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1956

San Manuel



San Manuel . . . History

The San Manuel Copper Corporation holdings are located in southeast Pinal County, Arizona, about 45 miles northeast of Tucson. The concentrator, smelter, administration building, and other plant facilities are located some seven miles southeast of the mine area at the new town of San Manuel.

The district was prospected prior to the Civil War, but there was little or no production until 1881. Until the advent of the San Manuel mine, the chief producers were the Mammoth and Mohawk mines, located a mile farther north. Gold, lead, zinc, and some vanadium and molybdenum were the main recoverable metals at these properties.

In the San Manuel group there are claims located in 1906 that have been held continuously to the present time, and at least two exploratory churn drill holes were drilled in or near the ore zone in 1917. The copper content indicated by these holes was not sufficient to encourage further exploration at that time.

In 1942, through the efforts of the owners, James M. Douglas, R. B. Giffin, Victor Erickson, and Henry W. Nichols, all of Superior, Arizona, the Reconstruction Finance Corporation and War Production Board authorized the United States Geological Survey to investigate the property. The Survey confirmed the owners' original conception of the probable existence of important copper mineralization, and by its recommendation the Bureau of Mines was authorized to put down a limited number of churn drill holes. This test drilling started in November, 1943, and was continued by the Bureau until February, 1945, when seventeen holes had been drilled for a total of 15,844 feet.

Magma Copper Company obtained an option from the owners in 1944 to buy the property. On September 17, 1944, Magma exercised its purchase option, and purchased additional adjoining claims held by the Apex Lead Vanadium Mining Corporation and the Quarelli family, and located additional claims. In December of that same year, Magma commenced exploration by churn drilling.

The San Manuel Copper Corporation was incorporated in August, 1945, and all of the property acquired by Magma Copper Company in the district was deeded to San Manuel.

Exploratory churn drilling was essentially completed in early 1948. A total of 205,536 feet of drilling was done to prove an ore reserve of 367,624,000 tons of sulphide ore, averaging 0.785% copper. There is an additional 111,876,000 tons of oxidized ore averaging 0.717% copper, or a total reserve of 479,500,000 tons averaging 0.769% copper.

Underground exploration and development was started in March, 1948, and has progressed continuously. Up to the present time there have been five shafts sunk and over 20 miles of drifting completed to prepare the first lift for production.

On July 10, 1952, Reconstruction Finance Corporation authorized a loan of \$94,000,000 to San Manuel for mine development and plant construction.

In the early part of 1953, Utah Construction Company and The Stearns-Roger Manufacturing Company (a Joint Venture) was awarded a contract for the design and construction of the entire surface plant, including the concentrator, smelter, railroads, and auxiliaries. Principal sub-contractors were San Xavier Rock and Sand Company, which furnished the concrete, Newbery Electric Corporation, which installed the electric control and transmission system and Custodis Construction Company, which erected the stack.

The concentrator was completed in September, 1955, and trial runs on stockpiled ore and mine development ore were started. By the end of 1955, Plant construction was completed except for minor cleanup work and smelting of copper concentrate was started January 8, 1956. January 23, 1956, the Mine was in production with the first stope undercut completed.

To provide adequate permanent housing facilities for the construction period, as well as the future productive life of the mine, an agreement was made with the Del E. Webb Construction Company and M. O. W. Homes, Inc., under which they were to finance and build a town suitable for the accommodation of San Manuel's employees.

Active construction was started in mid-1953, and by late 1954 the town of San Manuel was completed to its present status of 1,000 homes, shopping facilities, and hospital.

Magma Copper Company acquired the town early in 1955.

