

MINING AND TOURISM IN ARIZONA

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Abstract: A review is presented of the observations made during a tour of Arizona with an emphasis on what is being done to preserve relics of the mining industry and of the facilities provided for visitors to see mining activities both past and present.

Each year more than 10 times as many people visit Arizona as actually live there permanently, some 35 million visitors. The state's attractions include the scenery, the Grand Canyon, desert landscapes, mountains and red-walled gorges, its cultural heritage, Indian, Spanish and the Old West, and its industrial tradition. It was mining that made Arizona and it continues to play a major part in its economy. The Directory of Active Mines published by the Arizona Department of Mineral Resources details 86 units, some employing over 4,000 persons.

But mines come and go and there are many ghost towns both from the past and in the making. As recently as 1982/83 many of the copper workings were being closed down and their company towns were obviously on the decline.

The metalliferous ores which formed, and still form, the greatest attraction for miners and historians to Arizona are those of silver, gold and copper. Gold was the prime attraction. It is found in lodes (primary deposits including veins) and in placers (secondary deposits). Most gold in the early days of Arizona was recovered from placers, which were readily worked, but soon declined in importance although some placer gold is still produced. The placer deposits have been formed from the weathering of primary gold orebodies such as quartz veins. For many years the mining of the quartz veins formed the backbone of this industry, but more recently much of the gold has been a by-product from copper-sulphide orebodies.

The copper of Arizona is of secondary origin; it is widely distributed in the oxide zone of many deposits in beds of sedimentary rock and in certain volcanic rocks called porphyries. These are masses of siliceous igneous rock, both extrusive lavas and intrusive at shallow depth, which have been permeated by metal-bearing solutions at some subsequent date. This has altered much of the rock to clay minerals with a scatter of the larger silicate minerals as phenocrysts - hence the name porphyry. Dispersed through the whole of such igneous rock masses are sulphides, notably of copper, which can be produced by bulk rock extraction and processing on a large scale. Arizona has been the chief area for working porphyry copper in North America. Fracture zones yielded higher concentrations of copper than most of the rock and were somewhat misleadingly called veins. Early copper mining was of the vein type along these but later mining involved the wholesale removal and processing of bulk rock to extract often less than 1% of copper and a range of other minerals, including gold.

Silver has also been an important mineral product although often as a secondary product alongside other minerals. Some deposits of native silver have been found and worked in placers and lodes but the history of mining development has been similar to that of gold.

All three metals have been obtained, in various proportions, at the mine sites referred to below but Tombstone was particularly notable for silver; Wickenburg and Oatman for gold, and Ajo, Bisbee, Globe and Jerome for copper. In 1887 the U.S. Geological Survey returns show that the mines of Arizona produced, in terms of value, 3.8 million dollars worth of silver, 830,000 dollars worth of gold and 17.7 million pounds of copper at about 40 dollars per ton. In rank, amongst all US. states, Arizona was fifth for silver, eighth for gold and third for copper. The principal companies all used "English coke" for smelting, but according to the Survey "lack of transportation facilities hampered the district"--- the cost of English Coke being 52 dollars per ton at Globe. This included 30 dollars freight charge from the nearest railroad to Globe, most of the operation being dependent on expensive animal haulage over rough tracks. The first copper smelting furnace at Jerome was fired with Welsh coke brought round Cape Horn by sailing ship.

The Vulture Mine at Wickenburg is a mining ghost town which is still dying despite a recent attempt at becoming a tourist attraction. The mine was opened in 1863 and by the 1880s over 5,000 people lived in the town. Operations continued to 1942 when the mine was closed by the Government as a non-priority operation but most of the diesel engines, shaft fittings and milling equipment still remain. Since the war some small attempts have been made to reopen and to break into tourism but none of this appears to have been successful.

