

'Missing link' discovered in Rio Tinto's 5,000 years of mining history

Discovery of stone mining tools among the mountains of ancient slag at Rio Tinto, and other finds in a nearby village, have combined to help establish an almost unbroken sequence of mining operations in this area of Southern Spain, stretching from the 3rd millennium BC to the present day. No other working mine in the world has such a record of longevity.

The "missing link" in Rio Tinto's history was discovered last summer during exploration by an IAMS team, led by Professor Beno Rothenberg.

In 1977, an expedition working on the northern slope of Cerro Salomon — the mountain that dominates the Rio Tinto complex — had established that silver-smelting began there as early as the Late Bronze Age,

well before the Phoenicians developed a large silver industry in the 8th century BC. Last summer, work centred on an area to the east, along the banks of the Rio Tinto, where massive dumps of ancient copper slag are to be found.

It has long been accepted that Rio Tinto was a major source of copper for the Roman Empire, but there was no evidence of earlier mining of the metal in the locality. The object of the IAMS expedition was to find such evidence, if it existed, and to piece together the smelting processes employed to produce the finished copper.

Trial excavations of some of the smaller slag heaps did not at first produce any pre-Roman layers, but at one location two stone implements were found on the surface. These tools were shaped and grooved to fit onto a wooden handle in a fashion well known from the earliest mining picks and hammers found elsewhere in Europe and the Middle East. For many years — perhaps from the beginning of the present century — these tools had been lying on a heap of shale, cut from a nearby mountainside and dumped on top of the Roman slag by road-builders.

Discovery of the tools, which can be dated to at least the 3rd millennium BC, led to a search for ancient mine workings in which they could have been used. Close inspection of the tip in which they had been found revealed several pieces of rock, heavily mineralized with malachite — just the sort of ore the ancients would have been looking for.

Aerial photographs of the district were studied for traces of ancient workings, but recent mining at Rio Tinto has left very little of the "original" surface, and nothing was found.

"For days", says Professor Rothenberg, "I wandered

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Site of the 2nd millennium BC cist tomb at Nerva, near Rio Tinto, which helped to provide the "missing link" in the mines' history

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round the eastern side of Rio Tinto, searching systematically for any clues. More pieces of malachite turned up, and eventually one day I found myself in front of a great cliff of shale, topped with gossan. There, I saw a huge cavity, which looked somewhat odd, and on closer examination, I could see a primitive shaft leading into it.

"Our Spanish geologist confirmed that this was most likely an ancient mine, but it was not yet possible to



Stone mining tools, dating to the 3rd or 4th millennium BC, discovered at Rio Tinto. These are the earliest mining tools yet found in Europe

determine what material was mined there. However, outcrops of copper or ore could have been located everywhere in this area and the ancient miner would naturally have probed them.

"A few days later, a young amateur archaeologist who lives nearby showed me two stone chisels, or axes, and a small bowl that he had found close to the village of Nerva. When we later visited the spot with him we found the remains of a roughly-excavated cist tomb, related to the Argar culture of Southern Spain, the early 2nd millennium BC. Surface finds indicate the presence of more similar

burials in the area.

"This was the 'missing link' in Rio Tinto's history, the link between the earliest mining — dated by us to the beginning of the Early Copper Age (the Chalcolithic period, 4th-3rd millennium BC) — and Rio Tinto's large silver and copper industry of the 1st millennium BC.

"The discovery of cist tombs near Nerva is not, of course, proof that mining took place there in the 2nd millennium, but it does show that there was a community, and I cannot imagine that people would have come to these mountains for any other reason as the agricultural potential must have been virtually nil. However, this is something that we have to investigate further".

Tartessian era

A preliminary appraisal of Rio Tinto's mining history indicates that the story began in the 3rd, or perhaps the 4th, millennium BC, with mining with primitive stone tools, and presumably, simple, hole-in-the-ground smelting. The area continued to be inhabited during the 2nd millennium, and then again around 1,000 BC when silver mining and smelting began on a large scale. This was the era of the Tartessians, whose industry and riches first drew the Phoenicians to trade with this part of the world.

Silver mining continued in the Iberian and Roman Periods, though it would appear that the Romans did not at first concern themselves greatly with the actual production of the metal; it was not until the reign of Augustus and the strengthening of the Roman hold over Southern Spain that they took over the operations with hardly any improvements to the metallurgical processes.

Copper is a different story: the slag heaps prove that it was the Romans who began copper production on a big industrial scale. There is also now evidence of iron-making and iron-working in Roman Rio Tinto.

International symposium at Timna in September

The first in a series of international symposia, to be held every two years at the major centres of ancient metal production, is to take place from September 14 — 19, 1981, at Eilat in Israel, centred on the Timna Valley and other important sites in the district.

The idea for a bi-annual symposium at the site of some of the most important archaeo-metallurgical discoveries has been initiated by IAMS, but the conferences will be planned and organized in collaboration with scientific institutions of the host country. The event will combine a series of papers and discussions with tours of the archaeo-metallurgical and related archaeological sites. Where possible, tours will include visits to museums and to sites of significance to the cultural background of the ancient metal industries.

The Timna symposium has been convened in collaboration with the Israel Institute of Metal, Technion-Israel Institute of Technology, Haifa, and the Institute of Mining and Metals in the Biblical World, Museum Ha'aretz, Tel Aviv. Mornings have been reserved for visits to the sites; afternoons and evenings for lectures and discussions; and there will be optional additional days for visits to Jerusalem, Tel Aviv (the Timna Pavillion), Haifa, the Negev and Galilee. It is also hoped to arrange visits to Sinai and Egypt.

Application forms and further details can be obtained from:

The Organizing Committee,
First Symposium on Archaeo-Metallurgy,
PO Box 29784,
Tel Aviv, Israel.