San Manuel Copper Corporation

Officers and Personnel

Board Of Directors

A. J. McNab, Chairman

Roy C. Bonebrake

R. H. Channing

Wesley P. Goss

George Murnane

Arthur Notman

Walter P. Schmid

Loan Administration

A. E. DeCelles Resident Engineer, Treasury Dept., Defense Lending Division
R. E. Hughes Resident Auditor, Treasury Dept., Defense Lending Division

Operating Staff, San Manuel, Arizona

President and General Manager,
Magma Copper Company and
San Manuel Copper Corporation Wesley P. Goss
Assistant to the President Frank Sarver
President, San Manuel
Arizona Railroad Company C. Leo Guynn
Assistant General Manager of Operations,
Magma Copper Company and
San Manuel Copper Corporation John F. Buchanan
General Manager,
San Manuel Copper Corporation Frank H. Buchella
Mine Superintendent Charles L. Pillar
Mill Superintendent Edmond V. Given
Smelter Superintendent Robert C. Wilson
Superintendent, San Manuel
Arizona Railroad Company Vincent I. Coxon
Mechanical Superintendent, San Manuel
Copper Corporation and San Manuel
Arizona Railroad Company Clyde A. Bilson
Electrical Superintendent,
San Manuel Copper Corporation R. P. Diehl
Chief Accountant John E. Durkee
Chief Internal Auditor Charles R. Anderson
Purchasing Agent James A. Gardner

Employment Agent Charles R. Perkins
Chief Surgeon, San Manuel
Copper Corporation Hospital G. P. Schnabel
Town Manager,
San Manuel Townsite Company Earl A. Schnurr
Assistant Mine Superintendent E. Keith Staley
Mine General Foreman H. I. Ashby
Mine Electrical Foreman William H. Cann
Plant Electrical Foreman Allen L. Lester
Mine Safety and Ventilation Engineer William W. Savage
Plant Safety Engineer Dudley M. Berry
Chief Mine Engineer Hubert J. Steele
Chief Geologist John D. Pelletier
Chief Mechanical Engineer James A. Kline
General Maintenance Foreman—Mine Vernon D. Staggs
General Maintenance Foreman—Plant J. E. Snodgrass
Head Transitman Richard G. Wilbins
Metallurgist Albert A. Wallach
Smelter General Foreman Luther Redmond
Chief Chemist Arthur B. Hall
Chief Design Engineer Frank G. Rose
Chief Engineer, Power Plant J. C. Sims
Supply Engineer Leslie C. Acton

