NINTH
ANNUAL REPORT

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DEPARTMENT OF
MINERAL RESOURCES

STATE OF ARIZONA

JULY 1, 1947 TO JUNE 30, 1948

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CHAS. H. DUNNING
Director

From that far off Biblical time when Tubalcain worked his brasses, to the giant modern drop forge, and all down the long ages on which history sheds a dim and murky light, runs the symphony of the metals.

Arizona's first mineral discovery by the white man was in 1583. Since statistical records have been kept the state's mines have yielded $4,069,126,899 in gold, silver, copper, lead and zinc.

"Acquisition of a thorough understanding of earth processes and geological techniques responsible for the formation of ore deposits, supplemented by geophysical techniques, would enable mining men to predict the existance of ore bodies in places where surface evidence alone does not denote their presence."

—Dr. W. E. Wrather, Director
U. S. Geological Survey

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA

Board of Governors:

Dr. N. H. Morrison, Phoenix, Arizona, Chairman
(Term expires January 31, 1951)

Edwin W. Mills, Salome, Arizona, Vice Chairman
(Term expires January 31, 1953)

Weldon C. Humphrey, Tombstone, Arizona
(Term expires January 31, 1952)

H. F. Mills, Humboldt, Arizona
(Term expires January 31, 1949)

T. E. Steele, Ajo, Arizona
(Term expires January 31, 1950)

Personnel:

Chas. H. Dunning, Phoenix, Arizona, Director
W. C. Broadgate, Prescott, Arizona, Special Assistant
A. C. Nebeker, Prescott, Arizona, Field Engineer, Northern Distict
Roger I. C. Manning, Phoenix, Arizona, Field Engineer, Southern Dist.
J. E. Busch, Tempe, Arizona, Part-time Land Specialist and Statistician, Phoenix Office
H. N. Wolcott, Phoenix, Arizona, Part-time Geologist and Engineer
George A. Ballam, Tucson, Arizona, Part-time Field Engineer
Mrs. George D. Hunt, Phoenix, Arizona, Office Secretary, Phoenix Office

Offices:

Headquarters Office

Mineral Building, Fairgrounds, Phoenix, Arizona - Telephone 4-7034

Field Office

Prescott, Arizona - Old Capitol Building

To Honorable Dan E. Garvey
Acting Governor
State of Arizona
Phoenix, Arizona

Dear Sir:

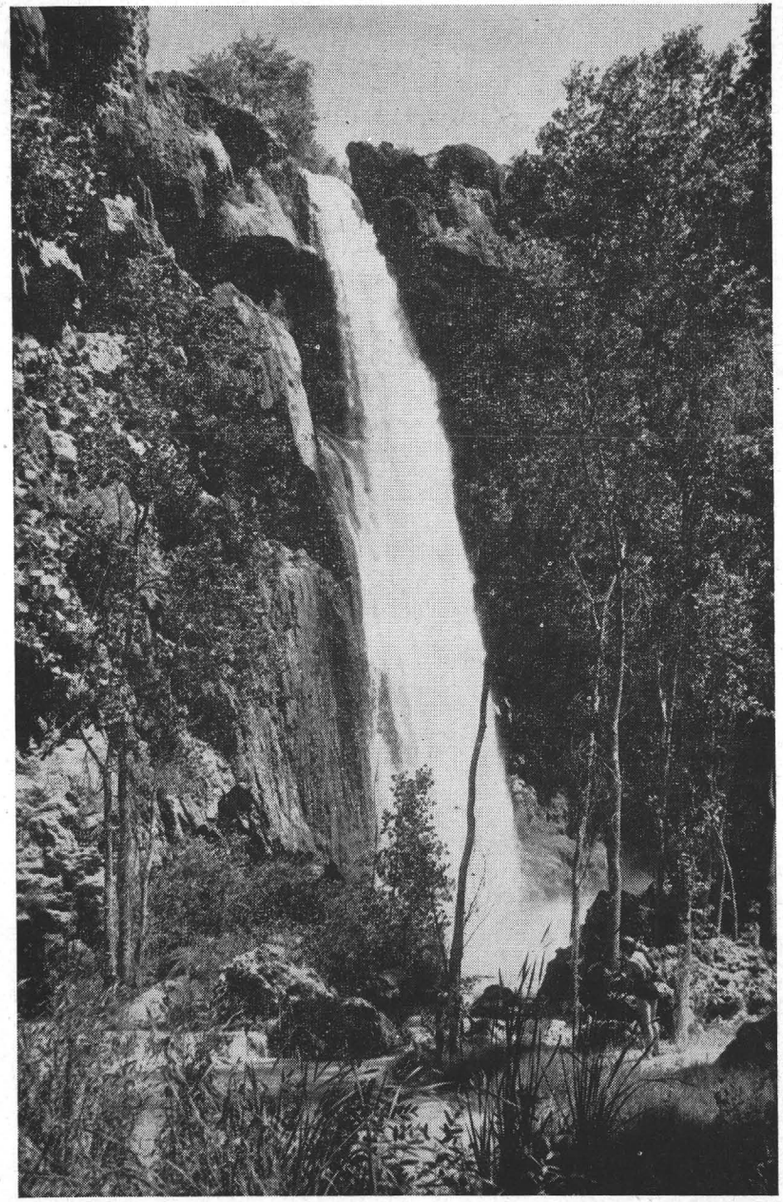
In compliance with Chapter 27, Laws of 1939, creating the Department of Mineral Resources, the following report of the activities of the department from July 1, 1947 to June 30, 1948 is hereby respectfully submitted.

