colorado River. It is most easily reached from the South by auto from Bouse via Midway, the latter a siding on the branch railroad connecting Swansea with Bouse.

Without going into great detail concerning the early history of the property, the following notes may be of interest.

The first locations were made in 1864, from which date various quantities of ore were mined and shipped via the Colorado River to Wales. In 1884 the Mathilde Gold and Copper Mining Co., then operating in the district, brought in and operated a small circular blast furnace. This smelter was not a part of the property, but was rather a custom smelter erected on the property. This smelter operated from May 24th to Oct. 3rd, 1884, practically continuously but with frequent periods out of blast. A record at the property gives the following information, namely:

<u>Date in Blast</u>	<u>Tons of Ore</u>	<u>Copper Made</u>
May 24th - June 10th	378	47,734 lbs.
June 11th- July 9th	---	-----
July 10th-13th and 21st to 29th	389	69,061 lbs.
Aug. 1st - Sept. 14th	---	-----
Sept. 15th - Oct. 3rd	367	86,041 lbs.
Total	1134	202,836 lbs.

The above averages 9.0% in copper, and from the slag produced, which was shipped to the smelter within the last few years, it is stated a further recovery was made of better than 5.5%. The grade of ore charged to the furnace must then have been of the order of 14.5% in copper. Meanwhile, the better grades of ore were shipped to Wales, but gradually these shipments failed and the property became idle, assessment work was not continued and a number of the claims were relocated by one named Augsdahl, who developed further ore bodies and worked in a desultory way for some time. Finally in 1902 the property was sold by Augsdahl to J. Stanley Jones for the sum of \$30,000.00. This gentleman formed the Planet Co., and with some of his friends, instituted a development campaign, this being a continuation of about a year of development by himself personally. From 1902 till 1908, practically all the development of any note was done, this including the sinking of the Incline and Vertical shafts, the latter to a depth of 325 feet, where it connected with the Incline shaft through a short drift.

The personnel of the Company seemed to be men of standing, who really desired to develop the property into a mine. One of these, Mr. Wm. G. Nickerson, of Boston, commissioned Mr. Herman A. Kellar to examine the property in his behalf, which report was later given the Planet Co. In the report, which is dated June 11th, 1907, the statement is made that there are 10,200 tons of ore blocked out in the Incline, assaying 5.9% copper, a further 1400 tons on the dumps, and 2000 to 2500 tons assaying over 8% copper lying all over the property. The average width of the ore is stated to be 4 feet 3 inches. A. P. Jones, brother to J. Stanley Jones, states Mr. Nickerson put \$25,000 into the original Planet Co.

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J. Stanley Jones was the moving spirit in the Planet Co. and his death in Chicago Dec. 29th, 1908 seemed to disorganize matters. His brother, A. B. Jones, had been living at the mine for some years and having inherited a small interest in the property on the death of J. Stanley Jones, he continued to live at the mine. In June, 1909, the property was visited by Harvey Weed, on behalf of the General Development Co., and following negotiations, the New Planet Co. was organized. Of the capital stock of eight hundred thousand shares of \$5.00 par, the old Company shareholders received two of the new for one of the old. Four hundred thousand shares of the New Planet Co. remained in the treasury, and some hundred thousand shares are now in possession of the General Development Co.

Following the organization of the New Planet Co. a drilling campaign was commenced and carried out by the General Development Co. for about a year, when expectations not being realized, the property was abandoned in so far as further work was concerned, in August 1910, from which date the property remained idle.

In March, 1915, A. B. Jones secured a three year lease from the New Planet Co. and in the six or seven months following shipped part of the dumps from former development. Inability to handle the situation induced him to relinquish his lease to the North Western Leasing and Development Co. or rather to relinquish his rights in his lease, upon payment to him of Eight Thousand Dollars by the North Western Leasing and Development Co. This latter concern secured a lease on the property directly from the New Planet Co., for a period of three years from October, 1915, and it was during their tenure of this lease that practically all the ore developed by the old company for the six years from 1902 to 1908 was mined and shipped.

The text of the above is largely from information given me by Mr. A. B. Jones, now resident upon the adjoining property, known as the Argus.

In view of the existence of Mr. Kellar's report, showing the probability, amounting almost to a certainty, of a profitable body of ore ready for mining, together with the information the General Development Co. must have had, it seems strange that this ore could have remained unmined for so long, particularly as so little capital would have been required to immediately start shipments. Development was complete, and in all the North Western Leasing Co.'s operations, practically no development work was done, and very little new ore looked for. The object seemed to be to simply extract whatever ore was shown, make certain an immediate profit, and risk nothing whatever in further search. In this they were successful, as any further ore bodies of any extent must be searched for and developed. On the other hand a number of faces have been left which are capable of producing in a small way, to which reference will be made later.

The only maps obtainable at the time of this examination were two, one on a scale of 1" to 600', showing the claims as a group, the other a tracing of the Incline and drifts therefrom to a scale of 1" to 40' on the Bill Williams claim, together with some of the openings on the Ashley and Sentinel Hill claims. For this reason this report must be largely a description to be used with whatever maps may be available later, or that may be made from surveys.

The general geology of the property is apparent from the number of gulches crossing the ground, and shows a mass of Diorite as underlying the ore. With the exception of local dips,

waves or folds, this mass of Diorite forms a plane surface, continuing the foot wall of the ore bodies, or rather of the material in which these latter occur. This mass dips to the Southwest at an angle approximating 15 degrees from the horizontal. Above this there occurs a lime formation, through which are large masses of hematite, and in one place at least, namely on the Bill Williams claim, a crystalline schist overlies this lime. The ore bodies are found in the lime formation, and generally speaking occupy several horizons therein, these horizons being essentially parallel as well as being referred to the Diorite as a base or datum. In the Incline on the Bill Williams claim, the continuity of the lower horizon is remarkable.

The lime formation is of the order of some 200 feet in thickness and is replaced in an irregular manner by hematite. In places this replacement has been so extensive and regular that large masses of a fine grade of iron ore has been produced. Sometimes this iron will be in contact with the Diorite, or again it will occur as tongues varying in thickness and width, with lime both above and below. Though the iron is more or less parallel to the underlying diorite, it does form folds within the lime similar to an anticline, these folds being limited by the replacement of the lime rather than by movement within the lime itself. A very good example of such a fold can be seen in the Sentinel Hill workings, where in a stope almost vertical the wall of iron remains, this iron limiting the stope and ore at this point. Also in the Ashley Glory Hole, one leg of such a fold is to be seen, the iron here also limiting the stope and ore, and as is apparent from openings below the Ashley, this iron continues its downward course, gradually flattening out as it approaches the diorite, at which point it is but a few feet above the latter.

The occurrence of tongues of iron penetrating the lime gives a condition where the iron will be above the lime in one place and below the lime in another place, and where folds occur, to one side or the other respectively. Thus there are produced in the lime formation itself, an indefinite number of contacts between the iron and the lime, the general habit of these being parallel to the foot wall, though not necessarily so on account of the folds. These contacts are known locally as "Breaks" and their influence is very marked on the extent and richness of ore bodies.

A number of faults cross the property. One of these is the cause of a gulch, known as Smelter gulch, where the throw of the fault is of the order of some 300 feet. With a strike of about North 30 West, this fault cuts the outcrop, which on the East side of the fault or gulch is but a few feet above the wash, whereas on the west side of the gulch, the outcrop is several hundred feet above the wash, where it is the outcrop of Sentinel Hill on the East side of the latter. Beyond this one displacement, these faults do not seem to have had any influence on the ore, excepting in one place on the Ella Belle claim where a secondary fault has displaced an orebody, or at least cut it in two. In this one instance only, there was occasion to study the faulting to find the continuation of the ore. The further consideration of the faulting in its relation to the orebodies need not enter into this report.

In describing the property, particularly as very incomplete maps are available, a start will be made from the mine office. Two gulches, namely Smelter Gulch and Planet Gulch, meet some few hundred feet East of the office, from which point the former has a general southeasterly trend, the latter a southwesterly trend. These two gulches form the boundary of the Ella Belle and Sentinel Hill claims, the former on low ground near the

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junction of the gulches, the latter on higher ground and farther south. The Ella Belle outcrop being on the side of the fault which has dropped, is close to the wash, whereas the Sentinal Hill outcrop is on the side of the fault which has been lifted. Proceeding southwesterly along Planet gulch, the Ashley workings are to the West, the Sentinal Hill and Ella Belle to the East and the Bill Williams to the South. On the latter claim, two shafts have been sunk, No. 1 being an incline, and No. 2 a vertical shaft.

#### NO. 1 SHAFT.

This shaft for 70 feet is on an incline of about 60 degrees to the southwest, where it flattens out to about 15 degrees and continues in the same direction a further distance of about 500 feet where it connects with the vertical shaft No. 2 at a depth of 310 feet in the latter. At this level water prevents further access, but the incline is stated to continue some distance beyond this. At varying drifts in the incline short drifts have been driven both North and South, and from these drifts, the bulk of the ore shipped since 1915 was mined, but it is to be observed that the stopes in the upper part of the incline are larger and seemingly more regular than those lower down. At some 70 feet from the surface, a long drift has been driven in a southerly direction a distance of some 600 feet. This is known as the "Iron Drift" and for practically its entire length it is in solid, barren Specularite. At its extreme South end, however, it passes through a contact with lime, a "Break" and a little copper carbonate is exposed.

#### NO. 2 SHAFT.

This is a vertical shaft on the Bill Williams claim, some 580 feet Southwest of No. 1 shaft. At about 200 feet from surface it penetrates some 12 to 15 feet of copper bearing ore of low grade, and after passing through a barren schist, it again penetrates some 15 feet or thereabouts of copper bearing iron ore, the lower part of which is in water, the lowering of which by 4 or 5 feet would give access to the incline from No. 1. shaft through a short drift.

#### ASHLEY GLORY-HOLE

This working is on the West side of Planet gulch, some 300 feet Northeast from No. 1 shaft, and is a direct continuation of the ore bodies in the incline itself. Directly opposite the Ashley and on the East side of the gulch are openings on the Planet claim, and above the latter and farther North and East, the workings on Sentinal Hill claim.

On the Planet claim, three distinct horizons of ore are to be observed, from all of which ore has been mined. The lowest of these can be reached by a number of shallow shafts, connected by drifts below the surface of Planet gulch. The ore on this horizon is narrow and lies very close to the diorite, and parallel thereto. The continuity of the formation from one side of the gulch to the other without a break of any kind, shows Planet gulch to have been due to causes other than faulting. The middle and upper horizons are some distance above the gneiss or diorite, and have produced considerably more ore than the lowest one. Their connection with the Ashley stopes prior to the cutting away of the gulch is clearly seen.

Sentinal Hill is characterized by an extensive iron capping, in which copper ore occurs in more or less irregular masses, and away from any contact with the lime, but as the outcrop is followed around to Smelter gulch, lime is again to be observed. The contact of the lime and iron here as in general throughout the mine has produced ore of shipping grade.

*upper zones should show specular iron carbonate*

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The Bluebird, Palmetto, Ella Belle and Copper Hill claims have all produced ore, and no doubt are capable of producing more. Their description, however, would extend this report unduly, but beyond the fact that they will add to the production of the property, they have but little bearing on the general situation excepting in one particular, namely, the lateral extent of the ore bearing zone, measured at right angles to the direction of the dip, i.e. along the strike. This distance, as measured from the workings of the Ella Belle to those of Copper Hill, in a general East-West direction, is of the order of some 2500 feet. It is reasonable to assume that a similar distribution may be expected upon development from the lower levels of the incline shaft No. 1.

Albeit there are many openings on the property, there is but little information to be gained from sampling. Even a thorough sampling, which would be a matter of considerable time and labor, would add but little to the information to be gained from a close inspection, for the reason that the assays of these would represent the value of the present faces. A small tonnage might, however, be blocked out, though it is reasonable to suppose the last lessees did not overlook any ore that could be easily mined without further development. It is known as a positive fact that a great deal of ore has been shipped from the property, and further that the sorting of this ore was in large measure necessary to maintain a shipping grade. As a guide, however, a number of samples were taken and copper determinations made on the ground, namely:

	% Cu.	C.A.S. Co. Assay						
		Oz. Au	Oz. Ag	% Cu	% Insol	% Fe	% CaO	% S
<u>Sample #1.</u> From a pillar in a stope near the top of the incline from No.1 shaft, 2 cuts 8' each.	3.8	Trace	Trace	3.68	17.0	46.2	---	3.1
<u>Sample #2.</u> From bottom of drift (inclined) beyond site of sample No.1, 2'	3.1	Trace	Trace	4.36	29.4	36.4	---	3.5
<u>Sample #3.</u> From face 40' west of #2, 2'	1.4	Trace	Trace	6.34	13.8	49.0	---	5.3
<u>Sample #4.</u> From face beyond #3 High in iron, 3'	6.6	Trace	Trace	1.36	63.8	13.4	---	3.3
<u>Sample #5.</u> From bottom of drift (inclined) beyond sample #4, mixture iron and lime, 2½'	4.6	0.01	Trace	3.28	46.2	26.0	---	2.1
<u>Sample #6.</u> East side of incline near bottom, contains considerable iron, 6'	3.9	0.02	Trace	4.00	14.2	48.8	---	5.9
<u>Sample #7.</u> In drift to East of incline, in lowest accessible part of same. Considerable iron, 2'	1.7	Trace	Trace	1.76	56.0	22.8	---	0.6

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	% Cu.	C A S Co. Assay						
		Oz. Au	Oz. Ag	% Cu	% Insol	% Fe	% CaO	% S
<u>Sample #8.</u> Grab sample of fines off South dump on Ashley claim, being reject from ore sorted from Ashley-Glory Hole	3.7	Trace	Trace	3.56	40.7	17.2	9.0	Trace
<u>Sample #9.</u> Grab sample of fines off North Dump on Ashley Claim, being reject from ore sorted from Ashley-Glory Hole	4.3	Trace	Trace	4.04	40.6	14.0	10.8	Trace
<u>Sample #10.</u> Grab sample off dump, being rejects from ore sorted out of iron taken from No. 2 shaft, representing the body of ore encountered immediately above the intersection of the shaft with the incline	4.6	Trace	Trace	4.44	24.4	44.4	---	Trace

(It appears that the samples have gotten mixed in the Humboldt Laboratory and that Humboldt samples Nos. 3 and 4 are interchanged with Burnett's samples Nos. 2 and 5.)