Administration Building

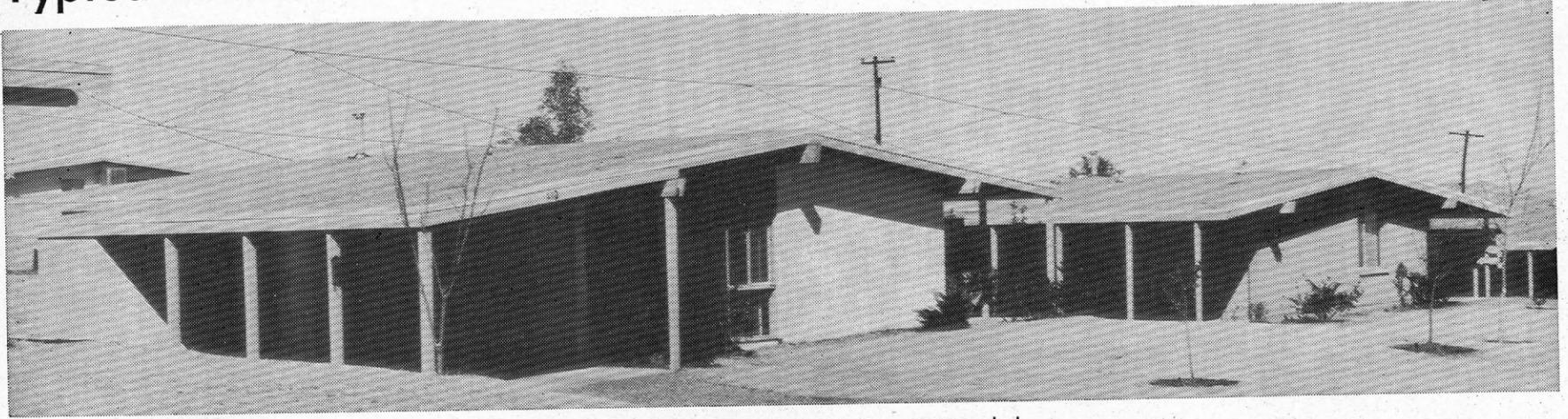


THE NERVE CENTER OF San Manuel Copper Corporation is located in the Administration Building. This building is the headquarters for manage-

ment, accounting, purchasing, and engineering departments and various supervisors.

San Manuel . . . The Townsite . . . Schools

Typical Homes



TYPICAL OF THE HOMES in San Manuel are the two bedroom, one bath units which are pictured above.

The Townsite of San Manuel, Arizona is a cluster of modern houses and shops, inter-laced with wide smooth boulevards and streets, on the sloping sides of the San Pedro Valley, and here is a residential community where no effort has been spared to make living as comfortable as possible.

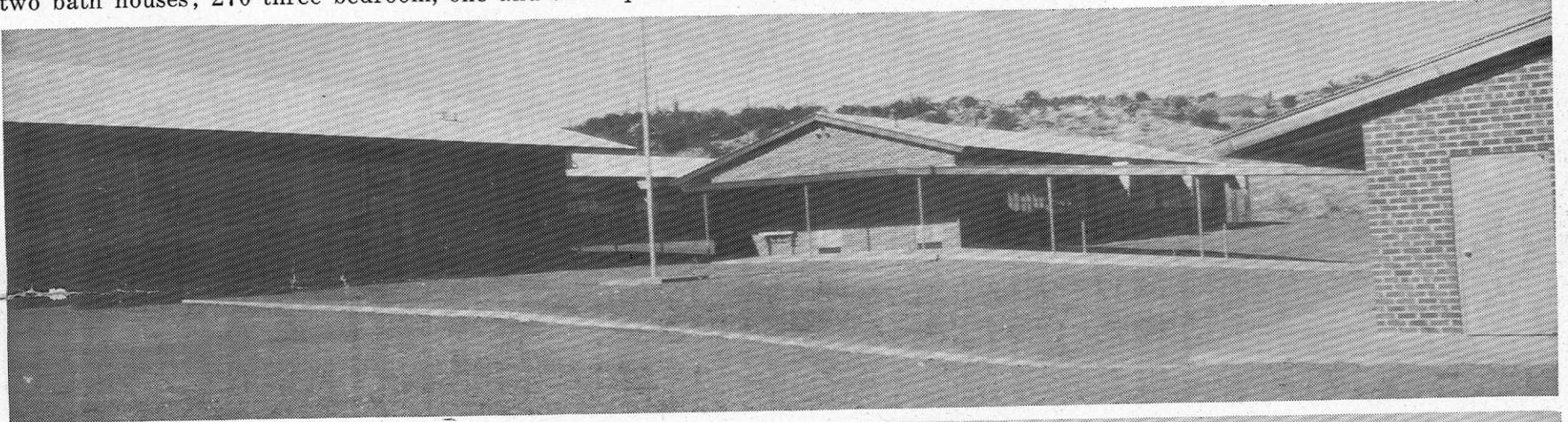
San Manuel was conceived and built for those who work for San Manuel Copper Corporation and for others in related activities. The latter includes merchants, doctors, police officers, clergymen and others.

The first residences were completed in December, 1953, and now there are a thousand houses in San Manuel. These are divided as follows: 15 duplexes, which make 30 one bedroom, one bath apartments; 30 four bedroom, one bath houses; 20 four bedroom, two bath houses; 270 three bedroom, one and three-quarter bath

houses; 400 three bedroom, one bath houses; and 250 two bedroom, one bath houses.