The mine tour is a self-guided surface walk around the ruins of the mine and town. Special points are indicated on a map and on notices at each site. Nothing is specifically preserved however and decay is taking its normal course. The information centre/shop is reached after travelling nine miles up a dirt track but the operators do not see this as a reason for the dwindling number of visitors. They blame the depressed state of the area's economy, which is mainly based on copper. The population has now dwindled to three, all involved in the tourist feature, but it is not thought that this will continue for long. About 12,000 people paid 3 dollars admission during 1981 but the operators say that much of this went on insurance premiums and power supply.

Ajo is a company town and its Open Pit Copper Mine, the New Cornelia, has been a major producer for the Phelps Dodge Corporation and its predecessors since 1854. Until recently the mine and smelter employed over 1,100 persons but the day before the writer's visit 800 were laid off and the operation closed indefinitely, although partial reopening has occurred more recently. The pit can still be viewed by visitors from an official Inspection Point, a small pavilion on the rim edge giving a description of all operations. There is also a geological display, collection of old photos and a small museum of artifacts. The nearby mine office provides free literature and, in more prosperous times, tours could be arranged. The pit itself is 800 ft deep, covers 500 acres and had 60 miles of standard gauge rail track on its spiral bench system.

The company also supplies general information on the copper industry (some 23 open pits and 7 underground mines in Arizona once producing half U.S.A.'s output). The literature explains the importance of the industry and how efforts are being made to protect the environment.

South of Ajo is the Organ Pipe Cactus National Monument. It is over 500 square miles in area and extends to the Mexican border. The Monument is scheduled on account of its geological landscape and natural arid community, the large cactus being the dominant feature. There is a modern Visitor Centre with full facilities, theatres, audio-visual displays, dioramas, a 'cactus garden', historic artifacts collection, and literature. Illustrated talks, nature trails and scenic drives are also organised. There is also a camping ground.

At Tucson there are several important desert features including the Saguaro National Monument, the Sonora Desert Museum and the dry Colossal Cave. The Saguaro National Monument is a large park in two parts but each containing some of the state's richest stands of saguaro cactus, many of which are up to 50 ft high. There is a Visitor Centre but the nearby Sonora Desert Museum provides an excellent setting for studying the area in greater detail. The Museum is very modern and extensive and contains displays of the full range of desert life, flora and fauna, in natural settings, land reclamation displays, a demonstration garden and a cactus garden. There is also an Earth Sciences Museum (constructed realistically underground, part mock-cave and part mock-mine) with a fine geological and mineral exhibition. Colossal Cave is claimed to be the largest dry cave in the world but it does contain large stalactites, stalagmites and calcite columns from a much wetter past. The tour takes 45 minutes and covers 3/4 mile, 363 steps have to be climbed but the cave is electrically lit throughout. There is also a cafe and shop each employing one person full-time in addition to the three guides and part-time assistants. Each year the cave has about 50,000 visitors.

Bisbee, a town close to the Mexican border and surrounded by the Mule Mountains, was once a thriving mining town. It is now dependent on its mining history and mild climate for attracting tourists and holiday makers. Many of the old buildings and streets have been carefully preserved and the town has a well-supported Visitor Centre with literature on all types of active and non-active entertainments in the vicinity. Bisbee was once famous for its wealth of exotic minerals. It even has a rare copper mineral named after it (Bisbeeite - a hydrated copper silicate). A wide range of minerals can still be found in the locality and there are a number of fine mineral shops. There is also a fine collection in the town's Mining Museum. The Lavender Pit is a large open-pit with an Observation Point on the rim. The pit has spectacular rock colourings. Operations ceased here in 1975 but some leaching is still taking place commercially and bus tours of the pit are still operated using the two mine coaches. The Copper Queen Mine was opened in 1878 and closed in 1975. At its peak it employed 900 men but now there are only the tour guides. Visitors sit astride a plank on a trolley which is hauled by battery loco for about 1/3 mile underground. Four stops are made during the ride and features of interest are pointed out; the tour takes about one hour. Each party consists of about 20 persons, all being provided with protective gear and electric cap lamps. The open pit, mine and smelter still employ about 90 on maintenance and the leaching process. A further 10 are employed in the tourist facilities and the operations are visited by about 40,000 persons annually.