The work undertaken by the General Development Co. seems to have had for its object the exploration of the ground west of the Vertical shaft No. 2. For this purpose a row of churn-drill holes were put down some 800 feet West of the No. 2 shaft. The latter was also deepened to 543 feet, and at that level, a drift driven almost due West a distance of about 900 feet, in diorite its entire distance. They then raised about 100 feet and intersected the lime formation, where it is stated a very little ore was encountered. Although the object of this work is clear, it appears strange that they did not continue the sinking of the incline from No. 1 shaft, which could probably have been done at less cost, in less time and of greater importance in the ore zone. From such development, raises at moderate height at intervals would have prospected some 800 feet or more of ground which may be ore bearing. The drill holes give data which indicate that no large bodies of ore may be expected, but in this, they simply bear out conclusions which would be gained from an examination of the upper levels.

Conclusions.

From the fact that ore occurs at many places along an outcrop over a distance exceeding 2500 feet, it is probable somewhat similar conditions will be met with at depth, particularly as my examination of the ore bodies in the Incline fails to show any fault or fold which would suggest these ore bodies having been concentrated along the incline, to the impoverishment of the ground on either side. While it is true that the ore from the surface openings may be expected to be of higher grade than that from the lower levels, in fact this was the case, there still remains a large area on either side of the incline, where ore equally as good as that from the incline itself may be expected. As a guide to such exploration, openings should be confined as much as possible to the contacts between the lime and iron. Bearing in mind the irregularity in boundaries and distribution of the ore bodies so far known and mined, the development of more further such bodies must be more or less of a speculation. On the other hand, the continuity of narrow stringers beyond the present faces of the stopes indicates the possibility of their opening up into bodies of ore which will be profitable.

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In planning a campaign of development, it would be well to explore by means of a number of raises, the ground now opened up in the incline, at the same time investigating an exposure of ore in No. 2 shaft some 220 from surface, this exposure being possibly the southwestern extension of the orebodies that have been mined from the Ashley, which, should it prove to be the case, would probably yield a large tonnage of ore which would by sorting yield a profit.

Contemporaneously with the above, it would be advisable to unwater the incline for inspection, and either above or below the present water level drift to the southeast whatever distance developments might warrant, raising at intervals to explore the higher horizons.

Also at the junction of the Vertical Shaft with the Incline, the body of copper bearing ore should be explored, as this seems to hold considerable promise. (See Sample #10)

To thoroughly carry out the above plan of campaign would involve something of the order of 2000 feet of work, and there is a fair probability sufficient ore would be found to pay for the work, if taken in conjunction with the probability, almost amounting to a certainty, of being able to produce a profit from the mining of small amounts of ore from old workings. It is also reasonable to expect that with a little local development in these old workings, other small bodies would be found.

more In addition to the older workings on the Planet claim, the/recent openings on the Palmetto, Ella Belle, Bluebird and Copper Hill, (of which the Palmetto and Ella Belle are the more promising), could no doubt be reopened, and an appreciable tonnage (say of the order of 15 tons daily) maintained therefrom.

Respectfully submitted,

A. BURNETT.

Date of examination, Dec. 10th to 20th, 1918.

## REPORT OF EXAMINATION OF PLANET MINE

W.V.DeCamp, March 12th to 16th. 1920

**GEOLOGY:** The rocks in the vicinity of the Planet Mine consists of a series of basal granites and gneiss, capped by limestone, argillites and other sediments. At a later period, the sediments overlying the gneiss were intruded by a basic rock, more or less parallel to the bedding plains of the sediments. This intrusive, instead of being in a continuous sheet or sill, split and formed several tongues striking out into the limestone at various elevations above the gneiss. The intrusive was later altered to an amphibolite, due to the intense dynamo metamorphism, which accompanied a period of shearing and faulting. The shearing is along well developed lines, and apparently allowed at a later period the introduction of mineralizing solutions.

The ores encountered on the property are entirely of the replacement type and consist of iron and copper as pyrite and chalcoppyrite both in the amphibolite and the limestone but at no point does the mineralization reach or penetrate the basal gneiss. Alteration of the original ore has resulted in the formation of secondary ores of both copper and iron, copper ores consisting largely of malachite, azurite, cuprite and chalcocite.

Mineralization apparently occurred after the period of shearing and distortion, and in some cases was accompanied by intense silification, particularly in connection with replacement in the limestone. In case of the mineralization of the amphibolite, the replacement was generally more complete resulting in massive tabular deposits of pyrite, chalcoppyrite and specularite. Final alteration resulted in the formation of red hematite as well as some secondary specularite.

According to Probert, who observed some low grade nuclear pyrite, he presupposes a very low grade primary ore evenly disseminated through the mineralized areas. This hypothesis is not borne out at all points as shown by recently encountered high grade nuclear chalcoppyrite and finally disseminated chalcocite in the basic iron ore. In general, the deposit was undoubtedly of low copper tenor but there is distinct evidence in the Palmetto, Ella Belle and Planet inclines of certain zones that were more highly mineralized. Secondary enrichment has resulted in the concentration of high grade ores in these particular areas, as well as in troughs, folds and along fault plains and where descending meteoric waters carried solutions in contact with other rocks and minerals resulting in deposition of carbonates and chalcocite. At a distance of approximately 2000 ft. from the bottom of the present incline and along the dip of the present known ore bearing formation there is evidence of extensive faulting. This faulting may have considerable effect on the future of the mine, although development alone will tell.

Faulting to the northeast has resulted in several isolated areas which have been dropped a great distance and which have produced a considerable tonnage of high grade secondary ore.

**GENERAL:** In general, as shown by the attached map, the dip of the formation is from 12 to 15° to the southwest and the strike about north 30 west. The width of the zone in which ore in paying quantities has been found along this strike, is approximately 610 ft., the distance on the dip from the Palmetto to the bottom of the Planet Incline is about 2500 ft. and there is every possibility of a continuation in this direction. The churn drilling, as shown by the position of the seven holes drilled by the Lewisohns is of no value whatever, since a continuous body of ore could hardly be expected and particularly are the drilling results not conclusive, since, as shown, a gap of 900 ft. was left directly in line with the general trend of the mineralized zone. The property, as stated in previous reports, could much more easily and cheaply be developed by means of the Planet Incline and this work should consist of lateral and depth development, as well as by raises in overlying beds, since there are three, and possibly four, distinct ore bearing zones lying parallel to the gneiss and within vertical distance of 200 ft.

Production from the property in the past has been largely from zone of concentration, where, due to local conditions, such as faults, contacts, sheering and folds, the copper has been leached from overlying material carried down and deposited as glance and carbonate. Without doubt, further ore of this character will be encountered and the Ella Belle and Palmetto Claims now show ore available for mining, and ore is reported at the bottom of the Planet Incline. With the exception of these three points the mining cost on isolated bodies of ore will be excessive and under present market conditions, prohibitive. The Ella Belle and Planet Inclines may be able to produce ore of 8% or better at a reasonable cost for mining, which with slightly improved transportation could be treated under present conditions.

**TRANSPORTATION:** Transportation can be greatly improved by repairing the road from Planet to Swansea and by building a loading platform at Swansea. The total cost of this work should not exceed \$2000. and when completed, a hauling cost of \$4.50 per ton should be obtained; furthermore, this road can be maintained much more cheaply than the present road to Midway.

**CONCLUSIONS:** Development for the present should be confined to the sinking of the Ella Belle Incline below the water level and to lateral work and up

raises from the Planet Incline.

There is little probability of finding sulphides below the water level in any of the workings since a long period at leaching probably preceded the faulting and without doubt the present water level has little or no relation to the water level during the period of secondary enrichment.

In connection with the C.V. Process, there is a possibility of developing sufficient ore to justify experiments in this direction and in this connection, consideration should be given to the main wash on the Planet Claim, as there is undoubtedly a large amount of ore in this wash. A few test pits at widely scattered points would determine whether or not there was sufficient ore to justify an extensive sampling of same. The sampling which Mr. Ferguson contemplates, will give a general idea of the amount of ore of various grades, both siliceous and basic, that can be mined and will undoubtedly enable one to draw definite conclusions regarding the future policy of the company in the development of the mine.

When operations have proceeded a little further, it would be well to undertake a careful geological survey of the property in the vicinity of the known ore bearing zone, paying particular attention to faulted ores, since there is a strong probability of finding extensions of high grade secondary ore bodies at or below the present water level, as well as laterally.

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W. V. D.

Humboldt, Arizona.  
April 3, 1920.

REPORT OF EXAMINATION OF PLANET MINE By W. V. DeCamp

March 12th to 16th, 1920

GEOLOGY

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The ores encountered on the property are entirely of the replacement type and consist of iron and copper as pyrite and chalcopyrite both in the amphibolite and the limestone but at no point does the mineralization reach or penetrate the basal gneiss. Alteration of the original ore has resulted in the formation of secondary ores of both copper and iron, copper ores consisting of largely malachite, azurite, cuprite and chalcocite.

Mineralization apparently occurred after the period of shearing and distortion, and in some cases was accompanied by intense silification, particularly in connection with replacement in the limestone. In case of the mineralization of the amphibolite, the replacement was generally more complete resulting the massive tabular deposits of pyrite, chalcopyrite and specularite. Final alteration resulted in the formation of red hematite as well as some secondary specularite.

According to Probert, who observed some low grade nuclear pyrite, the very low grade primary ore evenly disseminates through the mineralized areas. This hypothesis is not borne out at all points as shown by recently encountered high grade nuclear chalcopyrite and finally disseminated chalcocite in the basic iron ore. In general, the deposit was undoubtedly of low copper tenor but there is distinct evidence in the Palmetto, Ella Belle and Planet inclines of certain zones that were more highly mineralized. Secondary enrichment has resulted in the concentration of high grade ores in these particular areas, as well as in troughs, folds and along fault planes and where descending meteoric waters carried solutions in contact with other rocks and minerals resulting in deposition of carbonates and chalcocite. At a distance of approximately 2000' from the bottom of the present incline and along the dip of the present known ore bearing formation there is evidence of extensive faulting. This faulting may have considerable effect on the future of the mine, although development alone will tell. Faulting to the northeast has resulted in several isolated areas which have been dropped a great distance and which have produced a considerable tonnage of high grade secondary ore.

GENERAL

In general, as shown by the attached map, the dip of the formation is from 12 to 15 deg. to the southwest and the strike about north 30 west. The width of the zone in which ore in paying quantities has been found along this strike, is approximately 610', the distance on the dip from the Palmetto to the bottom of the Planet Incline is about 2500' and there is every possibility of a continuation in this direction. The churn drilling, as shown by the position of the seven holes drilled by the Lewisohns is of no value whatever, since a continuous body of ore could hardly be expected and particularly are the drilling

results not conclusive, since, as shown, a gap of 900' was left directly in line with the general trend of the mineralized zone. The property as stated in previous reports, could much more easily and cheaply be developed by means of the Planet Incline and this work should consist of lateral and depth development, as well as by raises in overlying beds, since there are three, and possibly four, distinct ore bearing zones lying parallel to the gneiss and within vertical distance of 200'.

Production from the property in the past has been largely from zones of concentration where, due to local conditions, the copper has been leached from overlying material, carried down and deposited as glance and carbonate. Without doubt, further ore of this character will be encountered and the Ella Belle and Palmetto Claims now show ore available for mining, and ore is reported at the bottom of the Planet Incline. With the exception of these three points the mining cost on isolated bodies of ore will be excessive and under present market conditions, prohibitive. The Ella Belle and Planet Inclines may be able to produce ore of 8% or better at a reasonable cost for mining, which with slightly improved transportation could be treated under present conditions.

#### TRANSPORTATION

Transportation can be greatly improved by repairing the road from Planet to Swansea and by building a loading platform at Swansea. The total cost of this work should not exceed \$2000, and when completed a hauling cost of \$4.50 per ton should be obtained; furthermore, this road can be maintained much more cheaply than the present road to Midway.

#### CONCLUSIONS

Development for the present should be confined to the sinking of the Ella Belle Incline below the water level and to lateral work and up raises from the Planet Incline.

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## PLANET MINE

District Planet  
Location On South bank of Bill Williams river, 12 miles above the Colorado and eleven miles North of Swansea, Ariz.  
Owners New Planet Copper Mining Company of New York.  
Date examined November 24, 1922 to Jan. 21, 1923 by H. S. McKnight.

### OBJECT OF EXAMINATION:

6 To determine whether or not there was present a body of low grade ore of sufficient value, extent and accessibility to warrant the construction of a treatment plant on the grounds.

### MAPS ACCOMPANYING THIS REPORT

- No. 1 - Topographical map showing the surface geology, surface and underground workings, and mining claims of western portion.
- No. 2 - Ditto - of Eastern portion.
- No. 3 - Vertical projections. Assay plans showing percentage of copper content and location of samples taken.