Work has just begun on clearing the ground for the main shopping center, which will supplement the present shopping center, including the latter's arcade. The main shopping center will eventually cover 32 landscaped acres off McNab Boulevard. The shops to be located here will offer San Manuel a wide variety of merchandise and services.

Original construction of San Manuel was handled by the Del E. Webb Construction Company, Phoenix, and then management of the townsite was under the direction of Webb and allied companies. Since April 1, 1955, the San Manuel Townsite Company, owned by Magma Copper Company, has managed the townsite properties.



SAN MANUEL ELEMENTARY SCHOOL, immediately above, consists of 12 classrooms and an administration building. It was constructed during the past year.



MAMMOTH ELEMENTARY SCHOOL, second picture above, located in Mammoth, 12 miles north of San Manuel, was constructed during the past year, also. It consists of 11 classrooms, a cafeteria and an administration building.

The Schools

Three schools serve the educational needs of the elementary and high school students of San Manuel, Mammoth and vicinity. San Manuel elementary school and Mammoth elementary school comprise Mammoth School District Number Eight and San Manuel High School serves Mammoth High School District, which includes students from San Manuel, Mammoth and vicinity.

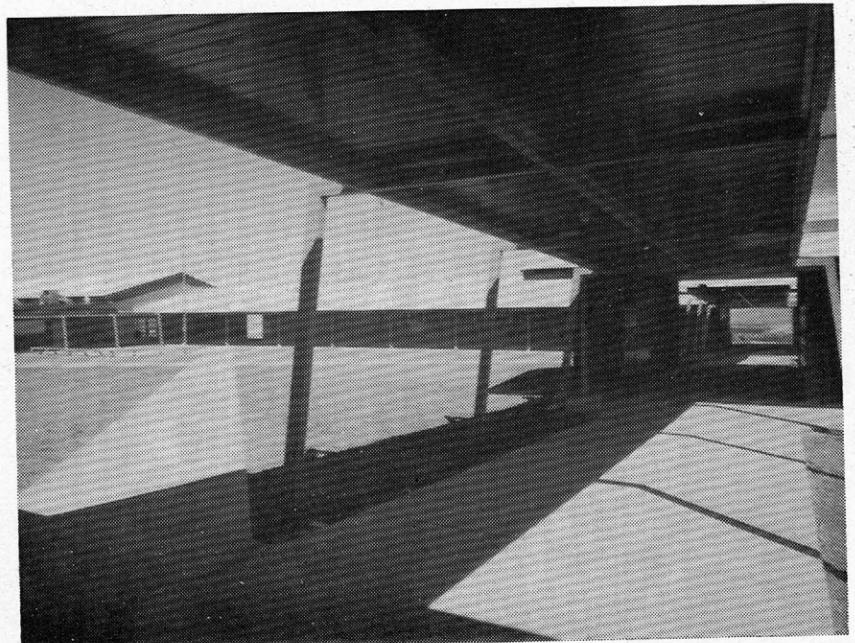
The three schools were all completed within the past year at a total cost of approximately \$870,784.90 for buildings and equipment.

San Manuel Copper Corporation donated two 15-acre plots for San Manuel elementary school, a 40-acre plot for San Manuel high school and a \$12,000.00 water system for Mammoth elementary school.

As of January, 1956, the schools had the following numbers of students attending classes: San Manuel high school, 227; San Manuel elementary school, 872; and Mammoth elementary school, 320.

The school board of the districts consists of James A. Gardner, San Manuel, chairman; Vincent Coxon, San Manuel and Charles H. Allen, Mammoth.

Roy Forsnas serves the districts as superintendent of schools. Robert Burian is high school principal. The high school has eight teachers, San Manuel elementary has 15 teachers and Mammoth elementary has 11 teachers. Other employees include janitors, bus drivers, truant officers and nurses.



