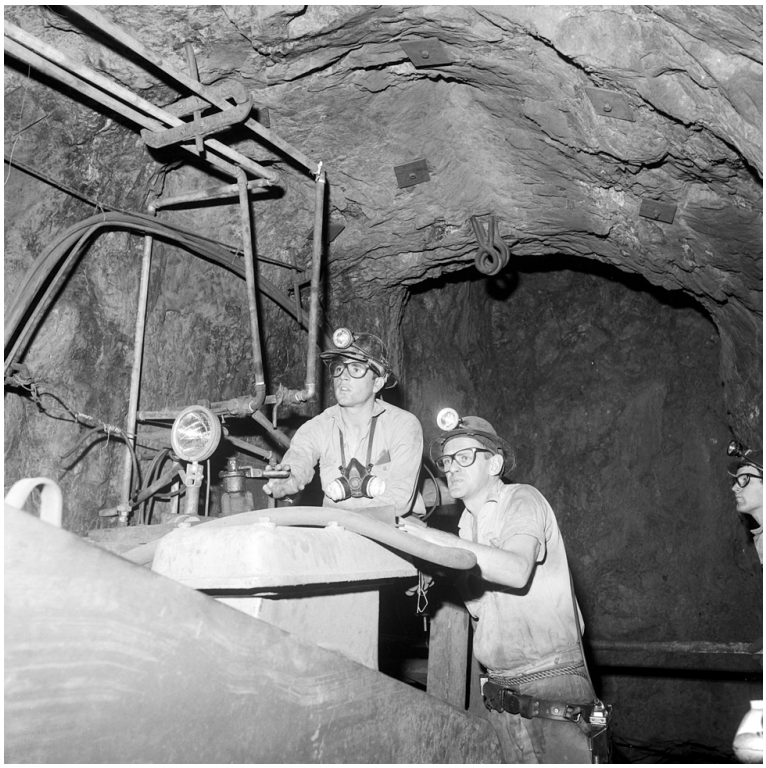
GOING DEEPER FOR COPPER

AS K57 COMPLEX COMES TO LIFE, MINING GOES DOWN BELOW 15 LEVEL

On a signal from brakeman Steve Delaney, Les Rudd eased forward the 20-ton diesel loco and its rake of 12 Granby cars to line up yet another car with the chute in the roof of the 15 Level drive.

Above the chute, slusher operator Hans Band waited for the signal to indicate the Granby was immediately below the chute and then opened the air valve which clutched in the slusher haul drum. In front of him in the scram, the 72-in. scoop was dragged forward and sent five tons of copper ore tumbling down the chute into the waiting Granby. A second bite of the scoop and then the whole cycle was repeated.



Shift Boss Egon Beuhler checks operations in15 Level scram with Slusher Operator Hansa Band.



To men like Steve Delaney, Les Rudd and Hans Band, the work methods were pretty much routine — the sort of jobs which scores of other men were doing in other parts of the mine. In two important aspects, however, their contribution to mine output was unique. The ore which they were handling was part of the first production from the 1100 Orebody and represented a new phase in the development of Mount Isa Mines Limited. Secondly, the ore was the first to be crushed and hoisted through the K 57 Shaft and associated installations.

In the R29 Stope cutoff drill holeis is prepared for firing by Ringfirer Charlie Dunne.



Production from the 1100 Orebody, only just beginning and in a comparatively small way, had followed many years of patient exploration and development work, the full rewards for which are not expected to be reached for two more years.

Working with modified Simba ring from 14 Level, Driller Jim Ammiott drills down into R29.

For the first 31 years of its life, Mount Isa had never heard of the 1100 Orebody. It was there all right, an underground "mountain" of dullish grey rock flecked with yellow chalcopyrites. Like other orebodies revealed by exploration, however, its discovery was to await the probing of the diamond drill.

The story of the 1100 Orebody and neighbouring orebodies goes back around 1700 million years. As Chief Mine Geologist Bob Hewett explains, the sediments in which the copper occurs were at that time in the process of being deposited on an ancient sea floor. It is thought that if the copper was not actually deposited with the sediments, it was introduced very soon after the beds were laid down and before they had been compacted to form rock.