### GEOLOGY

The geology consists of a silicious diorite gneiss overlain by limestone and this, in turn, overlain by a series of quartz and mica schists. These schists have been entirely removed by erosion over a large portion of the property.

The limestone lies unconformably upon the basal gneiss and the contact between the two forms a fairly regular plane with minor waves and folds which strikes approximately North-South and dips toward the West at about  $10^{\circ}$ . This gneiss constitutes the footwall of the ore-bearing zone and in no place was it found to have been mineralized.

The overlying limestone varies in thickness from a few feet to more than 100' and is very silicious, in some places closely resembling quartzite. It is highly metamorphosed and contains varying amounts of amphibolites. Practically all of the mineralization has taken place within the limestone itself and along the contact between the limestone and gneiss, and the ores occur as typical limestone replacements. This replacement has been so thoroughly and extensive in places that a very good grade of iron ore has been produced. The

iron occurs chiefly as specularite and apparently was deposited prior to the deposition of the copper minerals. The most notable example of such iron ore bodies which have been encountered through development work is to be seen in the iron drift from the main incline shaft on the South end of the Planet Claim. This iron body is said to be entirely free from copper. In general, the ore occurs in flat narrow bodies lying parallel to the gneiss footwall and at varying distances from it. In places there are several distinct ore zones on planes lying one above the other.

There is evidence of very considerable faulting having taken place in the area. There are both pre-mineral and post-mineral faults, the most notable example of the latter being located as shown on Map No. 1 by the dotted line X-X, striking N.W. and dipping N.E. about fifty degrees. This is a normal fault and shows a vertical displacement at Sentinel Hill of about three hundred feet. Going S.E. from Sentinel Hill the vertical displacement diminishes. The Gulch known as Smelter Wash was formed by this fault.

Prior to the period of mineralization, there apparently existed a period of considerable minor faulting, shearing and distortion. These pre-mineral faults did not cause any great displacement but formed fissures and planes of weakness along which the mineralization subsequently took place.

The main mineralized fissure strikes NE-SW and extends from the Smelter Wash fault at the top of Sentinel Hill toward the SW parallel to the line A-A Map No. 1. The main incline workings are in this mineralized fissure zone.

Cross fissures extend on either side of this main fissure and strike in a general NW-SE direction, the mineralization extending laterally along these planes.

As stated above, mineralization has taken place quite extensively along the plane of contact between the gneiss and limestone.

It does not appear that there was originally a low grade primary ore evenly disseminated through the mineralized area which was subsequently leached and re-deposited as secondary bodies.

There has been some alteration of the original iron and copper ores which has resulted in the formation of secondary ores consisting largely of red hematite, malachite, azonite, cuprite and chalcocite. Secondary enrichment has occurred in troughs and folds and along fault planes resulting in the formation of small irregular high grade ore bodies. A few specimens of chalcopyrite and pyrite were found but no bodies of any consequence.

#### DEVELOPMENT

Considerable development work has been done at various places on the property but the irregularity of the ore bodies in shape, size and location makes systematic development extremely difficult. At present there is practically no ore developed except that left in pillars in the old stopes. This is due chiefly to the fact that the last work done on the property was done by lessees who mined and shipped all commercial ore in sight without doing any appreciable amount of development work.

#### NO. 1 SHAFT OR MAIN INCLINE:

This shaft was sunk 75' on an incline of 60° to within a few feet of the gneiss footwall. From this point it was continued in a S.W. direction on an incline of approximately fifteen degrees for about 700 feet, most of it being driven along the footwall. At various points along the incline short drifts have been driven on either side and considerable stoping has been done, especially in the upper portion.

Toward the lower end a short drift east connects with the vertical shaft No. 1. These lower workings are now filled with water and are inaccessible but previous sampling by Mr. C. Ferguson show narrow bodies of ore as shown on the assay plans.

Vertical samples taken in various raises above this incline and also in the steep portion of the shaft (see assay plan) show this ground to be of no interest, the only commercial ore occurring in a narrow body lying on or near the gneiss footwall.

#### VERTICAL SHAFT NO.2

Was sunk on Bill Williams Claim 550 ft. connecting with the above mentioned drift from the Main Incline at 350 ft. below the collar

and extending on down into the basal gneiss. At the bottom of the shaft a drift was driven West in the gneiss 900'. At the face of this drift an 85' vertical raise cuts through the gneiss into the overlying limestone but it is said that no values were anywhere encountered. None of these workings were examined because of their inaccessibility. The results of a previous examination of this shaft are shown on accompanying prints.

ASHLEY WORKINGS:

These workings are on the West side of the Planet Wash just North of the Main Incline Shaft. Considerable open stoping has been done here and a good grade of sorted ore shipped. The ore occurs chiefly as carbonates in a gray silicious limestone, with iron less abundant than in other localities. There are several ore horizons here, one vein or body lying on the limestone-gneiss contact and other irregular lenses occurring above.

PLANET WORKINGS:

These workings are on the East side of Planet Wash just opposite the Ashley workings. This is the same ore body as that in the Ashley workings but there is more iron present and the ground is softer. Here too there are several <sup>ore</sup> horizons with barren limestone between.

SENTINEL HILL:

Is N.E. of the Planet and Ashley workings and was formed by the uplift which caused the main Planet fault. Practically the entire surface of the hill consists of limestone and iron which is the ore bearing material. The overlying schists have been removed by erosion. Considerable limestone has been replaced by iron here forming irregular blankets and masses of hematite. The ore occurs principally on or very near the gneiss footwall and parallel to it but in several places the mineralization extends upward along fissure planes. The ore bearing formation here varies in thickness from a few feet to over 100'. Samples taken in the workings at the South and East of Sentinel Hill gave uninteresting results but fair returns were obtained from samples taken in workings in the limestone point on the N.W. end of the hill.

ELLA BELLE

Workings are North of Sentinel Hill and on opposite side of the main Planet Fault. The ore zone here is approximately 300' lower than that on the E. side of Sentinel Hill uplift, and the dip of the formation is toward the E. rather than toward the S.W. Here a vein from 4 to 6 ft. thick has been exposed and partially mined which will average from 2 to 3 per cent copper. The ore has been faulted considerably and except for one block about 4000 tons of ore running 2.64% Cu. no positive tonnage has been developed.

THE SMELTER GULCH, BLUE BIRD, PALMETTO and NICKERSON

Workings are east of the Ella Belle and are shown on Map No. 2. The results of samples taken in this part of the property are shown on the above map. The formation and ore occurrence here is identical with that on the West side of the main Smelter gulch fault. Some fairly good ore has been removed from the Blue Bird and Palmetto claims but nowhere is there any appreciable tonnage of commercial ore in evidence at present.

Commercial ore in small quantities has been mined on a number of other claims in the group such as the Copper Hill, Iron Hill, La Mexicana, Byron and Boston but these workings are of less importance than those considered above.

PLANET WASH:

The loose material in the Planet Wash below the Planet and Ashley workings shows on the surface evidence of considerable copper content. For the purpose of sampling this material pits were dug at points as shown on Map No. 1.

No. 1 Pit was sunk 19 ft. to bedrock and the assay returns on the samples obtained were as follows:

From 0 to 5 ft. below surface	-	1.04	%	Copper
" 5 " 10 "	"	-1.73	"	"
" 10 " 15 "	"	-1.73	"	"
" 15 " 19 "	"	- Tr.	"	"

Out No. 2 was sunk 13.5 ft. to bedrock and the following results obtained:

-6-

From 0-5 ft. below surface	-	2.22	% Cu.
" 5-10 "	" "	0.76	" "
" 10-13.5 "	" "	0.08	" "

Pit No. 3 was sunk 10 ft. with following results.

From 0-5 ft. from surface	-	1.93	% Cu.
" 5-10 "	" "	0.08	" "

Pit No. 4 was sunk 20' with following results:

From 0-5 ft. from surface	-	1.29	% Cu.
" 5-10 "	" "	0.12	" "
" 10-15 "	" "	0.08	" "
" 15-20 "	" "	0.04	" "

From the above data it is evident that the wash material is of no commercial importance. The particles of copper ore showing on the surface was evidently washed down from the dumps at the Planet, Ashley and Main Incline workings above.

DUMPS:

Samples were taken of all the important dumps and the estimated tonnages and values are as shown below:

<u>ASHLEY</u>	<u>TONS</u>	<u>% CU.</u>	<u>TONS x % CU.</u>
South Dump	550	2.19	1204.5
Center Dump	2500	2.21	5525.0
North Dump	450	2.59	1165.5
Morgan Stope Dump	150	2.20	330.0
	<hr/>		<hr/>
	3650		8225.0
 <u>PLANET</u>			
Dump W. of Tunl #11	120	1.41	169.2
" at Tun. # 6	200	2.44	488.0
" above Tun. # 6	50	1.33	66.5
" " " # 9 at O.C.	120	5.08	609.6
	<hr/>		<hr/>
	490		1333.3
 <u>SENTINEL HILL</u>			
Dump at Sta. 21	1500	4.33	6495.0
" N. of Sta. 21	450	2.18	981.0
" at Sta. 17	1350	1.90	2565.0
" " " 18	1200	2.22	2664.0
" " " 19	1200	3.03	3636.0
" N. of Sta. 20	200	1.56	312.0
	<hr/>		<hr/>
	5900		16653.0
 <u>ELLA BELLE</u>			
Ore Bine	5	20.66	103.3
South along track	30	7.04	211.2
Main dump	2000	2.04	2080.0
	<hr/>		<hr/>
	2035		2394.5
 <u>BLUE BIRD</u>			
Dump at Sta. 67	80	0.85	68.0
" " " 68	50	1.12	56.0
" " " 52	150	1.84	276.0
	<hr/>		<hr/>
	280		400.0

PALMETTA

Dump at O.C.	200	1.33	266.0
" " Shaft	<u>70</u>	<u>1.12</u>	<u>78.4</u>
	270		344.4

NICKERSON

Dump at O.C. North	500	1.52	760.0
" " " " South	<u>100</u>	<u>1.06</u>	<u>106.0</u>
	600		866.0

MEX. TUNNEL	25	3.58	89.5
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Total	13,250		30,305.7
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The above figures show a total tonnage of 13,250 tons which average 2.28% Copper.

In addition there are about 2000 tons of 1% ore on the dump at the Main Incline shaft.

CHURN DRILL HOLES:

The data obtained from eight churn drill holes put down by the Lewisohns would indicate that there is no large ore body extending laterally from the main mineralized zone. The results of this drilling are not at all conclusive, however, as there is a gap between the holes of some 800' which is in direct line with the main mineralized fissure parallel to the line A-A Map #1.

The data and location of these holes are given on accompanying sheets obtained from the Lewisohns.

CONCLUSIONS:

Although there is a large number of openings on the property and several thousand feet of vertical and lateral development, there is no appreciable tonnage of positive ore blocked out. A large tonnage of ore has been shipped from the property, most of which was shipped by the North Western Leasing & Development Company, but hand sorting has been necessary in order to maintain a shipping grade.

As described above, the ore occurs in small blankets and lenses as replacements in the limestone without any regularity as to shape or size, making it impossible to block out any considerable positive tonnage. A small stringer in a present face may, with a few feet of development, open out into a good sized ore body, or it may pinch out entirely.

It is entirely reasonable to assume that by following the small stringers of ore in the principal mineralized channels and gouging out the small lenses as encountered, a large tonnage of sorting ore could be recovered as has been done in the past, but it is impractical to obtain any definite figures upon which to base any tonnage of commercial ore available.

It was thought possible that the ground lying between and adjacent to the numerous small high grade stringers would, in some places at least, contain sufficient values to allow for mining on a large scale, thereby making a large low-grade product which could be profitably treated on the property. All of the sampling was done with this idea in view, but, as is apparent from the data obtained, this condition does not hold.

Further development at depth along the line of the Main Incline, might possibly disclose important ore bodies but a lower grade may be expected. There still remains a large area on either side of the incline, however, where commercial ore may be expected, and the same may be said of other workings such as the Planet, Sentinel Hill and especially the Ella Belle.

From a lessee's standpoint the property has merit but indications are that it is not likely to become a large producer.

H. S. McKnight

# TABLE

Showing Net Returns to 
 { a - Copper Co. 15%  
 b - Leasing Co. 12%  
 c - Contractor
  
 { Assuming:  
 Hauling - 550 pt.  
 Freight 250 ft.
   