SAN MANUEL'S NEW high school, seen above, which has just been completed, comprises six classrooms, one study hall, library, music room, cafeteria, homemaking room, science room, typing room, commercial room and administration building.

San Manuel . . . The Hospital

Outside View



SPECIAL FEATURES OF the Major Surgery Room, large photo, include a conductive floor and conductive equipment (everything is grounded to prevent the danger of static electricity), tiled walls, as seen in the picture (this is an important consideration for cleanliness and sanitation), and air conditioning which controls both temperature and humidity. Three other rooms, emergency, obstetrics and the nursery, have this type of air conditioning. In addition, the Major Surgery Room is equipped with battery powered lights which may be instantly flicked on in case of electrical failure.



THE LABORATORY, inset above, has facilities for conducting all the usual tests and laboratory procedures which are carried on in a general hospital.



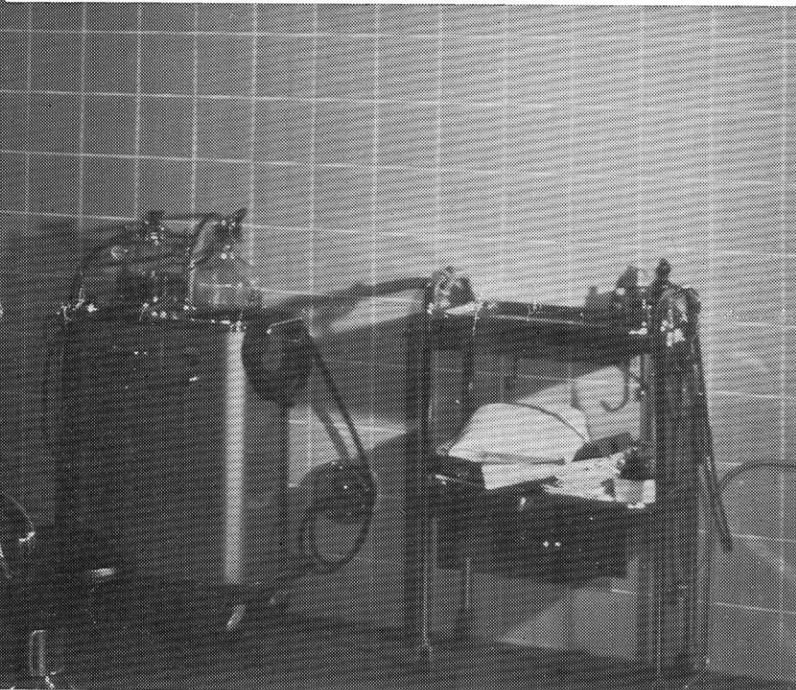
IN THE KITCHEN EMPHASIS is placed on the latest **AUTOMATIC** equipment with facilities present for the preparation of any type of food.

The San Manuel Copper Corporation Hospital, a half-million dollar institution which features not only the very latest equipment but the ultimate in construction features as well, serves the medical needs of San Manuel and vicinity.

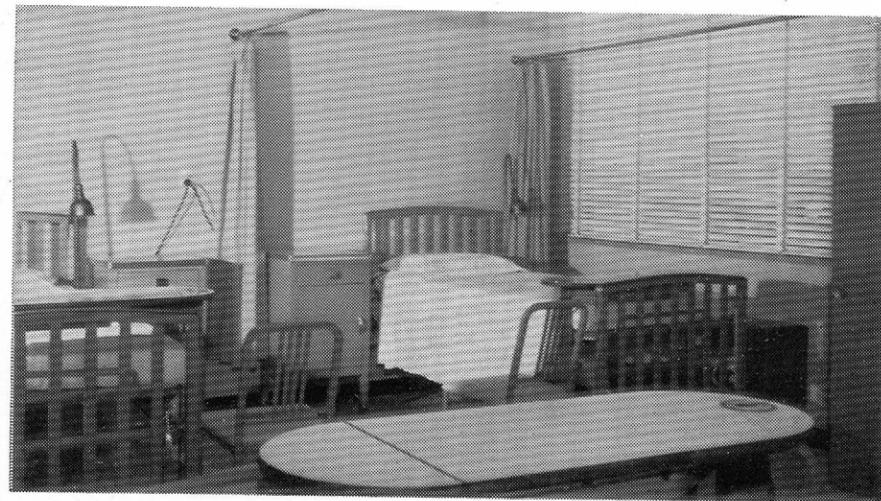
Doctor G. P. Schnabel is chief surgeon, Mrs. H. G. Bennett is supervisor of nurses and the staff includes four doctors, eight nurses and four aides.

