Miners’ tombs help date early work at Rio Tinto

Discovery of ancient graves on a hilltop overlooking present-day mining operations at Rio Tinto in Southern Spain has shed light on communities of miners and metallurgists who worked there some 6,000 years ago.

As part of the fieldwork in a new project to unravel the history of the Iberian Pyrite Belt, IAMS teams, led by Professor Beno Rothenberg and Professor Antonio Blanco-Freijero, have followed up a number of finds of prehistoric materials and installations made by local people.

At Rio Tinto it was learned that a dolmen and a cist cemetery had been found by youngsters from Nerva, a village on the flanks of a hill on the fringe of the modern mine plant.

Although the dolmen had been cleared of pottery and other relics by the villagers, its structure was well preserved, and was identified as a “passage grave”, typical of the Late Neolithic and Early Copper Age in this part of Europe.

Consisting of a chamber, built of large, flat rocks set on edge, the tomb was entered by a narrow passage, similarly constructed. Originally both tomb and passage were capped by other flat rocks which were found lying around in the vicinity. The structure was covered by a round mound of earth, some 13 metres in diameter, its circumference marked by boulders.

Built as a communal grave for a family or small community, the dolmen’s passage was kept open to accommodate more bodies when the burial chamber itself was full.

Between the end of the passage and the burial chamber, a gateway had been carefully constructed and here a pile of large, smooth, egg-shaped pebbles was found blocking the entrance. This was a unique discovery: there was no obvious explanation for the presence of these stones but it was felt possible that they were associated with some kind of burial ritual rites practised at the time.

“This dolmen clearly belongs to the earliest forms of

Left: The burial chamber of the Rio Tinto dolmen is seen in the centre of the mound at the end of the passage. Below: These egg-shaped pebbles were found in the passage. There is as yet no conclusive explanation why they were placed there
megalithic burials known to us”, reports Professor Rothenberg, “and is contemporaneous with the first urban settlements of Iberia.

“The Rio Tinto dolmen is similar to four others which we have examined at the Early Copper Age mine of Chinflon, in the mountains a few miles to the south, and it is this type of structure which we can see spreading northwards across the continent, through known mining areas in Portugal, Brittany, and beyond the English Channel into Cornwall and Ireland.

“There is no doubt in my mind that these were the tombs of some of the world’s earliest miners. Grooved stone picks and other mining tools have been found in the hills around Rio Tinto and these belong to a primitive mining technology which was developed during this stage of megalithic building in Iberia.

“Their discovery in close proximity to the dolmen is a clear indication of mining activity at Rio Tinto in probably the 4th millennium BC.

“Even so, I feel that these finds do not represent the very beginnings of metallurgy in Iberia. I believe that the history of metals in the Peninsular starts at an earlier phase of the Neolithic period. Our continued investigations are aimed at finding evidence for this assumption.”

Cist burial

In 1981, IAMS fieldworkers inspected a cist burial site which had been excavated by a young man from Nerva (see IAMS Newsletter No. 2, 1981); its size and shape were recorded, and drawings and photographs were made of pottery and stone tools recovered from the grave.

A follow-up visit has revealed the remains of eight further graves and an examination of sherds found at the site indicates that this was a cemetery of people of the El Argar culture, dating to the Early Bronze Age – the

continued opposite
2nd millennium BC.

Unlike the dolmen, which were communal tombs, these were individual burials in simple stone coffins, built into the ground. One, however, larger than the rest, had probably contained the bodies of a man and his wife, and alongside it was a much smaller one which may well have been for their child.

A heap of stones, disturbed and abandoned by local treasure hunters, was noticed in the vicinity of the cemetery and excavated by the IAMS team. Beneath the stones they found a small oval pit, cut into the bedrock. In its hard “fill” were many sherds identical to the Argaric ware found in the cists. There were also nodular lumps of slag, and part of a tiny clay crucible, no more than 8 cm. in diameter, with metallic encrustation. Analysis showed that this crucible had been used, not, as at first thought, for copper casting, but for silver making, and may well be the earliest cupel found to date.