The ghost town of Tombstone is now almost totally dependent on tourists, mainly dreamers of the days of the old west. The main street has now really been spoiled; it is very much like a film set but with the addition of traffic control signs, a museum and Coca Cola

advertises. Behind the main street there are attempts at commercialisation, a 'preserved' railway and a mock-up of an underground mine in a large shed, for example.

From the main street steel and wooden mining structures can be seen on the skyline, mining being fairly active still, but on a small scale, in the area.

Globe is the main town of Copper Valley, an area extensively worked for copper from the 1860s to the present day. The largest unit in recent years, the Inspiration Consolidated, offers free mine tours of two hours duration covering both the open-pit and smelter. At the time of the visit the mine alone employed 1,600 (an additional 500 had been laid off two months previously) in an open pit 900 ft deep and using dump trucks for haulage. Visitors travel in their own cars in convoy following a guide to a look-out point where all the mine's features are indicated. Each car is given a large green triangular prism to place on the car's bonnet or roof for identification and all occupants wear safety helmets and goggles. Visitors are then guided through the mine area to the company's smelter and rod mill which they are shown around. Finally a return is made to the museum and gift shop. This sells rock specimens, copper products and books (including the Inspiration Mine Cook Book) amongst more usual items. Visitors are allowed to retain the goggles and a leaflet as a souvenir. The whole exercise, as well as being educational, is also good public relations but the number so employed is minute when compared to that employed in the company overall.

Posters locally advertise the Mining Country Crafts Fair, Copper Valley Music Festival, Copper Dust Stampede and Copper Country Square Dance and the whole atmosphere is permeated with mining lore and mining dust and fumes. Nearby is the Ray Mine where visitors pay the owners one dollar (1982 price) for the use of a shovel to dig 'Apache Tears'. These are rounded lumps of obsidian or natural glass found in the poor soils of the area.

North of Globe Highway 60 passes through the Apache Indian Reservation and through Salt River Canyon, the mini-Grand Canyon of Central Arizona. Here multi-coloured rocks, buttes, cliffs and canyon make up some spectacular views.

East of Holbrook is the Petrified Forest National Park which also contains the Painted Desert. The Park is nearly 100,000 acres in extent and is about 35 miles from South to North with a private road for 27 miles of this.

The southern entrance to the Forest Park has a Museum and Visitor Centre (called Rainbow Forest) with information desk, lunch room, souvenir shop and service station. Specimens of petrified wood (two types) can be purchased either polished or as found by weight. A half-mile trail leads to a large concentration of petrified wood logs. Along the Park Road are viewpoints overlooking logs up to 50 ft long (some still embedded at both ends) and remains of Indian dwellings. Further north the road enters the Painted Desert with spectacular views of coloured hills, brightly banded clays, badland formations and the Painted Desert itself. At the Painted Desert Visitor Centre there are full facilities including an information and orientation area, a 17 minute film showing how wood is petrified, display area and souvenir shop. There is also a "human history" display at the Painted Desert Inn. About 1 million visitors come to the Park annually and all cars are examined on leaving to ensure that specimens are not removed unlawfully. Specimens which have been mined outside the paid area can be bought at the Visitor Centre but this is clearly identified on them.

Between Winslow and Flagstaff there is Meteor Crater. This crater was discovered in 1871 and identified as due to a meteorite in 1905 by Dr. D. M. Barringer, whose family still control the area as a tourist attraction. The crater is 570 feet deep, more than 4,100 feet across, and 3 miles round the rim. There are the remains of a mineshaft and mining equipment in the crater. Dr. Barringer and others are said to have spent 25 years seeking the remains of the meteorite at depth but it is now believed that much of the meteorite was vaporised by the impact. At the Information Centre on the rim there are the usual facilities plus a display and film on the 'Space Age'. A good range of publications deal with the crater. A trail leaflet and a film is available together with a short 'lecture'. There is also a Museum of Astro-geology. The whole facility is well managed and popular with tourists despite its remoteness.