 Contractor Furnishing Labor & Supplies

Grade of Ore	Price of Cu	18¢	19¢	20¢	21¢	22¢	23¢	24¢	25¢	26¢
7%	a	162	180	199	218	237	256	274	293	311
	b	110	123	136	148	161	174	187	200	213
	c	255	350	444	539	633	727	821	915	1009
8%	a	201	222	244	266	287	309	331	351	374
	b	135	151	166	180	195	210	226	239	254
	c	452	559	666	774	884	979	1096	1204	1312
9%	a	240	264	288	315	337	361	385	409	432
	b	163	180	196	212	229	248	265	281	296
	c	646	767	889	1008	1131	1250	1373	1494	1616
10%	a	279	306	333	360	387	414	441	468	495
	b	190	208	226	245	263	282	300	318	336
	c	841	976	1111	1245	1380	1514	1649	1784	1918
11%	a	318	348	378	407	437	467	497	528	558
	b	216	237	257	277	297	317	337	357	377
	c	1037	1184	1332	1481	1629	1777	1922	2069	2221
12%	a	357	390	422	455	486	519	551	583	615
	b	243	265	287	309	330	353	375	397	419
	c	1232	1393	1555	1716	1872	2040	2196	2354	2524
13%	a	396	432	467	502	537	572	607	642	676
	b	270	293	317	341	365	389	408	432	456
	c	1427	1602	1777	1952	2127	2302	2469	2639	2826
14%	a	436	473	512	549	587	625	663	701	739
	b	296	322	348	373	399	425	452	459	485
	c	1622	1811	1998	2188	2376	2564	2744	2924	3128
15%	a	475	515	556	596	637	677	718	758	799
	b	323	350	378	405	433	461	488	516	543
	c	1817	2020	2221	2424	2625	2827	3029	3231	3433
16%	a	514	557	605	644	687	729	771	814	856
	b	349	379	408	438	467	498	528	558	588
	c	2013	2228	2443	2658	2874	3092	3307	3521	3736
17%	a	553	599	645	691	737	783	829	875	921
	b	376	407	438	470	501	532	564	595	627
	c	2208	2437	2666	2894	3123	3352	3570	3799	4027
18%	a	592	641	692	738	787	837	886	936	981
	b	403	436	471	502	534	567	600	633	667
	c	2403	2645	2883	3130	3373	3616	3858	4101	4344

**Planet**  
**Copper Mining Company**  
**74 Broadway, New York**

# Planet Copper Mining Company

INCORPORATED UNDER THE LAWS OF ARIZONA

*CAPITALIZATION \$1,500,000*

*Divided into 150,000 Shares, Par Value \$10 per Share  
Full Paid and Non-assessable*

## *Officers and Directors*

CHARLES S. BARTON, PRESIDENT - - WORCESTER, MASS.  
President and Treasurer, Rice, Barton & Fales Machine and Iron Co.

WILLIAM G. NICKERSON, VICE-PRESIDENT - - BOSTON, MASS.  
Of the firm of Hamlin, Nickerson & Company, Members  
New York and Boston Stock Exchanges

O. J. ASHMAN, SECRETARY & TREASURER 74 BROADWAY, NEW YORK

GEORGE CROMPTON - - - - WORCESTER, MASS.  
Crompton & Knowles and Crompton & Thayer Looms Works

ALEXANDER RAE, M. D. - - - - BROOKLYN, N. Y.

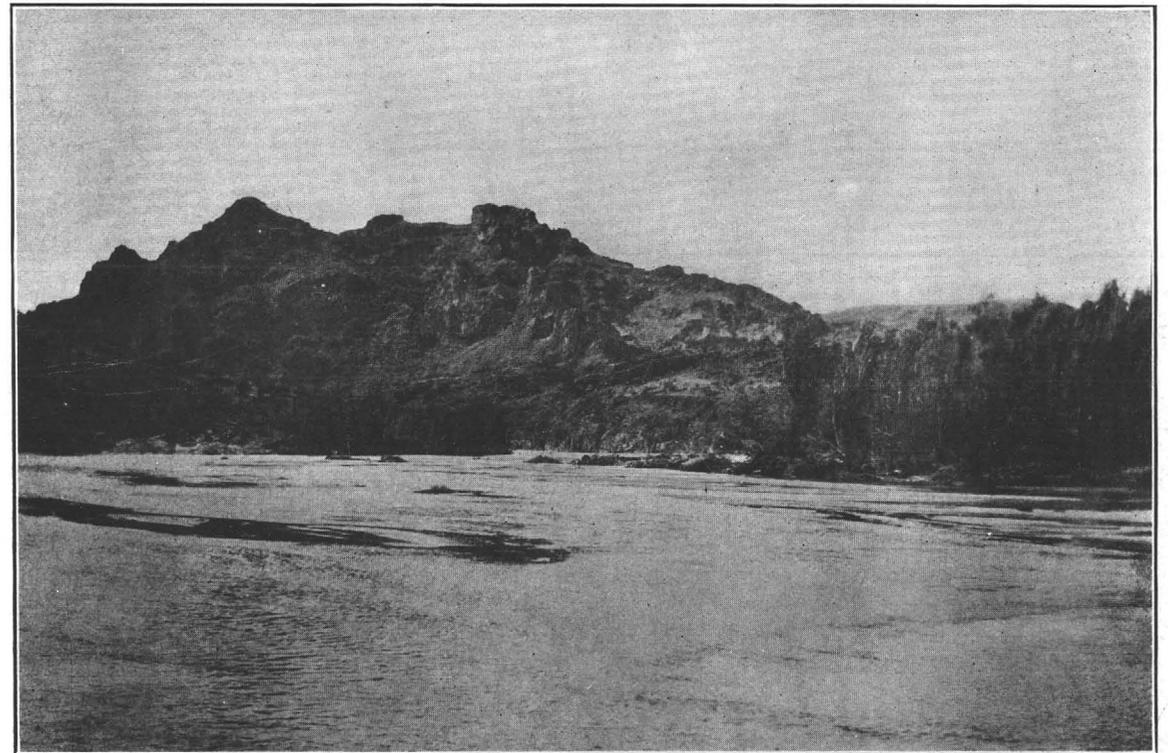
## *Registrar of Stock*

CITY TRUST COMPANY OF BOSTON, BOSTON, MASS.

## *Company's Depository*

HAMILTON TRUST COMPANY, BROOKLYN, N. Y.

PRESCOTT NATIONAL BANK, PRESCOTT, ARIZ.



BILL WILLIAMS RIVER AT THE PLANET MINE, TAKEN WHILE IN FLOOD.

The Directors of the Company and a few of their friends and associates have furnished all of the capital expended to date.

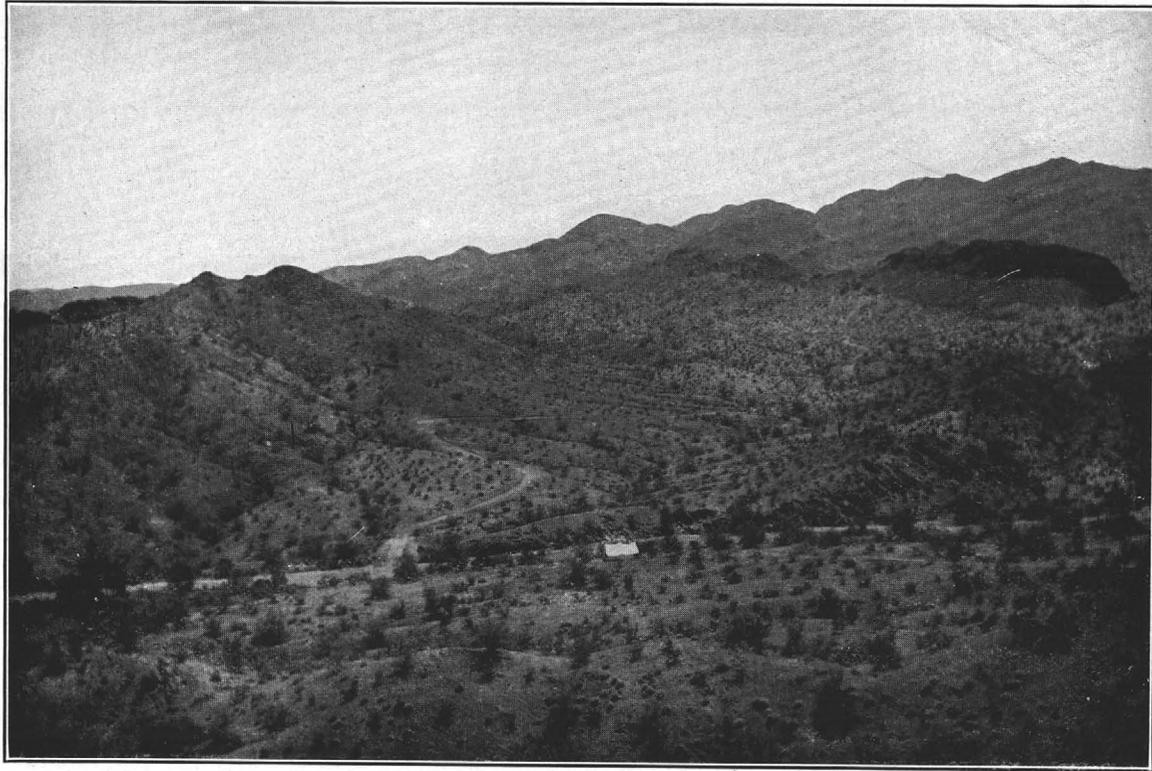
The future policy of the Directors will be to conduct the further development of this great property along the same conservative lines and on as strictly a business basis as their respective commercial enterprises.

Mining engineers of national reputation have examined the Planet Mine, and unhesitatingly say that the ore bodies already exposed and blocked out are of such large and generous proportions and present actual value, that the whole problem is one calling, not so much for the exercise of caution as for a most liberal expenditure of funds, conducted along intelligent lines.

The extent and high grade character of the Planet ores, the unlimited quantity of fluxing material, the possession of fine timberland and an adequate supply of water at all times, for mining and smelting purposes, are conditions which will enable the Planet Company to become a large producer and reach a dividend paying basis without the enormous expenditure of capital, usually required for the development of most copper mines.

For further information, address

PLANET COPPER MINING COMPANY,  
74 BROADWAY, NEW YORK.



GENERAL CHARACTER OF THE COUNTRY AROUND THE PLANET MINE.

to the Planet property. Final surveys are now being made by the Santa Fé Company. The completion of this road will enable the Planet Company to immediately enter the market with a large tonnage of both copper and iron ores.

#### SMELTING

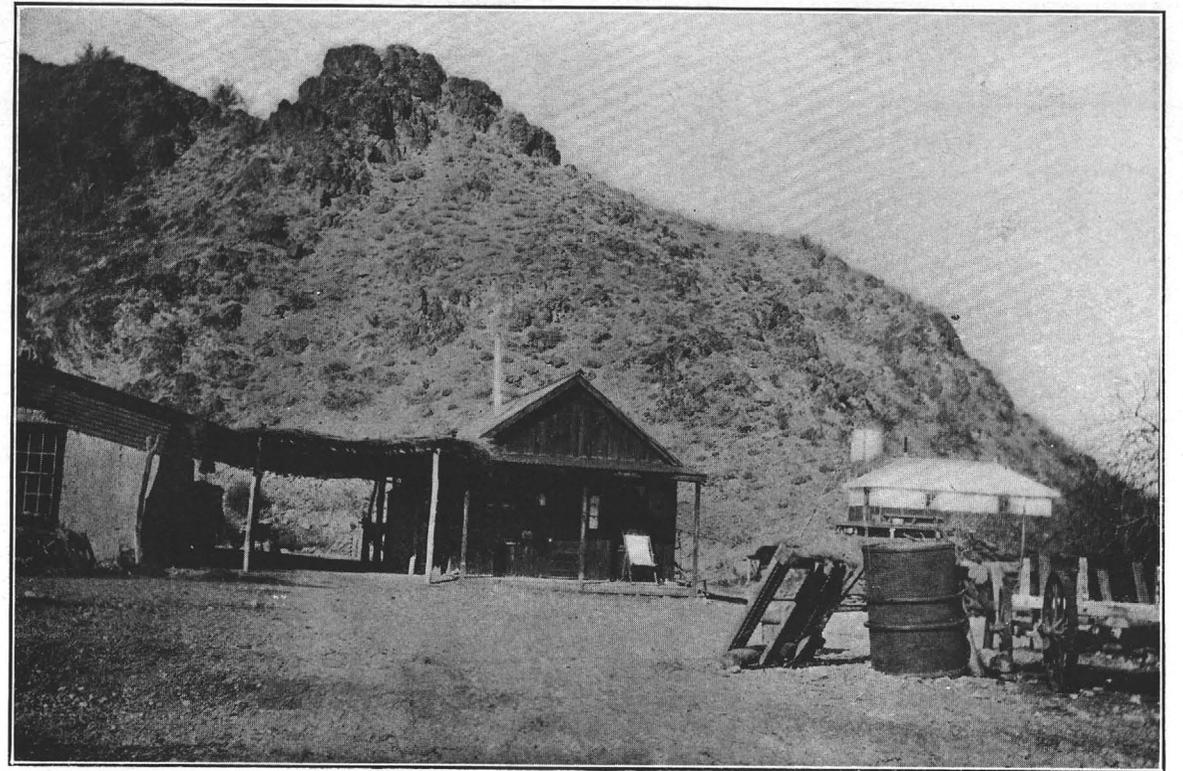
A 300-ton Copper Smelter is now being erected within 12 miles of the Planet Mine. The Planet Company will probably ship all of its copper ores to one of the custom smelters, thereby saving the time and expense which would be incurred in the erection of its own plant. However, should it prove to be more profitable to smelt on the property, the Company will erect its own smelter. The Company owns two mill sites, each of which is an ideal location for large smelting works.

#### WATER AND TIMBER

The Bill Williams River, which adjoins the Planet property on the north, has a perpetual flow of pure water, sufficient at all times for mining, smelting and domestic purposes. The Company also owns a valuable section of timberland, on which grows an abundance of cottonwood, iron-wood and mesquite trees, which make excellent fuel for steam purposes.

#### MANAGEMENT AND CONCLUSIONS

The Planet Company, since its organization, has been conducted as a close corporation and has expended thousands of dollars in opening up and blocking out the ore bodies referred to.



MINE OFFICE.

#### LOCATION OF THE PLANET MINE

The property is located in Yuma County, Arizona, on the south side of the Bill Williams Fork River, twelve miles east of its junction with the Colorado River. The Company holds deeds and clear titles and owns over 600 acres of rich mineral land embracing 31 lode claims, three placers and two mill sites.