We have so many requests for an explanation of the purposes and functions of the department that I am again this year starting the report with a review of the department and an outline of its duties.

Respectfully submitted,

CHAS. H. DUNNING
Director

Phoenix, Arizona
July 31, 1948



A predecessor of the modern change room, this water fall was handy to a nearby mine.

THE DEPARTMENT

Law and History

The Department of Mineral Resources was created by the fourteenth legislature in House Bill No. 103, Chapter 27, which became a law on March 1, 1939, and functioning started immediately thereafter.

The present appropriation is $33,125.00 per year, but it has been higher during some past years.

Purpose and Objectives

The Department was created for the purpose of furnishing aid in the promotion and development of the mineral resources of the state, with particular view to assisting small mine owners and operators along semi-technical and general economic lines. The Department cooperates with but does not encroach upon the field of the private engineer or the more technical bureaus.

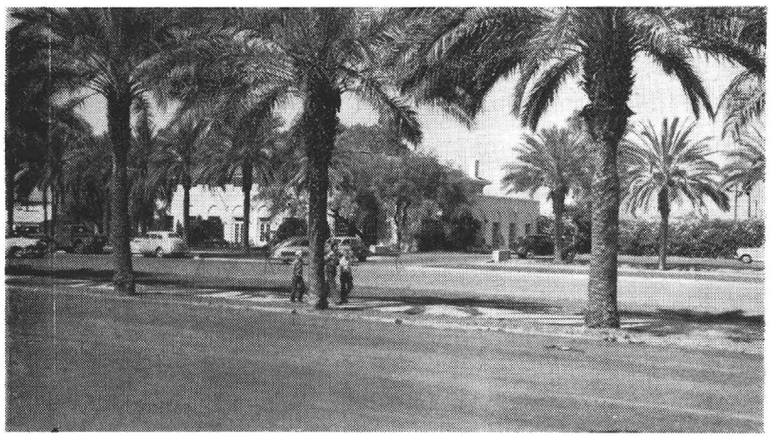
The following excerpts from the original law are explanatory:

> The Department of Mineral Resources shall "aid in the promotion and development of the mineral resources of the state. Conduct studies of the economic problems of prospectors and operators of small mines with view to assisting in their solution".
>
> "Assist in discovering sources of supply for persons desiring to buy minerals. List and describe available mining properties."
>
> "Cooperate with — State Land Department — Corporation Commission — Arizona Bureau of Mines — federal and other agencies."
>
> "Do such other things as may assist the more extensive exploration and development of the mineral resources of the state."

"The Board of Governors of the Department shall consist of five members, who shall be appointed by the Governor — Members of the Board shall receive no compensation as such but shall be reimbursed for necessary expenses — incurred in performance of their duties."

"The Director of the Department shall be appointed by the Board of Governors of the Department. The Director shall be a mining engineer graduated from an accredited school of mines, and qualified by education and experience to secure a certificate of registration as an engineer."

"The Director shall have charge and control of the work of the Department, including field offices, and shall appoint the field and office assistants and fix their compensation."



Offices of the Department, Mineral Bldg., Fairgrounds, Phoenix

FINANCIAL STATEMENT
DEPARTMENT OF MINERAL RESOURCES

STATEMENT OF EXPENSES
July 1, 1947 to June 30, 1948

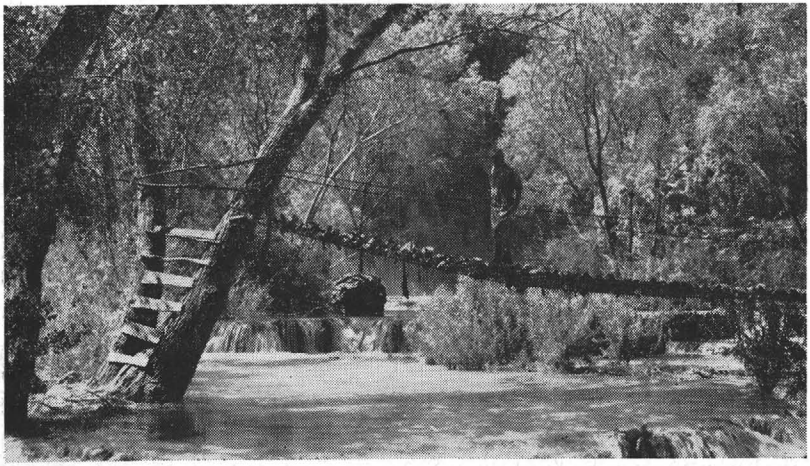
	Appropriation for fiscal Year	Expenditures for fiscal year	Balance Returned to State
PERSONAL SERVICES:	$25,200.00	$25,141.50	$ 58.50
CURRENT EXPENDITURES-TRAVEL			
State	4,500.00	4,254.55	245.45
Out-of-state	300.00	224.03	75.97
CURRENT EXPENDITURES-OTHER:			
Rent		600.00	
Postage		490.00	
Telephone and Telegraph		202.66	
Utilities		186.42	
Printing and Binding		402.86	
Equipment Maintenance		125.70	
Assaying		103.25	
Insurance		98.03	
Newspaper Clipping Service		62.84	
Office Supplies		272.77	
Films and Pictures		40.73	
Books		21.85	
Engineering Equipment		206.53	
Janitor Supp'ies		37.55	
Miscellaneous		139.61	
	3,000.00	2,990.80	9.20
SUBSCRIPTIONS & DUES:	25.00	5.67	19.33
CAPITAL OUTLAY:	100.00	77.90	22.10
TOTALS:	$33,125.00	$32,694.45	$430.55

Offices

The offices of the Department are maintained in the Mineral Building at the State Fairgrounds.