Oak Creek Canyon lies south of Flagstaff. It is one of the most attractive canyons in Arizona with brilliantly coloured rock pillars standing hundreds of feet high. Its centre, the small town of Sedona, is surrounded by great cliffs of sandstone predominantly red, brown and grey which provide a very spectacular backcloth. The whole area is now very popular as a recreation area and movie location. Visitors and timber provide its principal sources of income. The nearby town of Jerome is probably one of the most famous mining ghost towns in America. It is situated on a steep mountainside and can be seen from many miles away. The population fell from 15,000 in 1928 to about 100 in 1955. Mainly due to tourism and the town's popularity with artists this has increased to about 450. There seems to have been no loss of character however; the large hotels and hospital are still empty and there is a general untidy neglected look about all the side streets.

The main street contains a small artifact museum while just outside the town there is a much larger mining museum. Next to this there is a mine headframe, a modern exploration attempt to get even more mineral from the mountains around Jerome. There is no shortage of facilities and numerous features of interest all described minutely in the Tour-guides available in the town. There is no doubt that Jerome will continue to survive for many years, as it has all the elements needed for a commercialised ghost town except for an 'underground experience'. One of the most important features is that it is surrounded by other very varied attractions and has easy access. Two of these attractions are the Verde Indian Centre, an attractive and modern purpose-built Heritage Centre providing information and 'orientation' to the Yavapai-Apache Indian Culture, and Montezuma's Castle.

Montezuma's Castle is not really a castle but a 5 storey 20 room cliff dwelling built partly in a cave and dating from 1200 AD. There are other cave dwellings in the vicinity and around the sink-hole lake nearby known as Montezuma's Well. The Indians who lived here were salt miners but the mines have been destroyed by later mineral workings. There is a fully equipped visitor centre with a wide range of excavated objects on display and an excellent model showing what the site must have looked like in its heyday. A useful feature is a booklet specially prepared with a questionnaire for children.

North of Flagstaff is the Grand Canyon, one of the U.S.A.'s most visited sites. It is altogether an amazing feature in depth, width, variety of rock form and colour as well as climate and historic association. On the rim there can be a foot of snow but one mile below the temperature can be "in the 80s." There are many guide books on the area and the tourist is fully catered for in well equipped Visitor Centres, Museums, theatres for lectures and slide shows. Panorama boards, view points and signposted trails are also provided. There is a small airfield for tourist flights, white water trips down the rapids, trails by mule and on foot - over 75,000 people attempt the 7.5 mile trip (each way) from rim to river each year. Near to Maricopa Point there is the disused copper and uranium Orphan Mine, with headframes on the Canyon edge and aerial ropeway disappearing down the cliff-side. Elsewhere in the Canyon there are remains of many other mines and trials. Few of these are accessible to the ordinary tourist, but white scars and waste from asbestos mines on the lip of the Inner Gorge can be seen from overlooks about 10 miles east of the tourist village on the south rim. An abandoned railway station adds to the attraction of the area.

About 120 miles by road from the Grand Canyon is the Grand Canyon or Dinosaur Caves, near to the town of Kingman. The cave is entered by means of a 210 ft lift and the show sections consists of a 45 minute tour over 3/4 mile of paved footpath. The main features are the selenite crystals, helictites and cave-snow. A reception centre at the surface provides some information on the caves, the geology and location. The main operations are however a restaurant, curio and gift shops. The whole complex employs 20 full-time and a similar number of part-time staff in season. The name Dinosaur is misleading as the cave has no connection with dinosaurs either as fossils or former inhabitants.