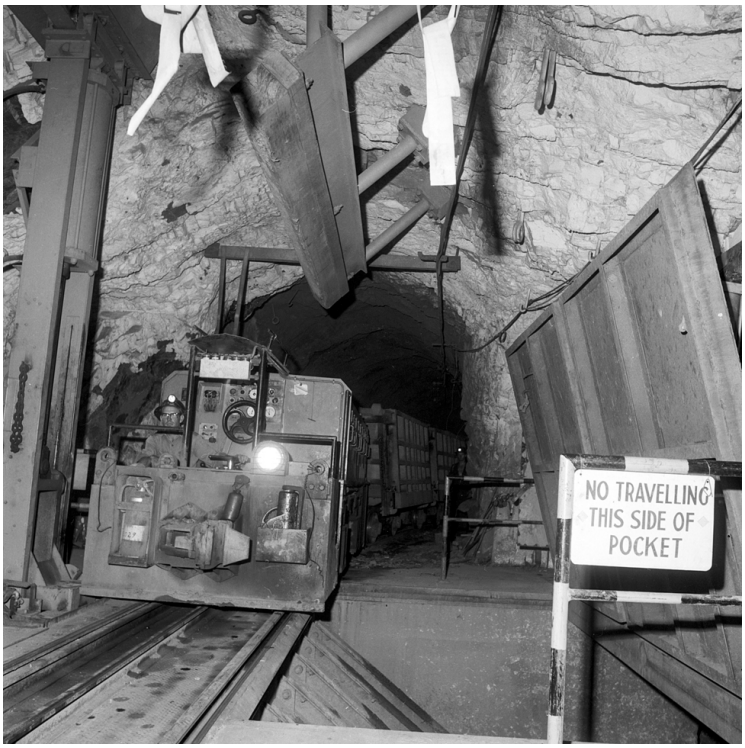
"During geological time, earth movements raised the sediments to above sea level and contorted them into the situation in which we find them today. A combination of increased temperatures and pressures associated with these movements of the earth's crust have

As holes are charged with ANFO, Watty Ervine maintains telephone communication with the face.

caused movement of the copper and also its concentration in certain areas," says Mr Hewett.

During a drilling programme penetrating below the old Rio Grande lead workings which began in 1952 and lasted until 1954, the company's geologists noticed an increase in copper content in depth in the Rio Grande silica dolomite orebody in the area of 9 Level. Remote from existing mine workings, the target area was not readily accessible for

investigation. Deep surface drill holes were proposed to test downward extension of the silica dolomite mass. This programme, started in March 1955, met with immediate success when a large high-grade intersection was obtained in the first hole.



Extension of underground drives southwards from the main shaft pillar on 11 Level permitted a new programme of underground exploration which confirmed and extended knowledge of the outline of the orebody.

Hauling a rake of 12 Granby cars, a powerful new diesel loco (with driver Leas Rdd at the controls approaches the ore pocket on 15 Level.

Continuing exploration has revealed that the width of the "1100" ranges up to 600 feet from footwall to hanging wall and it has depth of 600 to 800 feet. Exploration at both ends of the orebody is continuing but the strike limits have not yet been reached.

Haukling a rake of Granby cars, a powerful

Long before today's comparatively precise knowledge of the orebody had been established, however, early diamond drilling had revealed extensive economic mineralization and this was a factor in the planning of MIM's $130 million expansion programme. Much of the mineralization was below what were then the working levels and beyond the reach of the older ore haulage shafts. The answer was in K57 Shaft and its associated crushing stations, a project which has provided convincing evidence of the high capital cost of present-day, large-scale mining operations.

While K 57 was designed to service all MIM's deeper workings, and was not limited to one specific area, the "1100" required other major developmental work of its own. Located as it is, to the south of the main shaft pillar, new drives had to be blasted out of the rock, ventilation to be provided and a system of ore passes driven through to the crushing and haulage stations.

Ground conditions in the orebody are reminiscent of the hard 650 copper orebody at the north end of the mine where sublevel open stoping has been used successfully and has become a familiar practice.

There are, nonetheless, differences in the techniques used in the "650" and those which are being either planned or have already been introduced for the "1100". "The main difference," says Mine Planning Superintendent Mai Rose, "is that we shall be mining the '1100' without using sublevels —all blast hole drilling will be from the main levels. Improved drilling machines and techniques will enable the drilling of bigger and deeper holes than we used in previous sublevel open stoping.

"Once we get on to the main production drilling, upholes will be drilled to 80 feet and downholes to 130 feet, using Gardner Denver drills mounted on modified Simba rigs. Firing a ring pattern, we shall be breaking over 60,000 tons of rock with each blast of over ten and a half tons of explosive."