These offices are of a permanent nature and the Department has undertaken custodianship of the mineral exhibit. The exhibit is kept open during all business hours and is enjoyed by a great many visitors.

During the time of the State Fair the Fair Commission arranges directly with a special superintendent of the exhibit, and it has been the excellent custom at that time to also display private collections and competitive school exhibits of minerals.



Arizona mining is carried on under a wide varety of scenery and conditions, this scene is quite unusual.

ARIZONA'S METAL PRODUCTION

General

The tabulation on the opposite page shows Arizona's production of gold, silver, copper, lead and zinc for the past ten years.

In total value of combined non-ferrous minerals Arizona leads all the states. It is first in copper, third in silver and fifth in gold. Among western states it is third in lead and second in zinc.

During the calendar year of 1947 Arizona has produced $182,096,809 in gold, silver, copper, lead and zinc, and probably an additional $25,000,000 in less ordinary metals and non-metallics on which accurate statistics are not available. This constitutes an increase of about fifty percent (50%) over the previous year most of which is due to increase of pounds produced and not to increases in prices.

So far in 1948 (July 1st) production has been fairly well maintained, but the whole year of 1948 may possibly show a general five percent (5%) decrease. This is due to the fact that many small mines were forced to close following President Truman's veto of the Premium Price Plan in July 1947, and the fact that no similar measure was passed by Congress in 1948.

The loss of production from these small mines is greater than shows in the general statistical picture because the larger mines have generally been able to increase production because of more labor being available.

May it be added here that although it may be a fact that the production from small mines is only a small increment of our total production in any year, in these times of metal scarcity it it a very essential increment. Not only because the metal is greatly needed now, but also because if we are to maintain or increase our total metal production we must give more incentive or encouragement to the development of small mines. In them lies the necessary replacement of our present large mines - none of which will last forever.

In 1946 Mr. Busch, of the Department's staff, compiled a booklet entitled "Regulations Governing Mineral Locations in Arizona", which was published and distributed by the Department. The demand for this booklet was so much greater than anticipated that the supply was completely exhausted by May 1948. The Department had no place in its budget to meet the cost of a new edition of this booklet, and yet a heavy demand continued. We therefore sent out a solicitation to some of the active mining people and companies in the state and the response was most gratifying. Sufficient funds were received to cover the cost of printing a new and revised edition of the booklet - in fact it was necessary to return a portion of the larger donations.

From the same fund purchase was made of a Geiger Counter, an instrument that detects radioactivity. This instrument can be used both in the field and in the laboratory and can be so arranged to give quantitative determinations of uranium and thorium. Since procuring this instrument many miners and prospectors have brought samples to the office for determination and advice.

In Washington during the 80th Congress the usual array of mining bills was presented. These included various bills regarding the price or marketing of gold; contract termination settlements for the relief of mines which had prepared to produce vital minerals during the war under a government price assurance, only to have such assurance cancelled before the operation had returned its investment; metal stockpiling bills; waiver of required annual labor on mining locations; rejuvenation of RFC mining loans, and new premium price plan bills.

Of all these only the waiver of required annual labor for the mining year July 1, 1947 to July 1, 1948 received favorable action by Congress.

Of all of the bills introduced in Congress a new premium price to stimulate production from small and marginal mines was the most fought over - both for and against. In all probability favorable action by Congress could have been obtained for some incentive plan if the mining industry had been unified in its desires instead of being divided against itself. Some groups were insistent on legislation designed especially to help their partic-

	GOLD	SILVER	COPPER	LEAD	ZINC
	oz.	oz.	lbs.	lbs.	lbs.
1938	305,043	7,479,153	421,594,000	21,142,000	11,628,000
1939	316,453	7,824,004	524,224,000	21,542,000	13,422,000
1940	294,807	7,075,215	562,338,000	26,532,000	30,912,000
1941	315,392	7,498,260	652,634,000	31,276,000	32,986,000
1942	253,651	7,064,467	786,774,000	29,544,000	37,044,000
1943	171,810	5,713,889	806,362,000	27,454,000	39,354,000
1944	112,162	4,394,039	716,606,000	33,414,000	58,154,000
1945	77,223	3,558,216	574,406,000	45,734,000	80,452,000
1946	79,024	3,268,765	578,446,000	47,860,000	87,330,000
1947	95,860	4,569,084	732,436,000	57,132,000	109,288,000

Gold and Silver

There has been practically no resumption of straight gold and silver mining in Arizona, and very little in the United States. Production in Arizona occurred almost entirely as a by-product in the mining of other metals.

Arizona showed about a thirty percent (30%) increase in gold and silver production in 1947 as compared to 1946, but this was entirely due, and in direct proportion, to the increased production of copper, lead and zinc.