In the mountains 20 miles west of Kingman is the small ghost town of Oatman. It is approached by the rapidly deteriorating Gold Road and through a completely abandoned town of that name. The sharp bends are fenced by steel mining ropes and many mine entrances and tips can be seen in a generally barren mountain landscape. Between 1906 and 1936 some 50 mines operated in the area and the population of Oatman reached 10,000. It is now 150 in summer, and in winter rises to 250, due to its mild climate. The local guide book claims quite modestly that most of the buildings are original and little has been done to destroy the atmosphere. Wild burros freely roam the street and there are 'shootouts' every Sunday. The town has been revitalised by renewed interest in mining (both historic and modern exploration) and tourism with frequent boosts to the economy when the movie-makers move in to use its authentic atmosphere and scenery. No information centre has yet been opened and 'antiques' and 'gifts' still seemed to take second place in the shops to more essential commodities. The town certainly had atmosphere and as yet seemed undiscovered except to the more dedicated tourist.

The Indian heritage of Arizona is now being exploited not only by the white man but by the Indian himself. Indian wares can be purchased in special shops and trading posts and there are many Indian Cultural Centres, some on the present reservations. There are 14 tribes in Arizona, speaking 4 languages, living in 20 reservations, some of which cover vast areas. The Navajo Indians, for example, number more than 150,000 and most live on the 16 million acre reservation. There are many important Indian monuments available for inspection ranging from cave dwellings like Montezuma's Castle and cave villages, through pueblo ruins to archaeological digs and sacred sites. Some of the finest natural features like Monument Valley and the Painted Desert are in Indian Country. It is now more than ever being appreciated that this heritage could be used through tourism to provide work and generally benefit the original Americans.

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SUGGESTED READING

Arizona Copper Mining and Inspiration Consolidated Copper Company. Inspiration-Consolidated Copper Company, P.O. Box 4444, Claypool, Arizona 85532 (4pp., free).

Arizona Ghost Towns. State of Arizona Office of Tourism. 112 North Central Avenue, Phoenix, Arizona 85004(4pp., free)

Beal, M.D. 1981 Grand Canyon- The story behind the scenery. KC Publications, P.O. Box 14883, Las Vegas, Nevada 89114 (64pp., \$3.75).

Bisbee. Published by Bisbee Council on the Arts and Humanities. P.O. Box 451, Bisbee, Arizona 85603 (4pp., free to callers).

Breed, W.J. and Roat, E. 1974 Geology of the Grand Canyon. Museum of Northern Arizona, P.O.Box 1389, Flagstaff, Arizona 86001. (185 pp.). (Revised edition due 1989).

Brewer, T.J. Jerome - A story of mines, men and money. SW Parks and Monuments Association, 339 S. Broad Street, Box 1562, Globe, Arizona 85551 (12pp., 25 cents).

Directory of Active Mines in Arizona. Arizona Department of Mineral Resources, State Office Building, 415 West Congress, Tucson, Arizona 85701 (21pp., free).

Galbraith, F.W. and Brennan, D.J. 1978 Minerals of Arizona. University of Arizona, Tucson, Arizona 85721. 1970. (116pp., \$1.00).

Globe-Miami, Arizona's Copper Cities. Globe Chamber of Commerce, P.O. Box 2539, Globe, Arizona 85501.