The hospital includes a surgical wing, patients' wing and two smaller wings. The surgical wing includes a nursery, two obstetrical rooms, emergency room, x-ray room, x-ray developing room and reading room and a completely equipped operating room.

The patients' wing of 30 beds also has two isolation rooms. The two smaller wings include doctors' offices, laboratory, therapy



HALF OF A FOUR-BED ward is seen in this photo. The ward features, among other items, air-foam mattresses which can be completely removed for cleaning. This insures the utmost in sanitation.



room, reception room, waiting room, offices, kitchen facilities and the staff dining room.

The boiler room, which does such routine things as furnish hot water and air conditioning for the hospital, also contains a stand-by power plant in case of failure of the electrical system and a stand-by oil-burner system to "take over" in case of the failure of the natural gas supply.

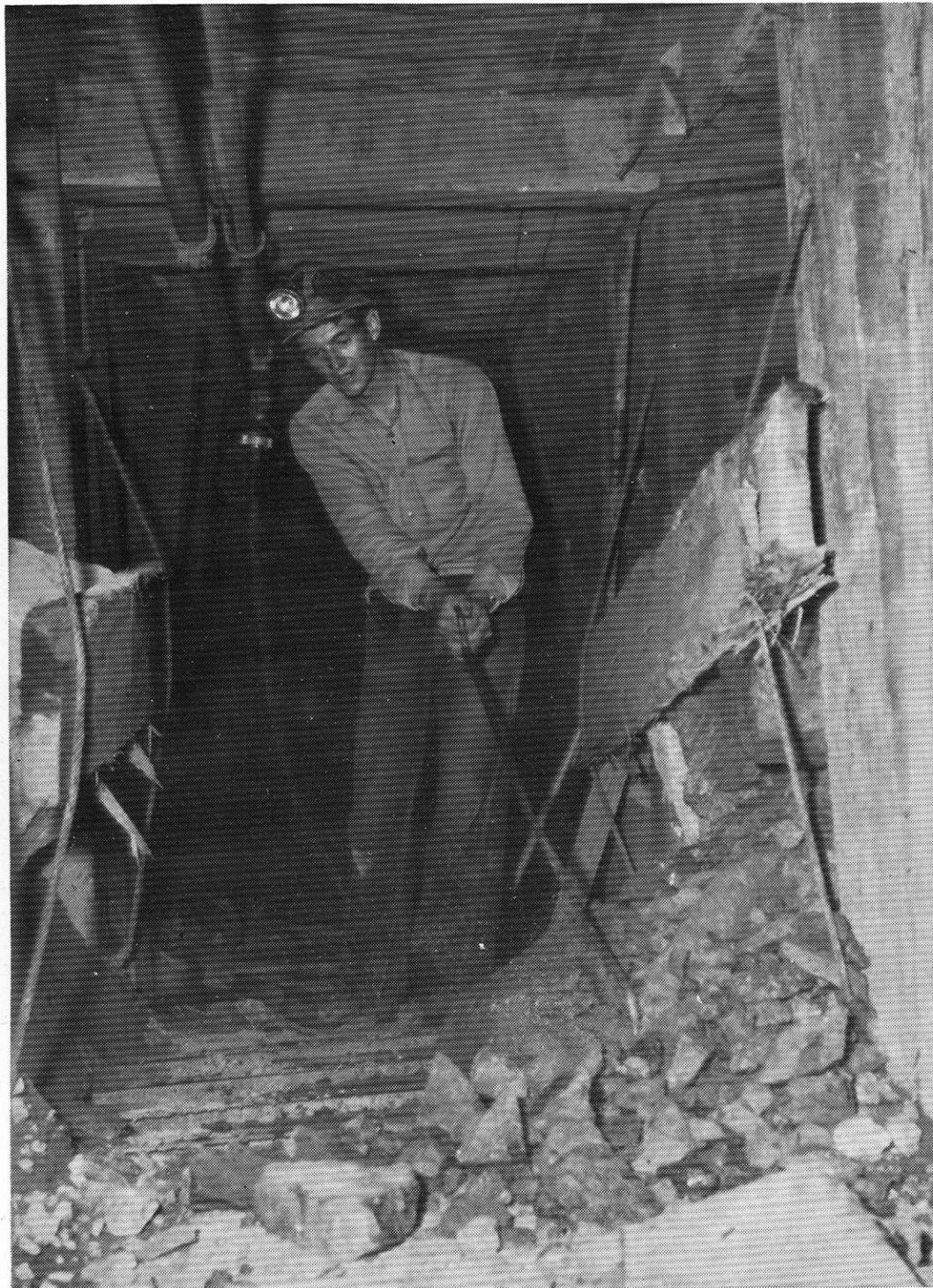
The hospital is a member of the Southwest Regional Blood Bank of the Red Cross. This is a blood bank system which maintains stocks of blood of all types at all times and blood is available on call. In addition, the hospital maintains a list of blood donors in the townsite, by type, who may be called in emergencies.