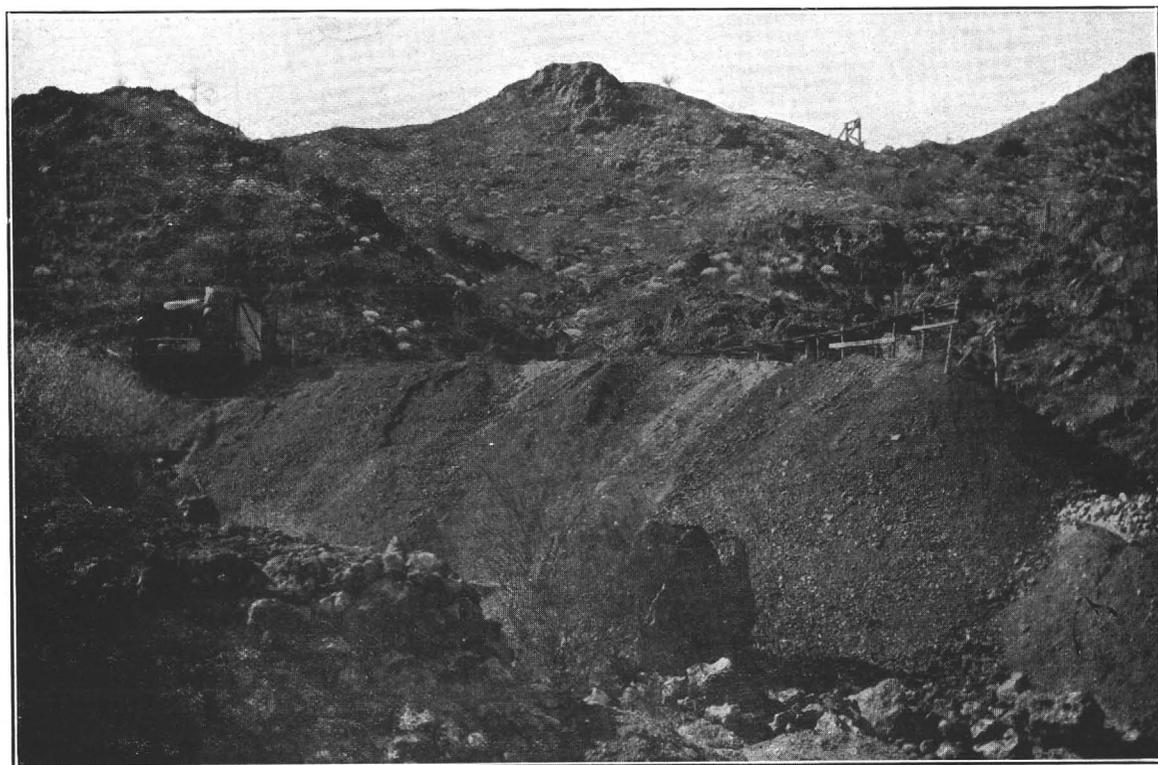
#### GEOLOGY

The Planet ore bodies are found in a metamorphic contact formation between diorite (the floor or foot-wall) and impure limes altered by a later eruptive than the basal diorite. The formation is probably precambrian, and is made up of shales and impure limestones, metamorphosed into slaty and schistose rocks with intrusive igneous material, the whole often being interwoven as if kneaded together, but, as a rule, the sedimentary character of the formation is plain. \* \* \* An iron cap, averaging from 20 feet to 30 feet in thickness has been exposed for a length of 3000 feet, under which the copper ores are usually found.

The surface ores consist of many different forms of copper silicate, but carbonates predominate at the depth of 300 feet. Copper glance, (chalcocite) is also a notable feature.

#### DEVELOPMENT

The Planet Mine is developed by 12 shafts, 4 inclines, 8 tunnels, and 6000 feet of underground workings. The machinery consists of a new five-drill air compressor and engine, with a capacity to run four drills; a 22 H. P. and a 12 H. P. Fairbanks and Morse gasoline hoist, also



SHAFT NO. 1 ON PLANET CLAIM. SHOWING ORE DUMP.

a complete American Diamond Rock Drilling Plant; surface improvements include smithy, assay office, boarding house and three dwellings. The machinery is enclosed within substantial buildings.

The main copper bodies lie under a heavy capping of hematite, (oxide of iron) opened up and exposed for a length of 3000 feet and from 300 to 400 feet in width. The average grade of the copper ore throughout this distance is between 6% and 8%, with occasional bodies running much higher. Neither the length nor the width of this zone has as yet been determined. **The Planet Company owns all of the ground for one mile ahead of the present workings**, into which these ore bodies are trending.

The incline and lower workings on the Planet, Mark Hanna and Bill Williams claims, starting at shaft No. 1 (refer to map of workings inside of back cover) has been driven in a south-westerly direction for a distance of 700 feet, with various cross-cuts north and south. These workings are in copper ore averaging 6%, the various cross-cuts opening up the ore bodies from 60 feet to 120 feet in width.

A new double compartment shaft 9 feet by 4½ feet in the clear, well timbered from top to bottom, has been sunk to the depth of 350 feet (at a cost of \$25,000) cutting the lower ore bodies and connecting with south drift No. 7 from lower incline. This not only affords excellent ventilation for the Mine but reduces the former cost of mining and hoisting fully 50%.

In the sinking of this shaft, three separate ore bodies were intersected, all of which lie above the lower ore bodies referred to in the southwest incline. The first was encountered at 175 feet in depth and passed through 10 feet of copper ore to 185 feet in depth, value 3.4% and



PLANET GULCH, LOOKING NORTH FROM NEW INCLINE.

### PRESENT TONNAGE AND FUTURE VALUES OF THE ORE BODIES

Owing to the lack of railroad facilities in the past, the Planet Company has pursued the policy of developing the Mine to an extent that would justify the building of an independent railroad. This road is now warranted, as the Planet Mine at present can supply a daily output of 200 tons of high grade copper ore, averaging from 6 to 8% copper, 200 tons of fluxing ore and 500 tons of high grade Bessemer iron ore.

When one considers that the regularity of the formation indicates that these ore bodies extend a mile further under the highest mountain in the Planet group, it is conservative to estimate that the future values of the ores hereafter to be mined, will run up into the millions.

### RAILROADS

The California and Arizona Railroad (owned and controlled by the Atchison, Topeka and Santa Fé Railway Company), now being built from Wickenburg, Arizona, to Amboy, California, to connect at that point with the main line of the Santa Fé, has been completed and is operating to Parker, Arizona, a small town on the east bank of the Colorado River, 25 miles from the Planet Mine.

### RAILROAD TO THE PLANET MINE

Negotiations have recently been entered into with the Santa Fé Railway Company for the construction of a branch line from a point near Bouse on the California and Arizona Railroad



PLANET IRON CAP, LOOKING NORTH TO BILL WILLIAMS RIVER.

The Colorado Fuel and Iron Company would have used 150,000 tons of this iron that year had the Planet Company been provided with railroad facilities.

Dr. W. S. Ward, Mining Engineer (Statistician for the United States Geological Survey for the State of Colorado), was the engineer employed by the Colorado Fuel and Iron Company to examine the Planet property.

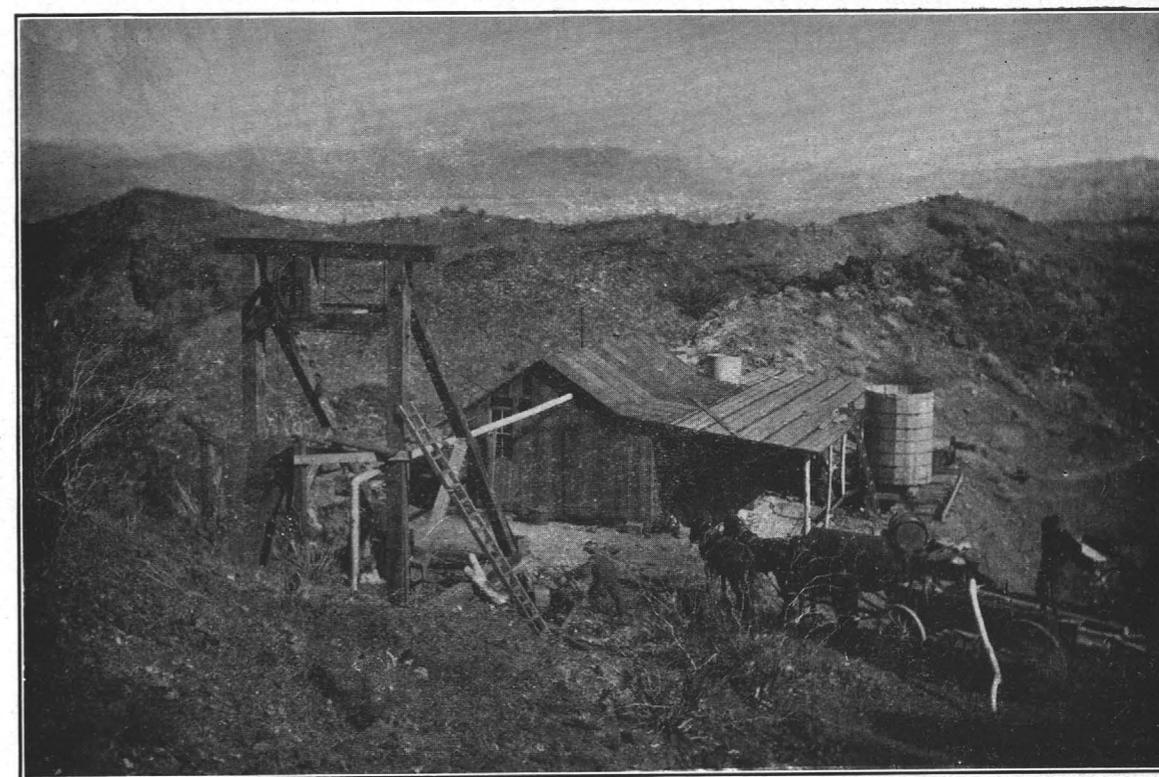
The iron body 20 feet thick, which was intersected in the sinking of the new shaft is about 450 feet in distance from the workings which were examined by the Colorado Fuel and Iron Company and is the continuation in width of the same ore deposit.

Oscar H. Reinholt, Mining Engineer (Superintendent of the Government explorations in the Philippines, 1903 to 1904), reported on August 25, 1906, that the "Planet Mine is capable of supplying the iron needed during the next twenty years, for the production of all the pig iron consumed in any form on the Pacific Coast, even allowing for a slight increase during that period."

Herman A. Keller, Mining Engineer and Metallurgist, reports the following analyses from samples taken by him:—

Specular ore, black, from incline near face of iron drift half way down:	Specular ore from iron drift half way down between face and east drift:	Black hematite, taken from the east drift half way in:
Iron.....62.176%	Iron.....68.885%	Iron.....68.125%
Silica ..... 9.280%	Silica..... 0.453%	Silica..... 0.890%
Phosphorus..... 0.022%	Phosphorus..... 0.031%	Phosphorus..... 0.051%

In addition to the high grade copper ores and pure hematite ores, the Planet Mine has an abundance of fluxing material (copper-iron ore), which is in great demand at the custom smelters within shipping distance of the property.



NEW DOUBLE COMPARTMENT SHAFT 350 FEET IN DEPTH, EQUIPPED WITH FIVE-DRILL AIR COMPRESSOR AND HOIST.

5.56% copper with 48% of iron. At this depth the shaft passed into a silicious lime zone for 45 feet and then at a depth of 230 feet into another copper body 24 feet thick, terminating at 254 feet. From 230 feet to 237 feet the ore assayed 4.77% copper; from 237 feet to 254 feet the assays ran from 5% to 9% copper, with gold running from 40c. minimum to \$3.30 maximum; from 254 feet to 290 feet the shaft passed through schist; then from 290 to 310 feet the main iron zone was encountered, cutting a solid body of iron 20 feet thick. Below this point the lower ore bodies of the southwest incline were intersected, the shaft passing through copper ore 15 feet thick, assaying from 5% to 8% copper, and a high iron content. Then came a talcose gangue from 325 feet to 350 feet.