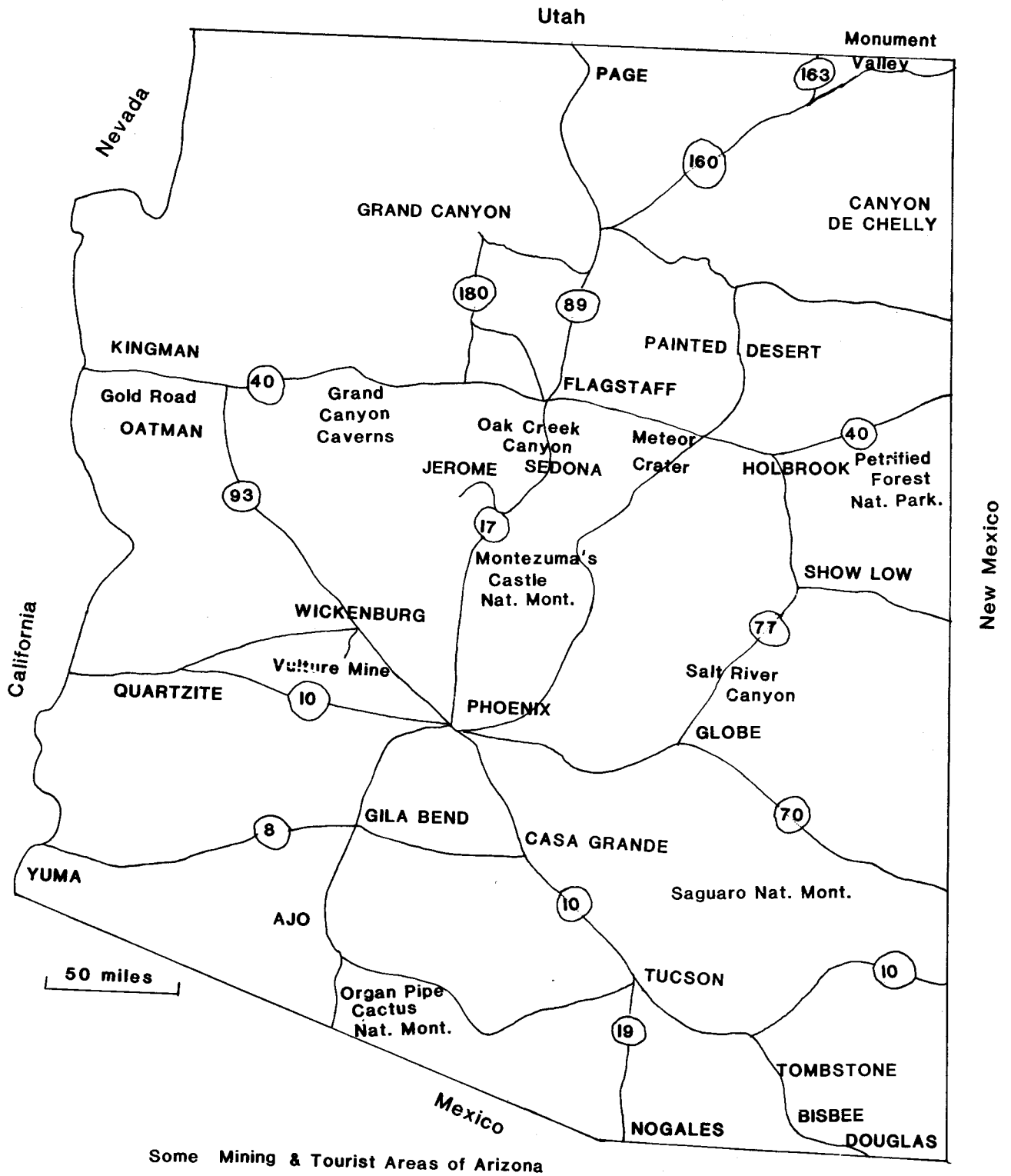
Jerome Tour-guide. Jerome Community Service Inc., KC Publications, P.O. Box 275, Jerome, Arizona 86331 (24pp, price \$1.)

Sherman, J.E. and B.H. c1960 Ghost Towns of Arizona. University of Oklahoma Press.