Foreign prices for gold remained considerably higher than set domestic price of $35.00 per ounce, and there was renewed feeling among gold miners in the United States that they were not getting a fair deal when they were prohibited from selling to anyone except the U. S. Mint. Various bills to alleviate this condition were introduced in congress but none received favorable action.

It is interesting to note that consumption of gold and silver in the arts and industries alone in the United States - not counting coinage - is considerably greater than our production. The balance comes from foreign hoards. If the hoards that have been accumulated throughout the ages were frozen for currency backing, and only newly mined gold and silver were available to supply the needs of industry, the law of supply and demand would soon force the price of each far beyond the present set prices. Such is the true value of these metals, and the real cost of producing enough to supply the demand.

Copper, Lead and Zinc

COPPER production in Arizona increased about twenty-five (25%) percent in 1947. The price remained steady at 21½ cents and, except for a continuing shortage of experienced miners in certain camps, there were no labor troubles or other factors restricting full production.

Present copper production in the United States is sufficient to cover only seventy-five (75%) per cent of our domestic demand, and as long as that condition prevails the removal or lowering of import tariffs is no doubt justified. Such a matter,

OFFICE MISCELLANY

Approximately the full time of two men, plus much of the time of the office secretary, is taken up by callers, telephone calls and routine correspondence. Although activity among the small mines has declined since the stimulating incentives of war time, and although our office is not so convenient to many persons as when it was located in the down town business district, the number of calls continually increases. These represent a wide variety and cover a broad field from advice to those who plan a prospecting trip, to examination of samples, to matters of public relations and economics.

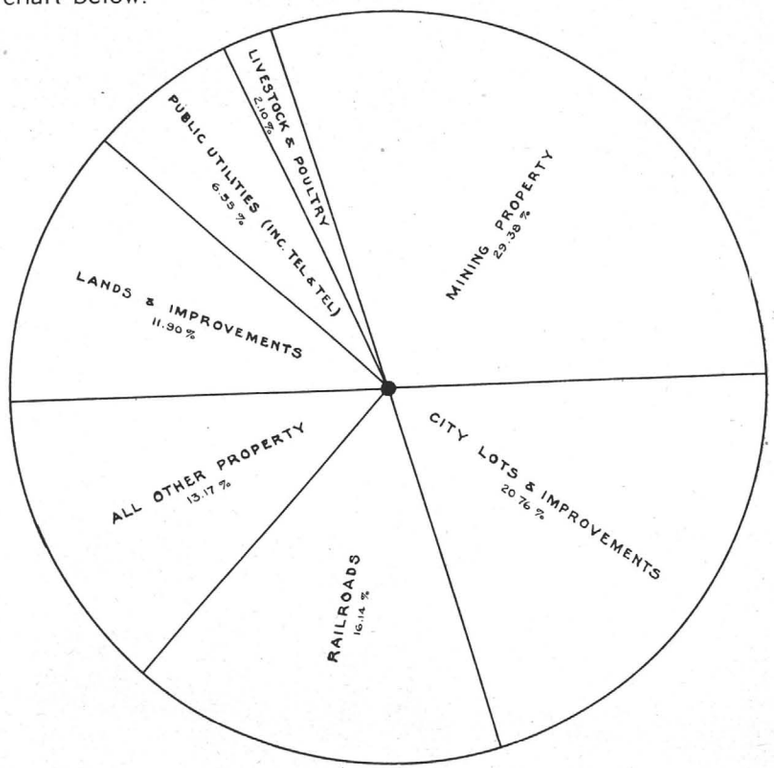
During the year the Department's Director attended the convention of the American Mining Congress in El Paso in November 1947, and the Colorado Mining Association in Denver in February 1948, where a paper was presented entitled "What We Need to Maintain or Increase our Mineral Production".

During the year talks were also given on various phases of mining economics to: The League of Women Voters, Phoenix; the Engineers' Club, Phoenix; the Chamber of Commerce, Kingman; and a class in natural resources at the Arizona State College at Tempe.

Also, during the winter and spring of 1948 the Department's Director undertook the writing of a weekly column on mining for the Arizona Times. This was continued for fourteen weeks but was suspended in the early summer of 1948 with the tentative plan of renewing the activity in some manner in the fall. The Kiplinger Magazine has accepted an article entitled "Our Metal Supply" for publication in its August 1948 issue.

Hearings during the year at which a representative of the Department was a witness consisted of several hearings on freight rate advances, a House Committee hearing on mining in Phoenix in September, and a hearing by Senator Malone's Committee on Natural Resources, in Denver at the time of the Colorado Mining Association meeting. Also a hearing by the House Committee on Public Lands in Phoenix in February before which our Mr. J. E. Busch appeared and presented oral and written testimony.

Mining is a competitive business, and unless Arizona is on a competitive basis with other mineralized areas, sooner or later we will have no mines to assume 29.38% of the total taxes of the state. Relative assessed valuations in Arizona are shown by the chart below.



Assessed valuation - State of Arizona 1947

All Mining Property	$168,093,603
Livestock and Poultry	12,032,557
City Lots and Improvements	118,797,469
All Other Property	75,338,686
Railroads	92,336,479
Public Utilities (Inc. Tel & Tel.)	37,468,145
Lands and Improvements	68,140,507

however, should be handled with great caution for sufficient stimulation to foreign production could easily lead to mechanization and greatly increased production from foreign mines, and a serious restraint against developing new mines here. We should not forget the days of 1932-33 when, due to the dumping of foreign metal on our markets, nearly every copper mine in Arizona was closed down and the economy of the entire state thrown into a chaotic condition.