Following an ancient well-paved path on the southern outskirts of Nerva, the IAMS explorers came upon a stone fence encircling a hill between Nerva and the Rio Tinto mine.

“The whole area above this fence was found to be covered by ancient ruins”, says Professor Rothenberg. “It quickly became obvious that treasure seekers had indeed located many pieces of metal, but as these turned out to be ‘worthless’ lead or litharge, they left them alone.

“There was also much slag of different types, heavy pieces of spess and even pieces of metallic silver. A large number of sherds indicated an Iberian-Rome date, though remains of earlier periods may yet be found.

“Among items of special interest, we found jewellery and tools, a seal, coins, a silver ingot and four large iron bars, as well as finely decorated Iberian and Roman pottery.

“The metallurgical remains and workshops visible all over the hill indicate a large-scale silver-working site, from cupellation to finished silver objects. Whilst the huge slag deposits of Rio Tinto are mainly the debris of primary smelting of silver, copper and iron, the remains on the hill near Nerva represent a technological follow-up, and their study promises new archaeometallurgical information of great importance.”

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Bristol conference on history of zinc and brass

The recent successful excavation of medieval zinc furnaces in India (featured in IAMS Newsletter, June 1984) lends special interest to a conference on the history of zinc and its principal alloy, brass, to be held on June 7-9 next year.

Appropriately, the venue will be Bristol where the English pioneer, William Champion, designed and built his zinc smelting furnace in 1738. The event is being organized by the University of Bristol in conjunction with the Historical Metallurgy Society and the British Museum.

Work done in Bristol over the past 20 years has gone a long way to establish the history of brass-making there and its origins on the continent. Efforts are being made to preserve the remains of the industry and its products.

As well as papers describing the progress of these endeavours, important work on Roman and medieval brass-making will be discussed.

There will also be a visit to the site of Champion’s Warmley Company and the Salford brass battery mill.

Further details can be had from Dr. Paul Craddock, Research Laboratory, British Museum, London.
Fifty years of archaeological teaching and research

Since its formation in 1973 IAMS has worked closely with the Institute of Archaeology at the University of London where it provides lectures in archaeometallurgy as part of the degree-awarding courses. By far the biggest archaeological teaching and research unit at any United Kingdom university today, the Institute was founded some fifty years ago by Sir Mortimer Wheeler, who raised British archaeology to new heights and became the greatest excavator of his age. Sir Mortimer helped to launch IAMS and was a Trustee at the time of his death in 1976.

Robert Eric Mortimer Wheeler – known always to his friends as Rik – conceived the idea of an Institute of Archaeology while excavating Roman sites on behalf of the National Museum of Wales, of which he was Director, in the 1920s.

"In my latter days at Cardiff my mind turned increasingly to the need for systematic training in a discipline which was emerging from the cruxalis stage", he wrote in his autobiography (Still Digging, London, 1955).

"Students were increasing in numbers; archaeological posts were slowly beginning to multiply. Something had to be done about it, and, looking round in my war-depleted generation, I could see no one but myself to do it – such was the poverty of the land. During the early months of 1926 I drew up a detailed scheme for a university Institute of Archaeology such as nowhere existed in this country."

Although there had been a Chair of Archaeology at Cambridge University since 1951, digging up the earthy past had hitherto been largely the pursuit of the enthusiastic amateur, and – in the eyes of many people – the wealthy eccentric. In the 19th century an heroic tradition of excavators had come into being, beginning with Layard and Mariette, and continuing with Schliemann, Flinders Petrie, Pitt-Rivers, Arthur Evans, Leonard Woolley and a few others. Wheeler himself was perhaps the last of this distinguished line. He was determined to replace it with an entirely new concept of archaeology which he set out to achieve by a harnessing of science and the humanities which would "bring to civilization something of the function which the laboratory has long fulfilled in the study of chemical or physical science... a place where the archaeologist would seek the collaboration of the geologist, the botanist and the palaeontologist."
was energetically assisted by his wife Tessa – coincided with his direction of a series of highly successful excavations, including the Roman sites of Lydney Park in Gloucestershire, at Verulamium, present-day St Albans; and perhaps even more exciting, the Iron Age hill-fort at Maiden Castle in Dorset.