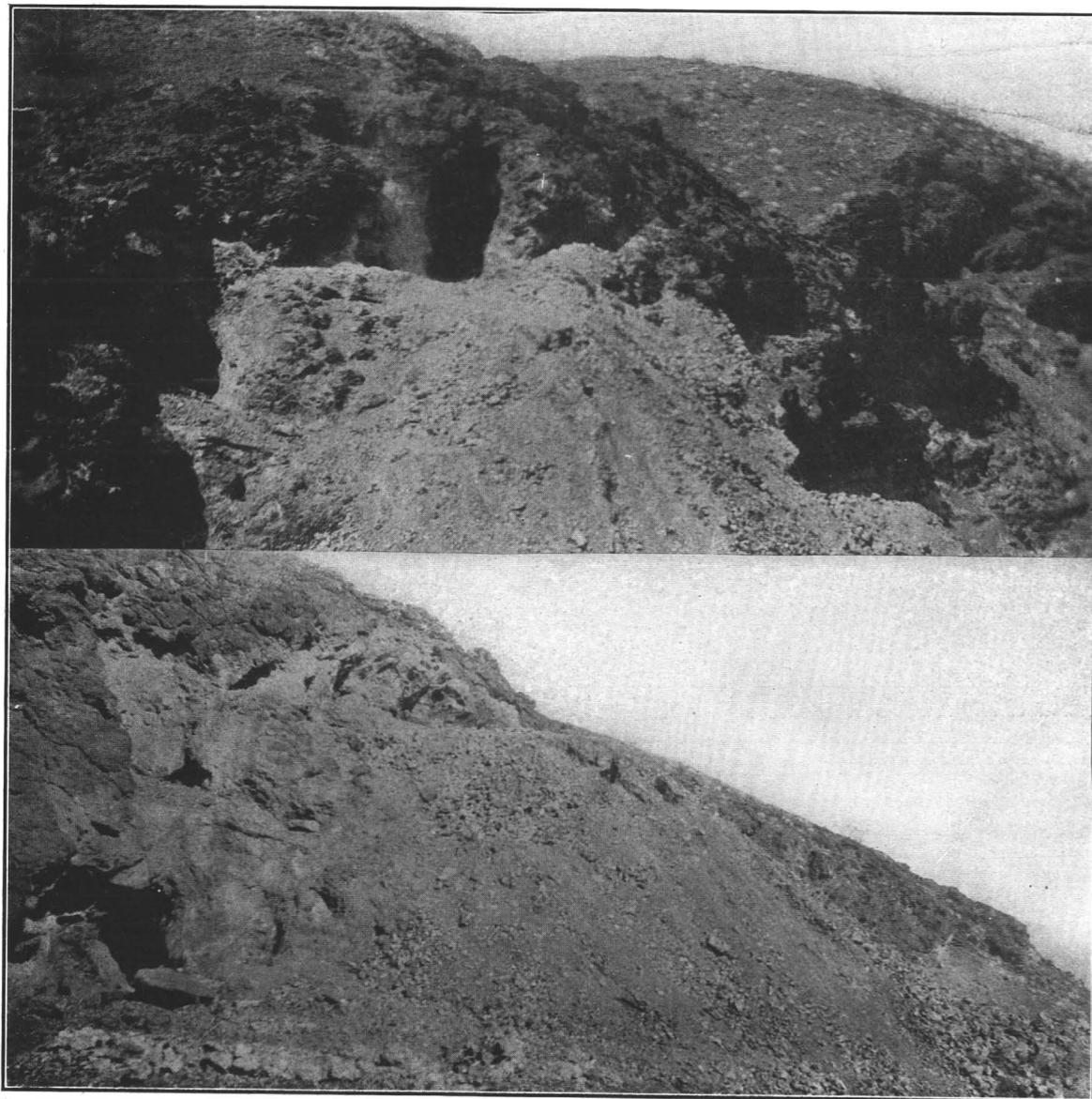
All of the upraises from the incline workings near the shaft show copper ore, assaying 8%. These ore bodies are on the same level with the lower copper body in the shaft. Drifts from the shaft will connect all these workings.

#### SENTINEL MOUNTAIN, ELLA BELLE, BLUE BIRD AND ASHLEY WORKINGS

Considerable exploration work has been done on these claims, more with the view of determining the continuity of the ore zone, than for the purpose of blocking out ores, and has proven that a large tonnage of high grade copper ore can be depended upon.

Four tunnels were run in on the Sentinel claim from Planet Gulch side and each one of these encountered ore of good quality, the general average yielding 10% copper.

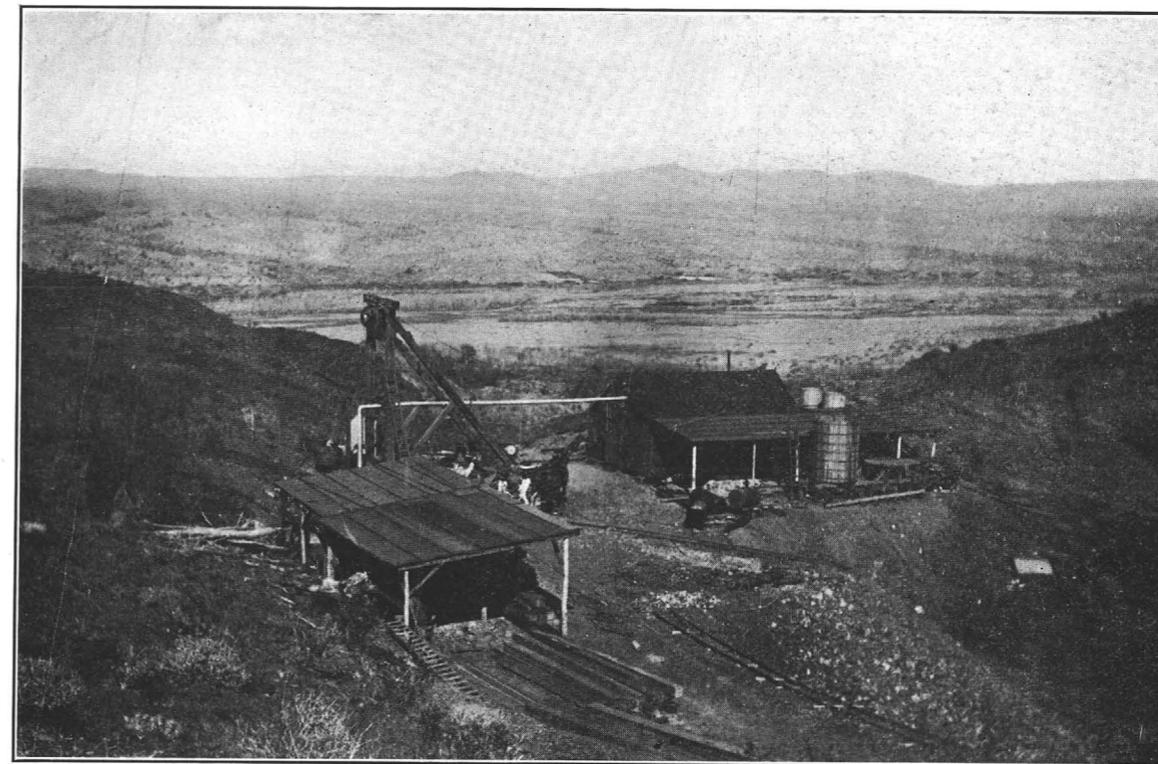
This development indicates that there is ore extending from the Smelter Gulch side of Sentinel Mountain clear through the mountain, dipping 15 degrees to the southwest, and con-



TWO VIEWS OF THE ASHLEY CLAIM, SHOWING ORE DUMPS.

stituting a part of the main Planet ore zone, the continuity of which has been proven, for over 3000 feet in length.

This development will be continued until at least two of the tunnels pass through the mountain from Planet Gulch to Smelter Gulch. One of these tunnels is now over 100 feet in length, encountering ore at 70 feet from the mouth; at 90 feet from the mouth a winze was sunk and is in ore 13 feet thick; another tunnel was started 150 feet north of this and 25 feet lower in the mountain side, and struck the same ore body 37 feet from the opening. A cross-cut is being made to connect these two, and is in ore 15 feet thick. The third tunnel was started lower down the mountain and reached the ore in 70 feet.



NEW WORKING SHAFT LOOKING NORTH.

This development is not regarded as a new "Strike" but simply the continuation of the main Planet ore zone, which outcrops on the northeast corner of the Sentinel claim and cuts the Planet claim obliquely in a southwesterly direction, and thence passes into the Ashley, Mark Hanna and Bill Williams claims, as indicated by the maps and plans.

### IRON

The enormous iron capping (before referred to) which overlies the main copper bodies, averages from 20 feet to 30 feet in thickness and has been opened up in length for a distance of 3000 feet and from 300 feet to 400 feet in width. This iron is of peculiarly fine quality for fluxing purposes and Bessemer steel.

THE COLORADO FUEL AND IRON COMPANY examined these iron bodies in May, 1906, and their engineer reported that there was at that time several hundred thousand tons of iron blocked out, with a probable unlimited quantity and that it was one of the largest and purest deposits of high grade Bessemer iron to be found in the southwestern part of the United States.

The following shows the result of their analyses:—

Analyses made of the iron exposed in the main workings gave the following general average:

Iron.....	62.00 %
Silica.....	5.00 %
Phosphorus .....	0.030%
Sulphur .....	trace

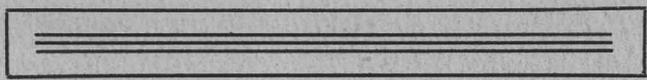
This same Company had previously made two analyses, obtaining the following results:—

	1	2	
Iron .....	62.42 %	Iron .....	65.48 %
Silica .....	12.84 %	Silica .....	7.00 %
Phosphorus .....	0.018 %	Phosphorus .....	0.031 %

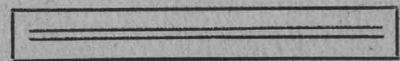
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**Planet**  
**Copper Mining Company**

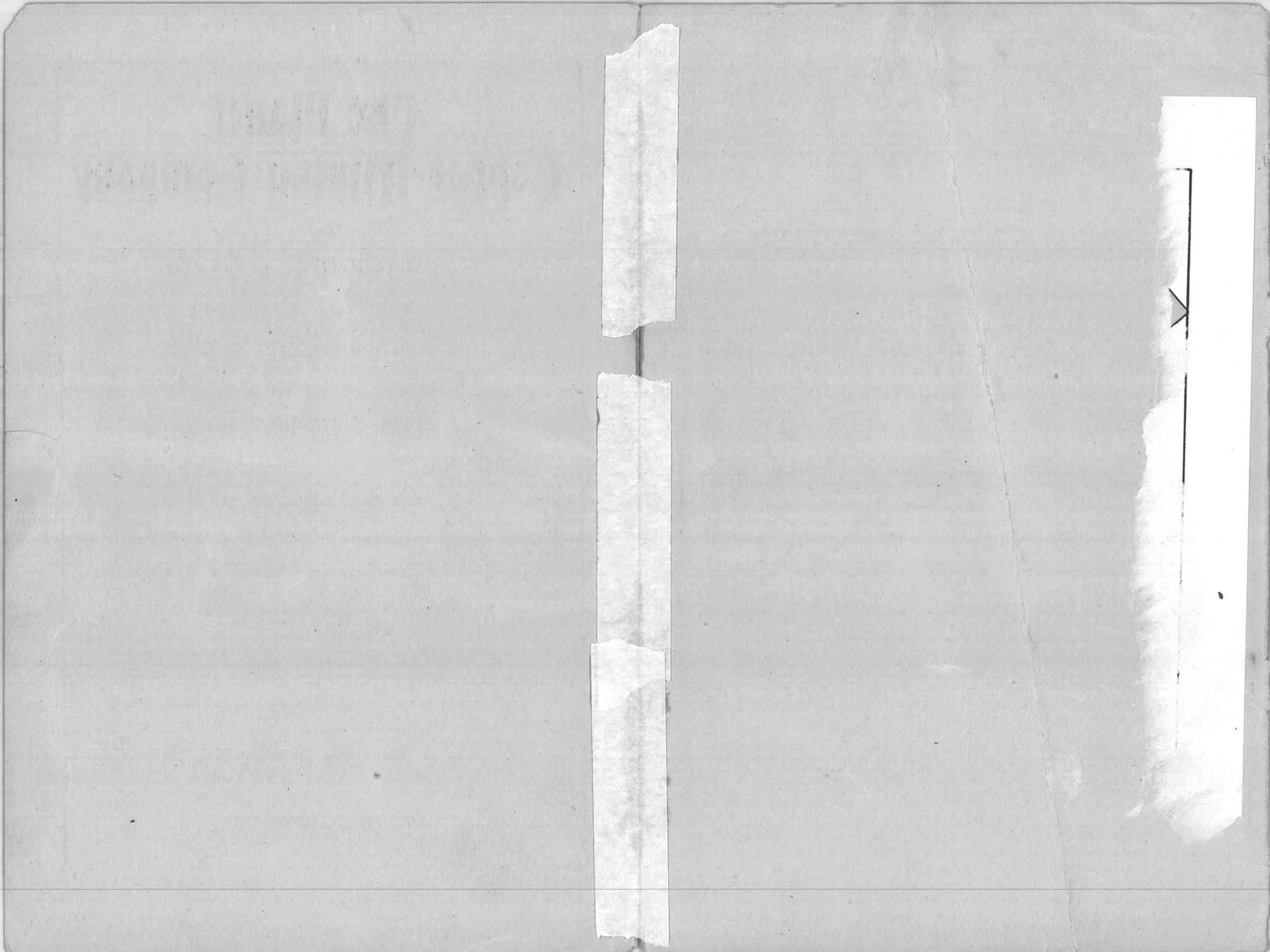
Mines  
Yuma County, Arizona



Probably <sup>about</sup> 1907



**O. J. Ashman**  
76 William St.  
New York City



chute of good copper ore, as yet of unknown length. Cross-cuts "P" and "Q" are in hematite, indicating the iron to be between 30 and 40 feet in thickness. The various shafts, tunnels and workings on the "Ella Belle," "Sentinel," "La Mexicana," "Blue Bird" and "Copper Hill" claims, expose several feet of copper ore that will carry from 6 to 25% copper.

A general analysis of this ore, carrying, say, 10% copper, will show 14% iron, 44% silica and between 1 and 2% lime. Ore of this nature mixed with the lime ore shown in stope "D," would, I should judge, make a self-fluxing mixture, admirable for smelting purposes. Should more iron be required, however, the mine has unlimited quantities of it available.

As stated above, the mine has such a combination of limestone, iron and salicious ores that it would undoubtedly afford a self-fluxing mixture, requiring no barren flux whatever, and no trouble would arise, I apprehend, in running the ore into black copper of 97% to 98% fineness.

**CONCLUSIONS.**

This property, in my opinion, has features of large and generous proportions and, as a whole, it has strong indications of becoming a large, paying mine and that it fully warrants extensive developments. The habit of large copper mines, especially in Arizona and Mexico, to be associated with extensive hematite surface croppings, makes it an attractive proposition on this feature alone and with the more important feature that copper ore from 6% to 25% has already been opened up in perhaps 20 different places on the property in direct connection with the hematite, shows it to be a mineralized zone of extensive proportions.