What we really need is a plan that will lend incentive - at least by the removal of some restrictive influences - toward the development of new mines. Although the present demand may be extraordinary or exceptional, our basic economy has probably expanded to the point where we need more copper for average peacetime uses than we have needed heretofore. The way to get it is to find and develop new mines, for in that case we would not be dependent on foreign sources in times of emergency.

LEAD production increased about nineteen (19%) percent in 1947. Lead has been in shorter supply, generally speaking, than any other metal, and during the year the price was increased from 15 cents to 17½ cents. The Copper Queen Mine at Bisbee was the largest producer. Other large producers were the Mammoth-St Anthony at Tiger, the Eagle Picher south of Tucson, the Iron King at Humboldt, and the Trench-Flux at Patagonia. These five mines accounted for 86% of the state's production. Several new but smaller mines were stimulated by the advanced price and made developments that should show in future producton records.

Production of ZINC increased about 25% and came mostly from the above mentioned lead producers with the addition of the Republic Mine at Dragon, a copper and zinc producer. This is the twelfth consecutive year that Arizona has incresed its zinc production and it is now 15 times as great as it was in 1936. This increase has taken place in spite of the fact that Arizona has no zinc smelter, and ores and concentrates must be shipped to Utah, Texas or Oklahoma for smelting. The price remained at 12 cents throughout the year.

It is interesting to note that although Arizona produces almost 40% as much zinc as the Tri-State area of Oklahoma,

Kansas and Missouri, there are at least six zinc smelters in the Tri-State area and none in Arizona or nearby. Although the price of zinc at 12 cents per pound may seem quite high, it costs the small Arizona producer over $45.00 per ton to market his ore or concentrates, and he seldom realizes over 2½ cents per pound for the zinc content at the mine. It is hard to understand why the important factors in the zinc mining and smelting industry are still reluctant to build a zinc smelter in Arizona.

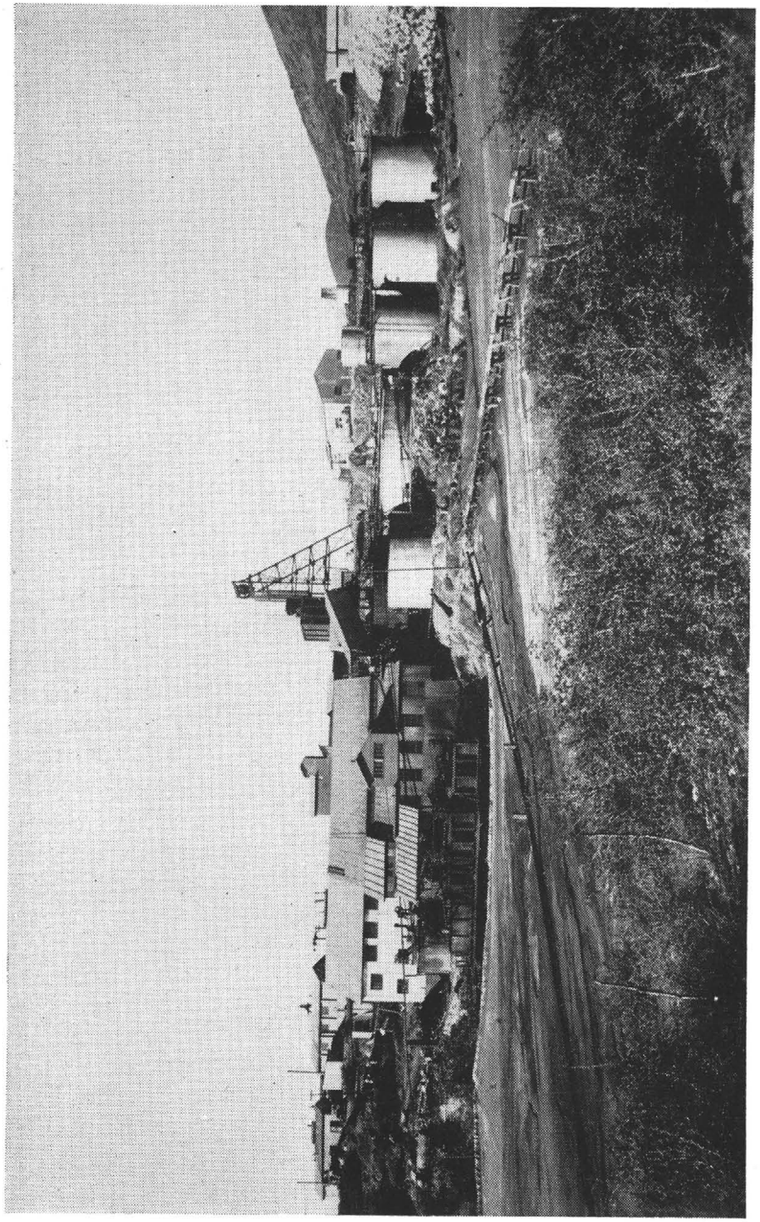
Miscellaneous Metallics

The mining in Arizona of such metal-minerals as MANGANESE, TUNGSTEN and MERCURY was almost negligible during 1947. In fact there was little production anywhere in the United States. As this Department has often stated, Arizona abounds in possibilities for the production of these metals, but some powers in Washington prefer to encourage supplies from foreign sources - at least until there is an emergency. The usual course then is to undergo an extreme shortage, to frantically and inefficiently try to get necessary production from our own dead mines, and to lose expensive equipment, valuable time and many young lives in trying to maintain supplies from abroad. All of this could be avoided if we did the few necessary things to maintain our own production in a healthy and going condition.