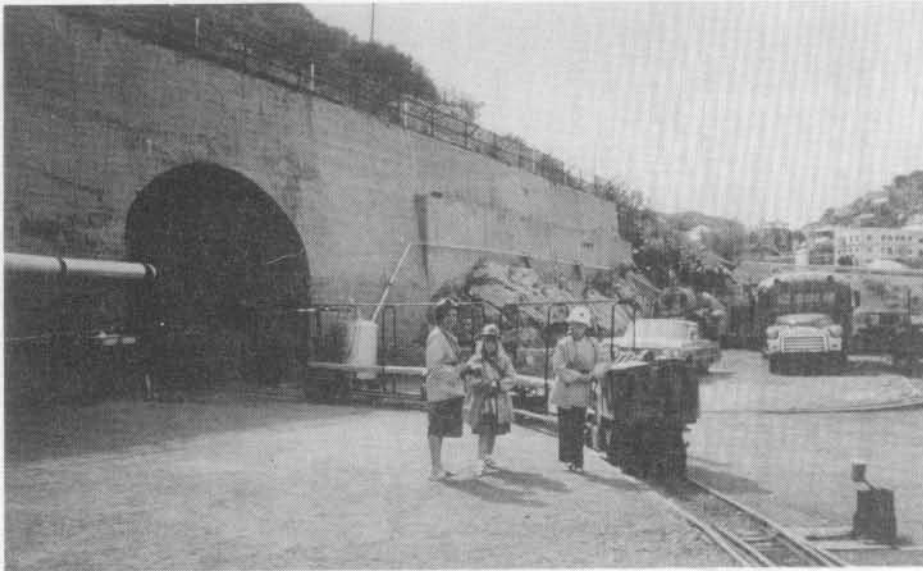
This is Copper Country. Arizona Mining Association, Suite 1222, Arizona Title Building, 111 West Monroe, Phoenix, Arizona 85003 (20pp., free to visitors)

Note 1: A free tour brochure giving times and dates of tours, list of safety rules for visitors and names of contacts is available from the Arizona Mining Association, Suite 1222, Arizona Title Building, 111 West Monroe, Phoenix, Arizona 85003.

Note 2: Costs of admissions and of publications may have increased from those quoted.



Some Mining & Tourist Areas of Arizona



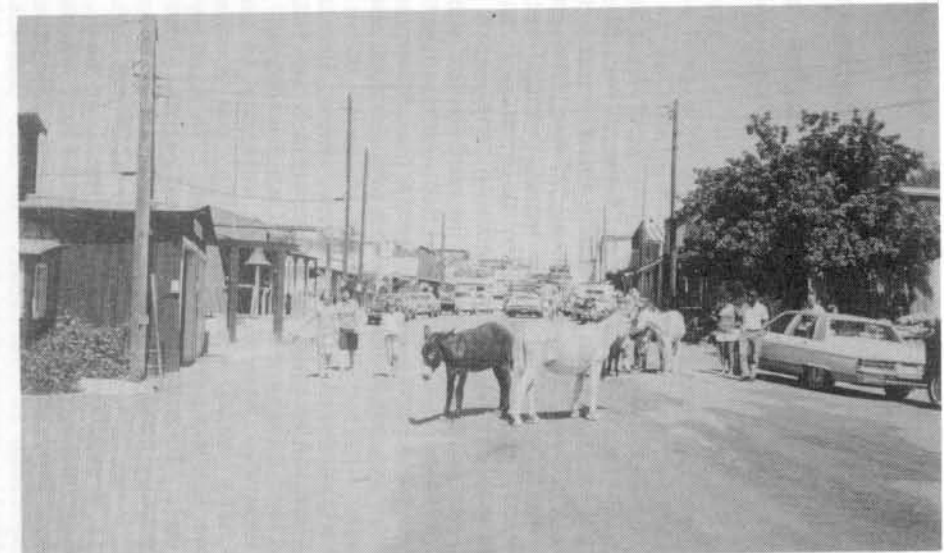
1. The Queen copper mine, Bisbee, 1982; underground tours are made using a train with sit-astride trolleys; surface tours of the Lavender open pit nearby use the old bus.



2. The well-fenced "car trail" at the working Globe Open Pit; old tyres mark each view point.



3. The Vulture Mine, Wickenburg, closed over 40 years ago; this structure formed a major exhibit at the Mining Museum in 1982.



4. Discarded prospectors' burros and their descendants almost outnumber residents at the ghost-town of Oatman in 1982.