Ever alert to publicity, Wheeler made sure that the media were kept fully informed of what he was doing. Very soon archaeology – the “dry as dust” hobby of the eccentric – began to capture the imagination of the general public and to attract support to regularize its teaching.

The big problem, as always, was money. In a lecture to the Royal Society of Arts in 1927, Wheeler declared that £70,000 would be needed to create an efficient school of British archaeology, but later he was forced to lower his sights.

As an alumnus of University College, Wheeler felt that, through the College, London University “might be led gently into the garden and right up the path.” In 1928 University College awarded him a new lectureship, “tenuous, unpaid and unrenowned”, but he used it, quite unashamedly, to promote his efforts for an Institute.

**Television star**

The breakthrough eventually came from an unexpected source. In 1932 Wheeler heard that Sir Flinders Petrie, then in his 80th year, had formulated some ideas of his own for the accommodation of archaeology in the new university buildings in Bloomsbury then being planned. He sought out the old man who promised his full collaboration.

Sir Flinders was good to his word. A few months later, when planning his retirement in Palestine, the famous Egyptologist faced a problem of finding a home for part of his enormous collection, then stored in some disorder in a multitude of packing cases. When a generous friend came to the rescue with an offer of £10,000, Petrie, with equal generosity, promptly passed on the cheque to Wheeler, stipulating only that space be found for his collection when the Institute was established.

Although Petrie’s gift represented only one-seventh of the sum originally estimated to be the minimum for endowment, this was enough to get the Wheelers started. After much negotiating, London University agreed that the scheme should go ahead. Sir Charles Peers, Director of the Society of Antiquaries, became chairman of a committee to appeal for public support, with Tessa as secretary. Together they worked energetically and two years later, in 1934, the London University Institute of Archaeology came officially into being – if only on paper.

**Home in the Park**

The most urgent need now was to find suitable premises. “We scoured London for the impossible, a large building at next to no rent,” wrote Wheeler. Incredibly, they found just what they wanted. St John’s Lodge, on the “inner circle” of Regent’s Park, had been built in the “Grecian style” as part of John Nash’s original design for the Royal Park early in the 19th century and had later been much enlarged: it boasted two libraries and a domed ballroom, big enough to house the contents of Petrie’s packing cases. For years the lodge had stood empty since serving as a wartime hospital, derelict and unwanted in its beautiful surroundings. The Wheelers secured it at a “pepper-corn” rent and set about its restoration.

Meanwhile staff were recruited and students enrolled. Rik Wheeler himself accepted the post of Honorary Director and Kathleen Kenyon became secretary of the management committee. Three more years were to pass, however, before the Earl of Athlone, as Chancellor of London University, officially opened the Institute on April 29, 1937 – just one year after the tragic death of Tessa Wheeler, who had done so much to bring it into being.

The Institute had barely got into its stride before war continued overleaf
brought its activities to a standstill. Rik Wheeler, who had fought at Passchendaele in 1917, hurried back into the Army to raise an anti-aircraft battery at Enfield. He was later posted to the Western Desert and was in command of 10,000 men of the 8th Army’s anti-aircraft brigade when in 1943 he answered a call from Lord Wavell, Viceroy of India, to reorganize archaeological survey and excavation in the subcontinent. Meanwhile, with the end of the war in 1945, London University assumed full control of the Institute. Professor Gordon Childe, a “formidable prehistorian” of Australian birth, was appointed its first full-time Director and began to fulfill the ideals of scientific training and research for which the Wheelers had worked so hard.