The work appears to be well laid out and I think is fully justified by conditions.

Viewing the property as a whole, the prospects are good, and thorough and properly directed development work will, at a moderate expense, put the mine on a paying basis, especially with the materialization of nearer railroad connections, which now looks assured.

Respectfully,

(Signed) EDWIN E. CHASE,  
Mining Engineer.

Denver, Colorado, June 17, 1905.

# The Planet Copper Mining Company

THE PLANET COPPER MINING COMPANY WAS INCORPORATED IN 1902,  
UNDER THE LAWS OF ARIZONA.

**CAPITALIZATION \$1,500,000**

**Divided into 150,000 Shares, Par Value \$10 per Share  
Full Paid and Non-assessable**

## Officers and Directors

- J. STANLEY JONES, PRESIDENT .. .. . PLANET, ARIZONA  
Mining Operator, 25 years' experience.
- CHAS. S. BARTON, VICE-PRESIDENT .. .. . WORCESTER, MASS.  
Director, Worcester Trust Company;  
Pres't & Gen'l Manager, Rice, Barton & Fales, Manufacturers of Paper Machinery.
- W. B. STORER, SEC'Y & TREAS. .. 74 BROADWAY, NEW YORK, N. Y.
- HON. JOHN N. PARTRIDGE.. .. . BROOKLYN, N. Y.  
Director, Hamilton Trust Co., Brooklyn;  
Ex-Pres't, Coney Island and Brooklyn R. R. Co.;  
Ex-Sup't, Public Works, State of New York.
- WILLIAM G. NICKERSON .. .. . BOSTON, MASS  
Of the firm of Hamlin & Nickerson, Members of both the New York  
and Boston Stock Exchanges.
- W. H. POWELL .. .. . NEW YORK, N. Y.  
Pres't and Gen'l Manager, Excelsior Terra Cotta Co.,  
1170 Broadway, N. Y. City.

## Registrar of Stock

CITY TRUST COMPANY OF BOSTON, BOSTON, MASS.

## Company's Depository

HAMILTON TRUST COMPANY, BROOKLYN, N.Y.

# The Planet Copper Mining Company.



PLANET IRON CAP, LOOKING NORTH TO BILL WILLIAMS RIVER.

## LOCATION OF THE PLANET MINE.

**T**HE property is located in Yuma County, Arizona, on the south side of the Bill Williams Fork River, twelve miles east of its junction with the Colorado River. The present company holds deeds and clear titles and owns, free from debt or encumbrance of any kind, over 600 acres, embracing 25 lode claims, three placers and two mill sites.

## GEOLOGY.

The Planet ore bodies are found in a metamorphic contact formation between diorite (the floor or foot-wall) and impure limes, altered by a later eruptive than the basal diorite. The formation is probably pre-cambrian, and is made up of shales and impure limestones metamorphosed into slaty and schistose rocks with intrusive igneous material, the whole often being interwoven as if kneaded together; but, as a rule, the sedimentary character of the formation is plain. \* \* \* An iron cap, averaging 30 feet in thickness, has been exposed for a length of 3,000 feet, under which the copper ores are usually found.

The ores consist of many different forms of copper silicate, carbonate and other oxidized ores constituting the greater portion of the surface ores, but showing copper glance and sulphide at the depth of 200 feet.

Although having no special bearing on the points to which reference has been made, the accompanying photographs may be of interest.

Trusting that I have, in the main, made myself clear in connection with the question in review and placing myself at your service wherever I have failed to properly explain or state my position, believe me,

Yours respectfully,

(Signed) W. S. WARD,

Mining Engineer.

118 Boston Building.

## EXTRACTS FROM THE REPORT OF E. E. CHASE, M. E.

Under Date of June 17, 1905.

To The PLANET MINING COMPANY.

Dear Sirs: In compliance with your instructions that I make an examination of your property in Arizona, for the purpose of advising upon development work and the opening up of ore bodies thereby, I have examined the grounds thoroughly, taken numerous samples to check your assaying done at the mine and herewith submit my report of the conditions found and the conclusions arrived at.

## GEOLOGY.

The ore bodies, in their undisturbed condition, occur in a zone about 100 feet in thickness, having a trend of about N. 30 degrees E., and a westerly dip of about 15 degrees from the horizontal. This zone lies between diorite rock underneath and schist rock overhead. The zone itself consists of altered diorite and schist, some limestone and extensive bodies of hematite (oxide of iron), which form a black, conspicuous capping at the surface.

The ore is usually a silicate of copper with some oxide and is associated with hematite and sometimes with limestone. The new workings on the Mark Hanna claim are beginning to show chalcopryrite ore mixed in with the silicate and copper oxide. This work is also demonstrating that the extensive body of hematite found on the Planet and Sentinel claims is continuing, unbroken, to the mountain west of Planet Gulch.

## DEVELOPMENT, ORE EXPOSURES AND ORE TREATMENT.

The most recent work has been directed toward sinking an incline shaft, 77 feet, at a point marked "M," from the bottom of which a main level has been driven southwesterly for about 600 feet, with various cross-cuts, east and west, exposing the east or lower contact of the ore zone, as shown in Figure "7." The new work referred to has developed ore from 4 to 10 feet in thickness, running from 7% to 16% in copper.

The main level and cross-cuts demonstrate the existence of a large body of apparently pure hematite, through which there extends an ore

that might exist in the mine and I was confident that were the incline continued along the lines indicated or were these winzes sunk farther to the west in its general course, the same ore body would be exposed, similar in quality and probably in dimensions.

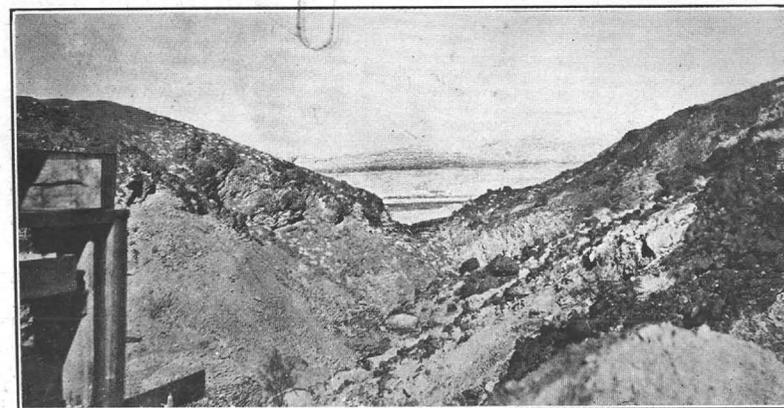
Since leaving the property, you informed me that you had sunk a winze at a point marked "J," and after passing through a body of iron, had encountered copper ore precisely similar in character and value as that exposed in the face of the incline. This was certainly to be expected and yet, was a gratifying confirmation of my previous conclusions. Had I in mind a critical examination of these copper deposits, I, myself, would have urged such an exploration as I now understand you are continuing, by means of drifts and levels from the new winze.

### CONCLUSIONS.

**FIRST:** That there exists upon the properties of the Planet Mining Company, especially on Sentinel Mountain and the other adjacent exposures, large quantities of copper ore of exceptionally high grade and easy of access, so far as exploration and mining propositions are concerned. These bodies, as previously indicated, are to be found on both the east and west sides of Sentinel Hill in the "Ella Belle" shaft and in the "Blue Bird" and the "Palmetto," and also of exceptional promise in the openings in the "La Mexicana." In addition to these, you have also exposed a promising ore body on the southeast side of Planet Gulch on the Boston claim. A careful but necessarily somewhat superficial examination of these exposures, justifies me in the emphatic conclusion that the promise of subsequent values is so great as to warrant almost any legitimate expenditure in the further exploration of these bodies, which, in order to distinguish them from the deeper exposures in the Planet, might be indicated as comparatively superficial, so far as surface depths go, but giving promise of very extensive yields.

**SECOND:** The exposures as made in the main workings of the Planet Mine are of a character to justify much more confident conclusions as to the possibilities of their continuance and value. Here the body lies in a fixed position, homogeneous in character, extending over a decided area and capped by a perfectly legitimate known formation, such as would apparently justify the conclusion that a continuous body of copper ore, having a value of not less than 7% may be counted upon.

I would state, unhesitatingly, that the ores exposed on the properties of the Planet Copper Mining Company are certainly of a character to justify a most generous estimate of future possibilities as well as present actual quantity, and hence, that the whole problem is one calling not so much for the exercise of caution as for a liberal expenditure conducted along intelligent lines.



PLANET GULCH, LOOKING NORTH FROM NEW INCLINE.

### DEVELOPMENT.

Development by 12 shafts, 4 inclines and 8 tunnels with about 5,000 feet of underground openings, has 12 H. P. and 22 H. P. Fairbanks and Morse gasoline hoists, also complete American Diamond Rock Drilling Plant; surface improvements include smithy, assay office, boarding house and three dwellings.

The main ore body lies directly under a heavy capping of hematite (oxide of iron) opened up and exposed for a length of 3,000 feet. The average grade of the copper ore throughout this distance is between 7 and 8% with occasional bodies running 15 to 20%. Neither the length nor the width of this zone has as yet been determined.

When one considers that a million dollars' worth of ore has already been mined from an area on this zone not exceeding 500 feet in length, and that the regularity of the formation indicates the ore bodies to extend a mile further under the highest mountain in the Planet group, without deviating from their known course, it is conservative to estimate that the value of the copper ore hereafter to be mined will run up into the millions.

This ore body is also passing around the westerly side of the iron in the direction of the Bill Williams and Ashley claims, towards and into a great basin in the Bill Williams and Bunker Hill claims. The surface rock of the Ahonica and the Bunker Hill claims dips southeasterly, and the formation of the Planet and the Mark Hanna claims dips westerly, forming this great trough or basin into which the copper ore is trending.

These conditions so strongly favor the concentration of copper, that during the coming fall the Planet Company will use a diamond drill in proving up the continuity of this great ore zone, to enable the management to select the proper place at which to sink a deep shaft to reach

and mine the copper sulphide zone now being approached by the south-west incline.

There is now being blocked out and placed in sight, each month, copper ore exceeding \$25,000.00 in value, besides hoisting and placing on the dump, ready for treatment, ore worth more than the entire cost of development. The production from this incline can be doubled if not trebled as soon as the new shaft is completed.

## RECENT DEVELOPMENT OF THE SENTINEL CLAIM.

Four tunnels were run in on the Sentinel claim from the Planet Gulch side, and each one of these encountered ore of good quality, the general average yielding over 10% copper.

This development indicates that there is ore extending from the Smelter Gulch side of Sentinel mountain clear through the mountain, dipping 15 degrees to the southwest, and constituting a part of the main Planet ore zone, the direction and continuity of which has been proven for over 3,000 feet in length.

This development work will be continued until at least two of the tunnels pass through the mountain from Planet Gulch to Smelter Gulch. One of these tunnels is now over 100 feet in length, encountering ore at 70 feet from the mouth; a winze 13 feet deep was sunk at 90 feet, and is in solid ore; another tunnel was started 150 feet north of this and 25 feet lower on the mountain side, and struck the same ore 37 feet from the opening. A cross-cut is being made to connect these two, and is in solid ore 15 feet thick. The third tunnel was started lower down the mountain and reached the ore in 70 feet. The fourth tunnel was started about 50 feet north of number 3 and is now being extended to determine the northern limit of the ore. The average value of this entire ore body is at least \$30 per ton.

This most recent development is not regarded as a new "strike" but simply the continuation of the main Planet ore zone, which out-crops on the northeast corner of Sentinel claim, and cuts the Planet claim obliquely in a southwesterly direction, and thence passes into the Ashley and Bill Williams claims, as indicated by our maps and plans.

## IRON.

Another factor of great importance is the enormous iron capping which overlies the main bodies of copper ore. This iron averages 30 feet in thickness and is of peculiarly fine quality for fluxing purposes, and also for Bessemer Steel.

You will note that with such results as these assays indicate, I feel entirely justified in offering a most encouraging opinion as to the possibilities of the output and values with continued exploration and will refer to this matter in my final general suggestions.

My observations as to the second class of ore, to which reference has been made, I regard as of much more significance and promise, referring, as they do, to a more careful and critical examination of ore bodies exposed in the lower workings of the Planet Mine and from which workings I took samples with some special regard as to the estimate of their value and extent. The points from which these samples were taken are indicated on sketch "B," in red. Descending the incline shaft, I noted that at a depth of 80 feet, after passing through a body of high grade iron ore, the main copper deposits underlying the iron was encountered and a drift started upon the same toward the south. An interesting feature of this drift near the base of the incline shaft was that the whole surface seemed to be covered with a sulphate of copper, which is a soluble salt and which does not occur in nature unless under peculiar conditions. It was perfectly evident that this sulphate of copper was due to the oxidation of a sulphide of copper, probably existing in the form of chalcopyrite, a double sulphate of copper and iron. In order to determine the value of this ore as exposed for the full height of the drift, I stripped off the sulphate from top to bottom for a height of at least 6 feet at a point marked "A" in sketch "B." This stripping exposed the original ore in the form of a chalcopyrite, but rapidly altering to a sulphate, and an assay gave the value of this sample as seven and thirty-one hundredths (7.31%) per cent.

Continuing along the drift to a point marked "B" in red, a winze has been sunk to the east and here I again sampled for a height of about 8 feet, the whole winze being in ore of this character. The result of this sample gave a copper value of 8.01%.