Just south of the hospital stands the nurses' home. Facilities exist for accommodating seven nurses in furnished, modern, completely air conditioned quarters.

San Manuel . . . The Mine



UNDERCUT, showing caved ground in the background, and undercut crew drilling the back and pillar preparatory to the next undercut blast.



SAN MANUEL OREBODY AND METHOD OF MINING

The San Manuel orebody is part of a mass of mineralized rock, chiefly a granitic appearing monzonite and a similar, though finer textured, monzonite porphyry. This large zone of mineralization is covered for the most part by conglomerate, a younger rock than those comprising the mineralized zone and containing no copper. The ore body, or portion of the general mineralized mass containing appreciable copper sulphide minerals in addition to iron sulphides, covers an area over one mile long by one-half mile wide. The known depth of ore extends about 2,600 feet below the surface. The control as to size and shape of the orebody is an arbitrary cutoff based on copper content of the mineralized rock. Therefore, that portion considered economically feasible to mine appears in the more northerly portion as a tabular mass up to 400 feet thick with its long dimension bearing northeast and lying at an angle of 55° from horizontal to the southeast. This attitude persists down dip for about 2,400 feet where it flattens and then rolls upward to form a cross-sectional fishhook shape. Within this part of the orebody there is a pronounced thickening, and it is the upper one-third of this southeast portion, starting some 1,100 feet below the surface, that was selected for initial mining operations. Of this 1,100-foot thickness from the first mining level to the surface, there is an average of about 430 feet of ore and 670 feet of waste overburden.

The thickness of the overburden and shape and size of the orebody combine to make open pit mining impractical. For these reasons the underground block caving method of mining was selected. The monzonite in which the ore occurs is well fractured, caves readily and crushes to a size that is easy to transport.

The area to be mined has been divided into panels 210 feet wide, separated by 35-foot pillars. The blocks or stopes within each panel vary in length from 175 feet to 270 feet.

Block caving entails the undercutting or removal of a horizontal slice of ore of sufficient

See following page

GRIZZLY DRIFT showing draw raises on either side and broken ore from the undercut being run through the grizzly into a transfer raise.