BISMUTH, a rather uncommon metallic element, used mostly in medicine as a corrective of some common ailments of the human digestive system, has been rather spectacularly produced in the state during the past year. High grade bismuth ore was discovred on the Anderson property about 12 miles northeast of Morristown. The Anderson brothers mined and sold one lot of approximately ten tons which averaged about 60% bismuth. The ore occurs in pods and lenses in a pegmatite.

Several exposures of the bismuth ore remain unmined, and preparations are being made to install a concentrator for the recovery of small sized and low grade material that cannot be sorted by hand.

Bismuth is currently worth about $2.00 per pound, and there was some little excitement in mining circles when the



This mine was sold for taxes a few years ago but is now one of the largest producers of lead and zinc in the state.

MINING TAXES

While there are many things that are restraining the development of new mines in Arizona, the greatest of these is probably the matter of overall taxes.

Mining does not face this difficulty alone for it pertains to all industry, and is an especial restraint against new business, even though new business is essential in creating new jobs.

The mining business however is effected more than the general run or average of business because the early stages of the development of a mine are highly speculative. Therefore when tax rules are such that an operator or developer must stand all of his losses but share any occasional profit, the result is to drive essential venture capital to other states or other nations.

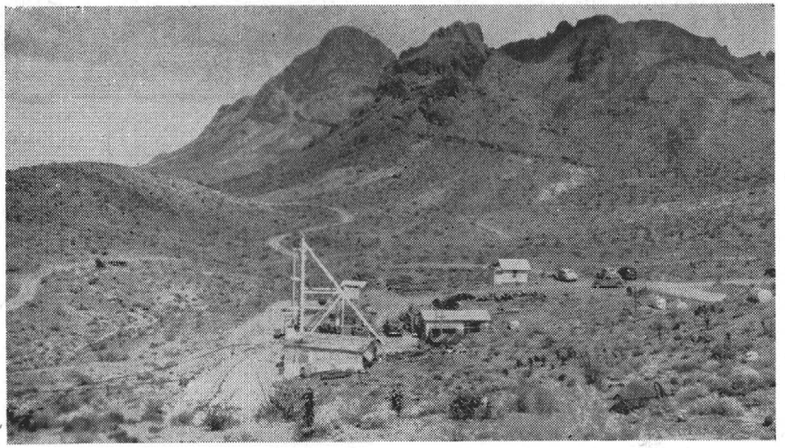
In addition to those general taxes, the mining industry in Arizona must pay a "producing mine" tax much greater than the same mine would have to pay in any neighboring state. These other states have mineral possibilities almost as attractive as we have, and the tendency naturally is for venture capital to seek the location where it gets the best break.

In addition to this producing mine tax and the regular improvement tax, the mining industry pays a 1% sales tax on its raw products. During the last year this tax alone has no doubt amounted to over $1,500,000. Agriculture pays no such tax but if it did the coffers of the state could seemingly be enriched by some $1,800,000 on their declared production of $180,000,000.

Some agriculturists and livestock men still take the attitude that the mines should be further taxed because some of them have the ability to pay. Let us not forget that those who have that ability to pay are the net result after wiping out and eliminating many others who also paid but failed.

Andersons loaded their truck with ten tons of high grade ore and hauled it themselves to a market in Chicago. (See picture Page 13).

In addition to the bismuth, promising showings of the LITHIUM minerals, spodumene and amblygonite, have been exposed on the same property, and this area east of Morristown and Wickenburg appears to have important possibilities for the development of commercially valuable deposits of the rarer metals.



Gold Mine — Oatman District

ARIZONA NON-METALLICS

Asbestos

The production of asbestos during the year has been carried on steadily, although on a smaller scale than in previous years. An extremely erratic market has been the greatest impediment against the operation of asbestos properties in Arizona, and has discouraged the development of new mines. As in the past, Globe has been the central point of operations for properties in the Sierra Ancha and the Salt River areas.

Probably the most consistent producers have been the Phillips property and the Regal Asbestos which have operated mines and mills steadily throughout the year. The Globe Asbestos mill has operated most of the time and at present is running ore from the dumps of the Johns-Manville mines. Operations are reported to be commencing at the Reynolds Creek Falls mine, and production may be added from this source. If the government stockpiling program ever gets under way, it should furnish the impetus for a considerable expansion of activity in the Arizona asbestos mines.

Barite

Operations of the Arizona Barite Company in their mine near Granite Reef Dam and in the mill near Mesa have continued steadily throughout the year. Flotation units added to the original mill installation have proven successful and have enabled the company to utilize the lower grade ores from the mine.

Approximately 100 tons of crude ore per day are now being processed into a product which is in great demand for oil well drilling. Successive increases in freight rates during the past year have added greatly to the difficulties of the company in competing with producers who are closer to the markets.