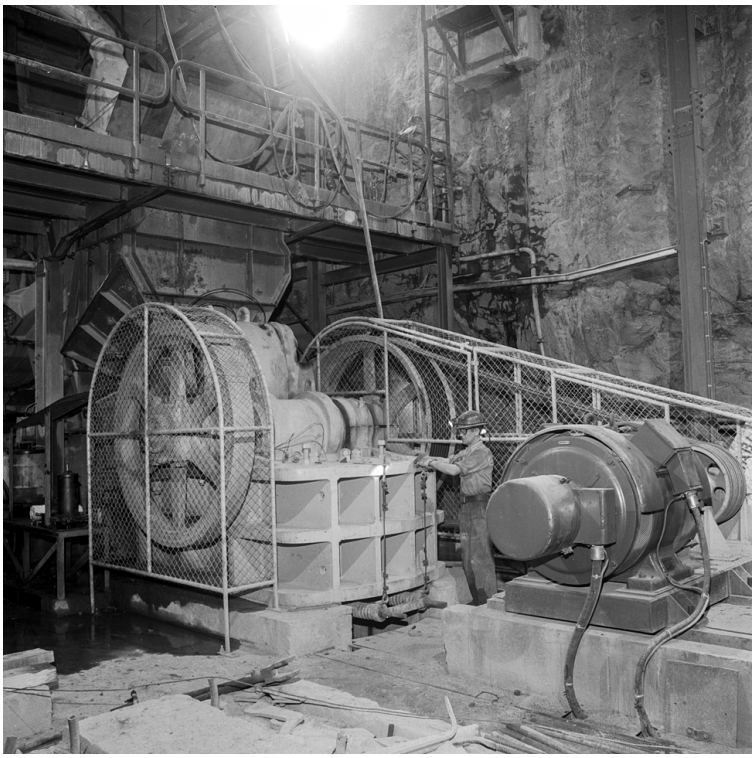


Full-scale production, however, will not be possible until considerable further planned development work has been completed. This includes the opening up of additional scram drives, construction of new tipples and ore passes and the installation of additional crushing equipment in the K57 installation.

As Granby cars are tipped by hydraulic ramp, ore falls nearly 1000 feet to new crusher.

In the meantime, the early production resulted from mining of the cutoff in the first stope —known as R29 —of a number which are either in an advanced stage of planning or are already under development.

For the layman, it is difficult to imagine the vastness of the underground caverns which will remain for filling when each stope is worked out. If, ultimately, a decision is made to remove the floor pillar between the stope currently under development and a similar stope at 17 Level, the maximum dimensions of the hole in the ground could be about 700 feet from roof to floor, 400 feet long and 130 feet wide. This would, for example, be almost large enough to hold a 70- storey building with twice the floor area of the MIM general office block; or deep enough to take the famous striped stack with 200 feet to spare.



"We're still a long way from completing even our first stope though," said Mr Rose. "The cut-off is, in effect, one big slice right through one edge of it. This alone measures about 370 feet long by 350 feet high and is 30 feet wide."

Nearly 3500 feet underground, Operator Gordon Ward makes an adjustmeny to the first of the new secondary crushers which form part of the K57 complex.

Work in the cut-off provided a "dress rehearsal" for full-scale operations, testing men, equipment and methods. It provided, too, a valuable running-in period for the K 57 complex.

Using Gardner Denver drills on conventional bar mountings, two and a-quarter inch holes were drilled to take the explosives. Firing broke about 7000 tons of ore which fell away into the scrams below.



At the time the cut-off was being worked in the R 29 stope, only three of five scrams were operational. Others were under development, each with 12 controls the openings through which the ore gravitates from the stope above.

Temporary crushing arrangements invovled Ron Mitchell in some handbreaking of oversize rocks.

Completion of the present phase of crushing development will include one primary and two secondary crushers, but at the time Les Rudd's Granby cars were being discharged through tipping by pneumatic ramp, only one of the secondaries was operational. Temporary substitution for primary crushing was being provided by one man —Ron Mitchell —working with a sledge hammer to break oversize rock on the 15 Level, 20-inch grizzly.



17 Level chain control is inspected by Shift Boss Len Forster.

With modern mining techniques, hand work is comparatively rare and Ron, who was able to joke about his role as the "primary crusher", admitted that even this temporary job was not restricted to the hammer.

"Occasionally we get very large pieces of rock separated out by the grizzly. These I allow to build up for a while and then I drill them and break them with explosives," he said.