Continuing still farther, I encountered this incline marked "C" and descended the same for a distance of about 50 feet. This incline, top, bottom and sides, seems to have been entirely in ore of a similar character to that indicated before and a general and carefully chosen sample for a number of places along this incline gave, as a result, 7.4% copper. As the distance between samples "A" and "C" was over 100 feet, and as these copper indications continued for that distance, it is very natural that I should have found myself deeply interested with the possibilities of an extension of this ore body both to the southwest on its general trend and to the west on its dip.

A full review of the maps, together with careful personal examination for further developments, indicated plainly that the main level, as shown in sketch "B," had been run over any extensive copper deposits



# THE COLORADO FUEL AND IRON CO., OF PUEBLO, COLO.

The Colorado Fuel and Iron Company, recently examined the Planet mines, and their engineer reports the following analysis of the copper and iron ore.

## COPPER.

No. 1, General samples from miscellaneous points, copper.....	20.3%
No. 2, General samples from miscellaneous points, copper.....	15.5%
No. 3, General samples from main level of incline shaft to winze.	7.5%
No. 4, General samples from Sentinel openings.....	10.5%

## IRON.

Twelve (12) analyses were made of the iron exposed in the main workings which gave the following general average:

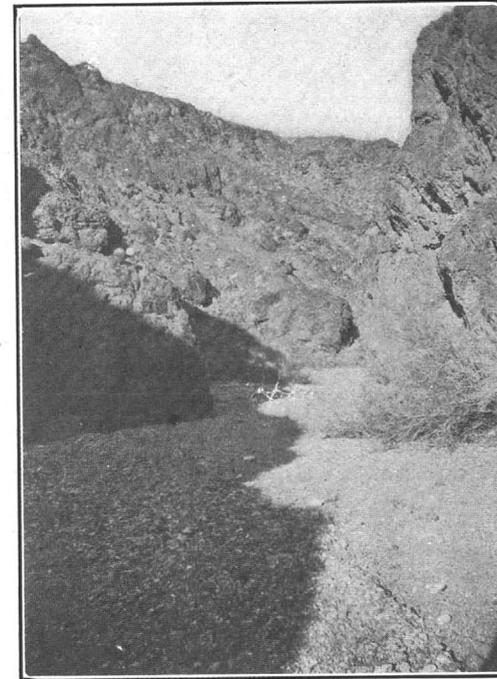
Iron .....	62.00%
Silica .....	5.00%
Phosphorus .....	trace.
Sulphur .....	none.

This same company had previously made two analyses during July, 1905, obtaining the following results:

1.	
Iron .....	62.42%
Silica .....	12.84%
Phosphorus .....	.018%
2.	
Iron .....	65.48%
Silica .....	7.00%
Phosphorus .....	.031%

DR. W. S. WARD, Mining Engineer (Statistician for the United States Geological Survey for the State of Colorado), whom the Colorado Fuel and Iron Company employed, reports, of this quality of Bessemer iron, that there is exposed and in sight practically an unlimited quantity.

OSCAR H. REINHOLT, Mining Engineer, of Los Angeles, Cal., who recently examined the property, reports, "That the Planet mine is capable of supplying the iron ore needed during the next 20 years, for the production of all the pig iron consumed in any form on the Pacific Coast, even allowing for a slight increase during that period."

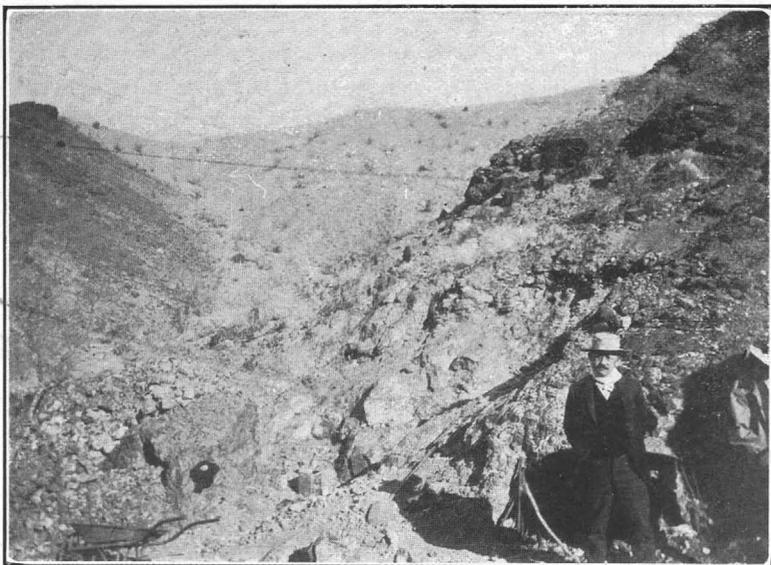


SMELTER GULCH, SIDE OF SENTINEL MOUNTAIN.

The Board of Directors recommend the stock of the Planet Copper Mining Company as a safe and conservative investment. The company being free from debt, the value of the ores already blocked out and mined, the possession of fine timber land, and a never failing supply of water, are conditions which will enable this company to reach a dividend paying basis without the enormous expenditure of capital required for many copper mines.

For more detailed information as to the Geology and ore deposits of the Planet mine, reference is made to the reports of Mr. Edwin E. Chase, M. E., and Dr. W. S. Ward, M. E., extracts of which will be found upon the following pages, also the early history and the reports regarding the Geology and mineral resources of this district, published by the United States Government, which can be had upon request. For full information regarding the sale of stock, address:

O. J. ASHMAN,  
Company's Representative,  
76 William St., New York.



BLUE BIRD CLAIM, COPPER 6 TO 10%.

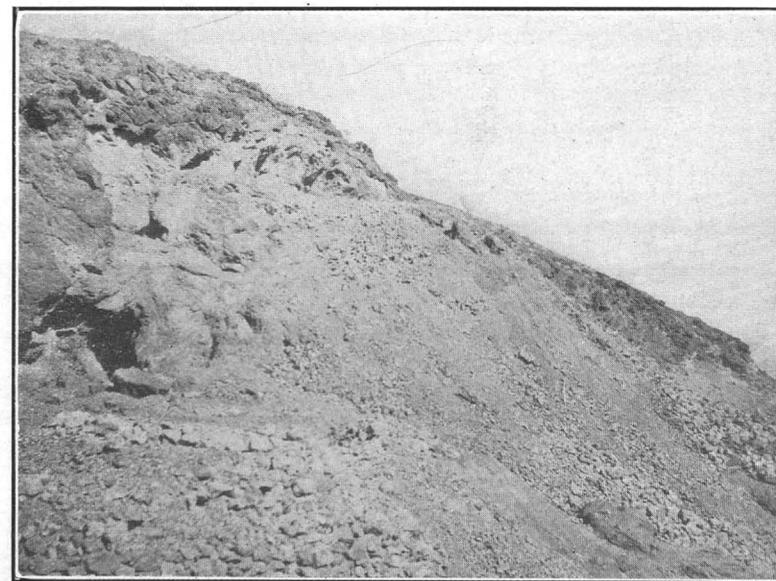
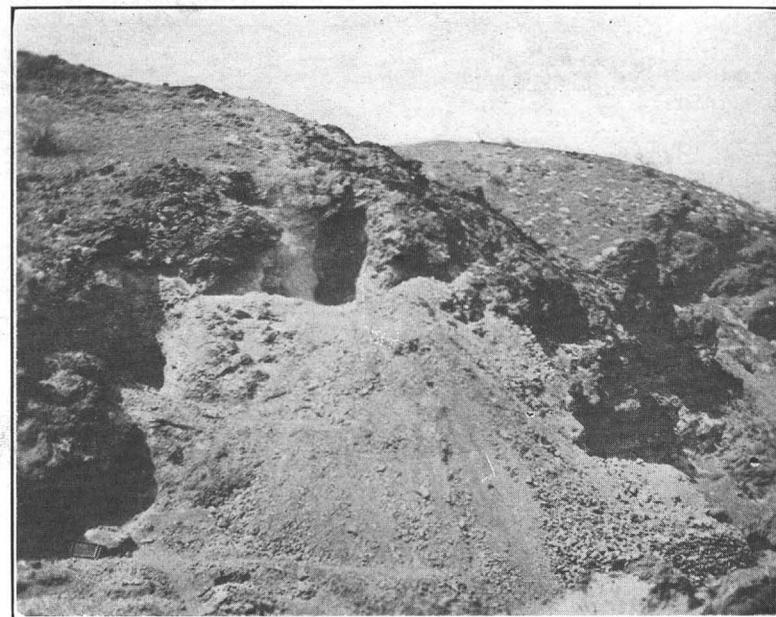
especially the territory of Arizona. As a natural consequence of this long experience, he acquired a very broad and comprehensive knowledge of the vast mineral resources of the country and examined a great many valuable mining properties, the operations of which were temporarily retarded through inadequate railroad facilities, lack of capital and poorly organized management. It was due to these conditions that he was fortunate enough to secure in 1902, such valuable mines and ore bodies as are now owned and controlled by the Planet Copper Company.

### CONCLUSIONS.

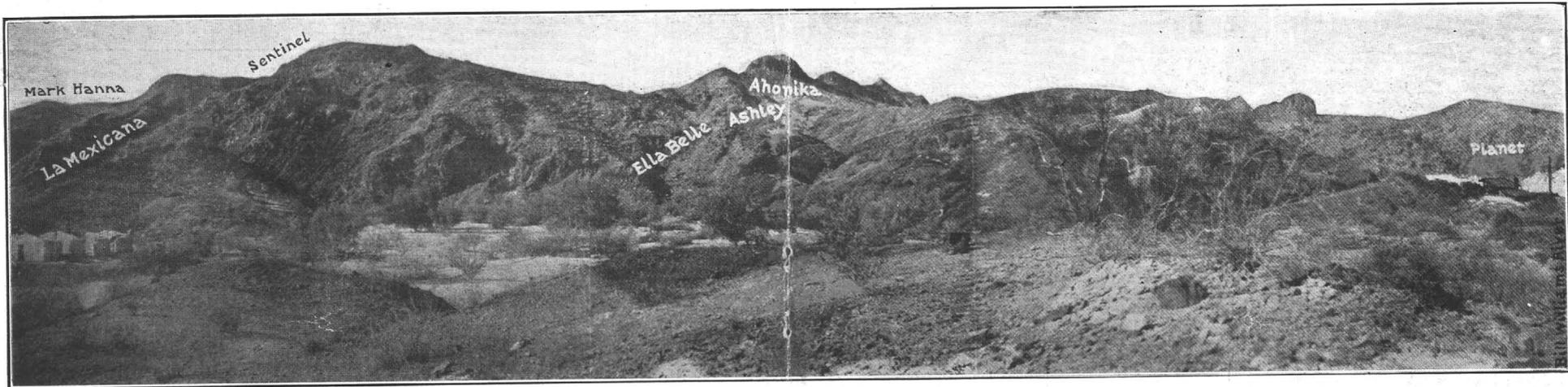
Mining engineers of national reputation, who have examined these properties, unhesitatingly say, "that the ore bodies exposed and mined on the claims of the Planet Copper Company, are of such large and generous proportions and present actual value, that the whole problem is one calling, not so much for the exercise of caution as for a most liberal expenditure of funds conducted along intelligent lines."

\* \* \*

Development work will immediately be extended upon an extensive scale in order to keep in constant reserve sufficient copper and iron ore to meet the required monthly tonnage as soon as the railroad is completed.



TWO VIEWS OF THE ASHLEY CLAIM, SHOWING ORE DUMPS.



SENTINEL MOUNTAIN, SHOWING SEVERAL OF THE COMPANY'S CLAIMS.

During the past year the Planet Company could have marketed 200,000 tons of this iron, had they possessed proper railroad facilities: this iron can be placed f. o. b. cars at the mine for much less than one dollar cost per ton.

\* \* \*

Manufacturing concerns in California have been paying \$25.00 per ton for the best pig iron.

### RAILROADS.

The California and Arizona Railroad, (owned and controlled by the main line of the Santa Fe) now being built from Wickenburg, Arizona, to Amboy, Cal., has been completed and is operating to a point known as Bouses Well, 20 miles from the Planet mines. During the past 60 days the Santa Fe Railroad Company have completed the final survey for another route from Hillside, on the Phoenix and Prescott Railroad, to the Colorado River, passing directly across the Planet property.

The completion of this road will enable the Planet Company to immediately enter the market with a very large tonnage of both their copper and iron ores, and will soon establish the Planet mine as one of the large producers of Arizona, which territory now stands second in productive capacity in the United States.

\* \* \*

Since 1894 Arizona has produced over \$180,000,000.00 worth of copper.

### MANAGEMENT.

The Planet Company, since its organization in 1902, has been conducted as a close corporation, and many thousands of dollars have been spent in bringing the property up to its present state of development. The directors have contributed over 90% of the money expended. None of the officers or directors of the company, except the superintendent at the mines, receives any salary, because of their large interests as stockholders. They are capable business men with successful records in the financial and manufacturing world and have conducted the development of this great property on as conservative lines and as strictly a business basis as their respective commercial enterprises. The company is free from debt of any nature.

\* \* \*

Another factor that also adds to the security of the stockholders is the capable and honorable management of the President of the company. Mr. J. Stanley Jones, President and General Manager, is a practical mining man of the highest standing, who has had long experience in mining, reducing and marketing ores of all kinds and is thoroughly familiar with all matters pertaining to the construction and running of plants, the treatment and extraction of the values of the ores by the most economical and modern methods. \* \* \* During the past 25 years, Mr. Jones has explored the greater portion of the Western mineral regions, including California, Colorado, Utah, Idaho, New Mexico, and

"A"

10029

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**Planet  
Copper Mining Company**

**Mines**

**Yuma County, Arizona**

*Printed 1911*