In addition to its mine near Granite Reef Dam, the company has recently acquired another property about 20 miles southwest of Aguila, and has already done much of the work necessary to put this new source into production. Development work to date indicates a strong possibility that this deposit will

fore issuing a stock selling permit. While such a plan would mean an additional load for the Department's staff, we would be willing to undertake it if the extra expense were available.

It should also be borne in mind that a good mining prospect or property is only one of several factors required to make a successful mining venture, and that this Department could hardly cover the other necessary factors. But the above plan should save mining-minded investors in Arizona many thousands of dollars and make it easier to finance good properties.

Another important field service which the Department is unable to carry on as completely as it should because of limited funds, is the making of thorough examinations of mining properties at times when they are open for such examinations. It often happens that someone will unwater and repair an old mine on the strength of some story. Perhaps all that was hoped for is not found; or the operator runs out of money. The work is abandoned and the mine again fills with water and falls into disrepair. Stories spring forth again and follow their usual process of growth. Sooner or later the cycle repeats itself.

If the Department could make a thorough examination at the time the property was accessible for examination, and place such data in a permanent file, much wasted effort might be saved, and more funds would be available for constructive ventures. It is also a fact that as economics and the demand for and value of various minerals change, such authentic records would be of special value.

A small open-pit copper mine in northeorn Arizona.

FIELD ACTIVITIES

During the year the attendance of Department engineers at meetings of the Arizona Small Mine Operators' Association throughout the state was on a curtailed basis, and the engineers had more time to examine mines and prospects for owners or operators.

The Department has always considered that one of its most important functions is to assist small mine owners in placing their properties, or in obtaining financial help. Or, conversely, in finding worthy mining prospects for those who have a desire for and the ability to develop them.

This is a most difficult field in which to accomplish anything tangible, because the venture capital that is required to develop mining prospects has been largely diverted to other fields, or has become reluctant to engage in mining because of the tax angle, the Security Exchange Commission requirements, and other restraining influences. Those who have the experience and the money become more and more insistent on having a "sure thing".

However several prospects have been placed in successful operation during the past year through the efforts of the Department, and we feel that future years will witness a continuation of properties so placed.

During the year there have been several mining "promotions" under way in Arizona and the Department is frequently called upon for its opinion regarding the various mining properties being promoted. It is most unfortunate that we invariably must claim ignorance because we do not have the facilities or the appropriation to make the type of examination such cases would require. Many persons are unable to understand why our engineers cannot merely make a brief inspection of a mine and tell whether it is "any good or not". As a matter of fact, examinations of this type require extra caution and often a large amount of detailed work, such as sampling and mapping. In many cases a hundred or more samples might be necessary, requiring a crew of men for several days and a considerable bill for assaying. Without such detailed work it is impossible for the Department to pass an opinion. Moreover, an examination of this sort belongs more properly to the field of private consulting engineers.

It has been suggested that the Arizona Corporation Commission require a confidential report from this Department be-

A Pumice Deposit near Williams, Arizona.

Site of Bismuth Discovery east of Wickenburg

prove large enough to justify the installation of another mill at that point. Present operations are producing approximately 50 tons of ore daily from an open pit.

The company produced about 15,000 tons of ground barite last year and expects to almost double that figure in 1948.

Cement

After considerable delay due to scarcity of equipment, construction of a cement plant at a location about 15 miles northwest of Tucson is now under way.

This plant is being built by the Arizona Portland Cement Co., an affiliate of the California Portland Cement Co., and the brand name will be Arizona Portland Cement. Most of the required raw materials will be obtained in the vicinity of the plant.

Production is anticipated within the next 12 months and will be at the rate of 2,000 barrels per day.

Feldspar

An extensive exploration program has been carried on during the past year in four different areas in Arizona by the Whitehall Mining Company, a subsidiary of the manufacturers of Bon-Ami cleansing products. Stripping of the overburden from large pegmatite intrusions uncovered several very promising feldspar deposits, and it is reported that the company is proceeding to patent numerous claims. Headquarters for the work were at Wickenburg, and exploration was carried on in the vicinity of Morristown, Kirkland and Kingman.

Future plans of the Whitehall Company have, of course, not been made public. While no immediate mining activity is expected, it may be reasonably hoped that the feldspar industry will eventually be of real importance to the economy of Arizona.

Fluorspar

There has been little activity in Arizona Fluorspar properties during the past year, and at present the only known production is coming from operations by the Campbell brothers in a mine about 12 miles northwest of Morristown. Although there is

that a similar set of conditions and, therefore, similar deposits will be found. It is a country where prospecting is difficult, but given enough incentive the prospector will find other deposits if they are there - just as he always has.

While the Atomic Energy Commission has gone a long way in the past year to lend incentive to the search for uranium deposits, it is quite likely that further incentives will be needed before production is sufficient. No one knows what production would be considered sufficient, but as long as such vital demand need exists, why limit the price of uranium to $4.00 per pound when it has an intrinsic worth greater than the price of gold ($510.00 per avd. lb.)? In any event, the production of uranium can well become an important part in the economy of Arizona.