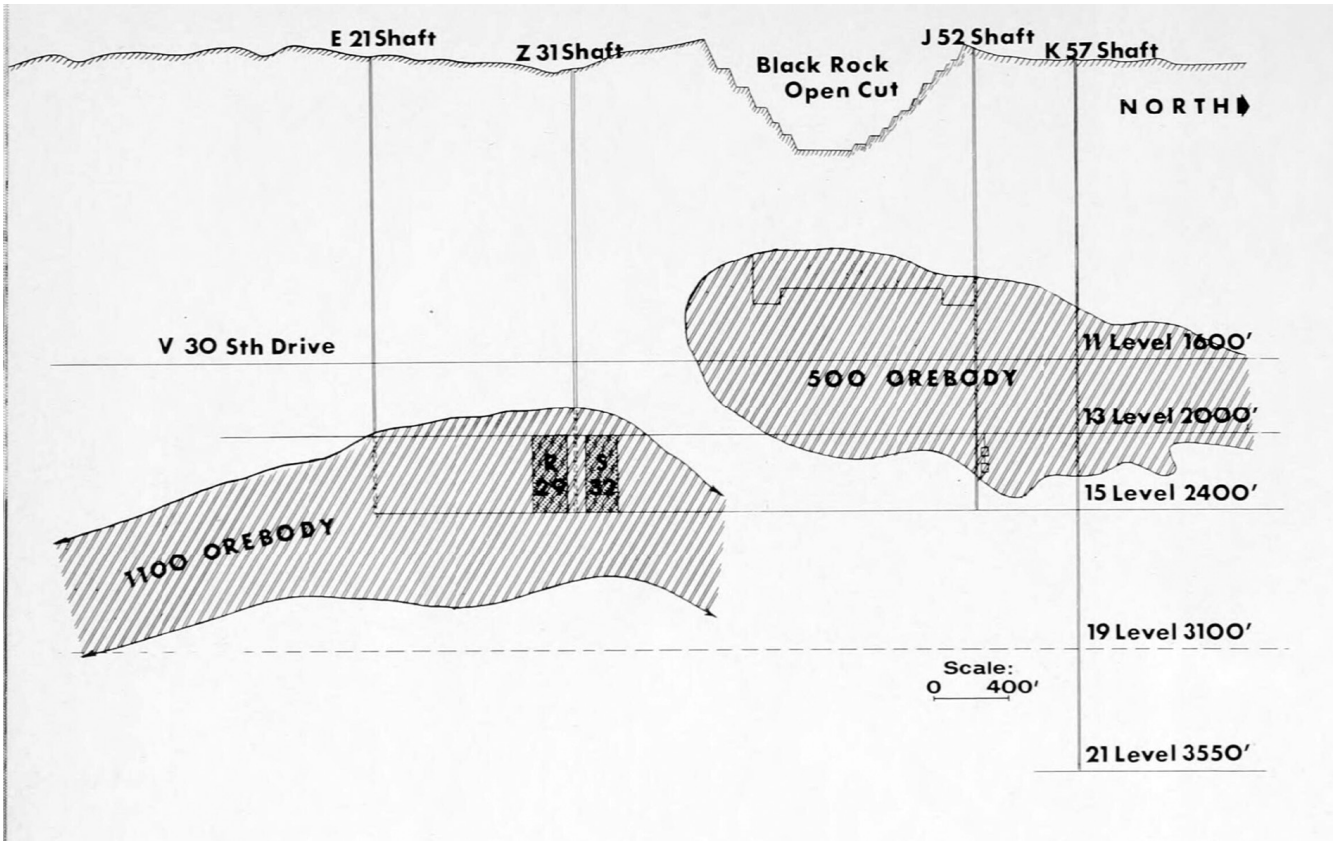
From the grizzly on 15 Level, the ore fell away nearly 1000 feet to the new secondary crusher below 20 Level. Explained Shafts and Hoisting Shift Boss Len Forster: "Between 15 Level and the crusher there are two chain controls through which we can regulate the flow of ore. During this early production period we have also been running development mullock from 17 Level through the new crushing station and then hoisting it in K 57. While we are doing this we hold back the ore at the 17 Level chain control."



Alongside where Gordon Ward operated the new crusher, construction of the second unit was going ahead and this will be followed by a new primary crusher installation above 20 Level to complete the K57 complex.

At the loading station on 21 Level, Skipman Mick Devane regulates ore flow to the skips.

Below the crushers on 21 Level, ore is carried on a 42 inch conveyor belt to the fully automatic measuring and loading station for haulage in the twin, in-balance skips which have a rated capacity of 800 tons an hour. Again during the running-in period, operation was on a semi-automatic basis with a signalling system in use to indicate to the winder driver on the surface when skips were loaded and ready for hauling.





At surface, ore is discharged from the skips to conveyor below K57 headframe. Operators are Btian Simpson (left) and Arturo Arguelles.