Site of Uranium deposit, Hacks Canyon, Northwestern Arizona

URANIUM

Uranium has remained of prime interest and importance throughout the year. This is not only because it is the element from which atomic bombs are made, but also because of the enormous amount of heat or energy that may be available from it. It is said that the full release of the atomic energy in one pound of uranium is equivalent to the burning of 150,000,000 pounds of coal. The release of such full theoretical energy may never be possible, but scientists in all parts of the world are working on the problem, and continually advance the date when they expect the intrinsic energy of uranium to become of practical use.

Some two years ago the Department discovered that a certain copper mine in Hack's Canyon, northwestern Arizona, contained interesting amounts of uranium. For some time the policy of the government was one of restraint and mineral locations of uranium deposits were prohibited. Later, they permitted prospectors to mine uranium ore under a license, but set the price so low that there was no incentive to explore or develop prospects in remote areas such as Hack's Canyon.

During the last few months, however, the Atomic Energy Commission has seemingly reversed the previous hush-hush policy and has increased the price and added various bonuses, freight allowances, and even a cash prize of $10,000 for the discovery of certain types of deposits.

Thus the Hack's Canyon deposit became of renewed interest, and two examinations were made by the Departmnt in which we were equipped with a fluorescent lamp and a Geiger Counter. (See Page 26, Paragraph 2). Many interesting but puzzling facts were discovered during these examinations, and the mineralogy or manner of occurence of the uranium has not yet been fully determined. It appears to be an entirely new type of deposit - unlike any other known.

This deposit occurs in a sheared zone in Coconino Sandstone, a layer of the Grand Canyon Series, at its contact with the underlying Hermit Shale. As this contact is general throughout a large area of northwestern Arizona, it would seem reasonable

apparently a fairly good demand for both acid grade and metallurgical grade spar, the distance from the market and correspondingly high transportation costs make it difficult for Arizona producers to compete with mines which are located closer to the industrial consumers.

Gypsum

The increasing demand for gypsum, both for agricultural use and for plaster and fabricated products, has kept the Winkelman mine and the Phoenix processing plant busy during the past year. A crushing and screening plant has been installed at the mine and the crude product is partially processed before shipment to Phoenix. Mining is done with a power shovel in a large open pit and annual production is in the neighborhood of 50,000 tons. Plaster and fabricated p'aster products are produced at the Phoenix plant of the Union Plaster Co.

Mica

Production of mica during the past year came largely from mines and plants near Ajo and Buckeye. The Ajo deposit furnished muscovite mica, while that near Buckeye produced sericite. The final product from both mines was in the form of various grades of ground material. A small amount of muscovite was produced from workings in the pegmatite area east of Morristown.

Lately, the mica mine near Ajo has been shut down, and the mill is being dismantled and moved to Buckeye. Here a larger plant is under construction and a sizeable production of both muscovite and sericite is contemplated. The market for the ground product of both types has been very good throughout the year.

Marble

Few persons realize that near Dragoon in southwestern Arizona there is one of the finest deposits of marble in the world. An especially interesting feature of the deposit is that it varies at different points over its area, and contains such a variety of colors and designs that nearly all of the famous exclusive imported varieties can be matched.

The marble is being quarried by the Ligier Brothers of Dragoon who have had a lifetime of experience with marble. The blocks are shipped in crude form to finishing works at Carthage, Mo. and other points. The Ligiers hope to have their own finishing equipment in the near future.

Perlite

The perlite industry has continued active in the state in spite of the vicissitudes which always assail a new industry. Some producers have fallen by the wayside, but others have come in to take their places, and the net total production has been considerable. Practically all of the perlite produced in Arizona has come from the enormous deposits in the vicinity of Superior - railroad shipments from this point aggregating over 4,000 tons during the year.

The bulk of this production has been consumed by the local market which uses the expanded material in building construtions. Perlite plaster is gaining favor rapidly, due to its lightness and easy workability and perlite building blocks are being used in many new homes. Considerable crude perlite is being shipped out to eastern consumers, although the freight differential gives Colorado and Utah producers a distinct advantage over Arizona in eastern markets.

There is still controversy over different types of furnaces and methods of popping and no one method has yet been proven to be outstandingly superior to all others. All have their advantages and disadvantages, and there is a good field for research and experimental work along this line.

Pumice

True PUMICE is a volcanic flow rock in which steam or other gases have been entrapped under pressure in such a way that it created a spongelike porous rock.

A very fine deposit of such pumice has been discovered and partially developed a few miles south of Williams, Arizona.

The product is in great demand as a basic material for use in light weight insulating building blocks, and for such it is crushed and used as an aggregate with cement in the usual manner.

Current production from this deposit near Williams is about four or five cars per day, and the operators shipped over 500 cars during the first half of 1948.

The demand for this type of material is increasing, for if costs are comparable, it makes an exceptionally desirable material for building blocks as it performs the functions of making possible a very light weight block with normal strength and superior insulating qualities. So far no comparable deposit has been found in the state.

Silica Sand

The silica plant at Meteor Crater has been enlarged and moved from the mine to the railroad siding near Winslow. Certain objectionable features regarding dust and sizing have been corrected in the new plant, which is now in operation at the rate of about 25 tons per hour or four cars per day. The product goes to glass factories and foundries on the west coast and is one of the finest of such products obtainable.

General

The production of non metallics in Arizona is undergoing a healthy growth due largely to the growth of the Southwest. With a continuation of this growth and more equalized freight rates, non-metallic production could well become an important part of the state's economy.

One wonders how the prospector monumented his claims in this terrain