When Wheeler returned from abroad in 1948 after bringing “new inspiration to the study of ancient India”, he found St. John’s Lodge bustling with activity. Kathleen Kenyon was about to relinquish her secretarialship to become Lecturer in Palestinian Archaeology and to start her epoch-making discoveries in Jericho, while Max (later Sir Max) Mallowan, who had been installed in a new Chair of Western Asiatic Archaeology, was getting ready to launch his successful excavations at Nimrud.

Breakthrough

There seemed to be no place for Wheeler who could be offered no more than a part-time professorship — in the Archaeology of the Roman Provinces — which, as he put it, “my friends had discovered for me” in the Institute that he had founded. However, the post gave him a base from which he continued his adventurous career on two main fronts — as a revolutionary Secretary of the ailing British Academy, and as archaeology’s unofficial chief public relations officer, a post which he filled with his customary flair and brilliance, not least as a TV performer in the enormously popular series *Animal, Vegetable, Mineral?*, chaired by his friend Professor Glyn Daniel.

Knighted in 1952, he continued to serve on the management committee of the Institute until his death and remained closely in touch with its affairs. In 1970 he was instrumental in arranging for the archaeological metallurgical discoveries of the Arabah Expedition to be displayed at a special exhibition at the British Museum, and he took a leading part in the foundation of IAMs in 1973.

When Gordon Childe retired as Director in 1956 — just before the Institute moved from St. John’s Lodge to its present premises in Gordon Square — he was followed by Professor W.F. Grimes, who had been Wheeler’s successor at both Cardiff and London Museum. Grimes, a distinguished excavator whose discovery of the London Mithraeum had caused a considerable stir in 1954, continued to hold the post until Professor J.D. Evans took over in 1973.

The Institute today

While the pattern of its activities has naturally changed over the years, the Institute still clings to the basic principles laid down by Sir Mortimer Wheeler in the 1930s — to combine scientific and humanistic elements of the subject in a centre for teaching as well as research.

Today the Institute provides first degrees in archaeology instead of postgraduate diplomas, as was the case up to 1968, and its field training programmes are linked with rescue archaeology projects, funded until recently by the Department of Environment’s Directorate of Ancient Monuments and Historic Buildings — a function which has now passed to the newly formed Historic Buildings and Monuments Commission, chaired by Lord Montagu of Beaulieu.

A Roman pottery seminar at Gordon Square

The Institute attracts financial support for research from various governmental and non-governmental sources, and both staff and students are active in fieldwork in many parts of the world.

Of the twenty or more universities in Britain which now offer archaeology at first or higher degree level, the Institute in London is by far the biggest single unit. At any one time there are some 200 students — more than half of them undergraduates — and there is a teaching staff of 22. Though large by comparison, the organization is yet small enough to encourage the intimacy of a college-type community life.

For convenience the work is divided into five departments: human environment; prehistory; the archaeology of the Roman Provinces (in fact, of the whole empire); Western Asiatic archaeology; and conservation and materials science, under which the IAMs course is offered as part of BA/BSc and MA/MSc degrees.

John Evans, the present Director, has been a member of the University staff since 1956 and for 17 years occupied the Chair of prehistoric archaeology. Among many appointments he is a Trustee of IAMs and a member of its Scientific Committee.

The science factor

Looking back over his long association with the Institute of Archaeology, Professor Evans feels that one of the most significant features has been the development of the scientific element, a trend reflected in the fact that nearly half his staff are scientists. At the same time he looks with satisfaction on the transition of archaeology from the process of looking for objects to the development of what has become a “human ecology”, or, as Mortimer Wheeler would have put it, “digging up people” rather than “digging up things”.

Another development that pleases him is today’s recognition of archaeology as an “educational subject” as distinct from one aimed solely at producing skilled professionals. This process began to become apparent in the 1950s and was accelerated by the popularity of the subject among millions of ordinary people who found themselves fascinated by news of great archaeological discoveries and entertained by TV features such as *Animal, Vegetable, Mineral?*

All these are factors which have not only helped to build the Institute but have also contributed to establishing Britain in the high place which it occupies in world archaeology today. Those who work at Gordon Square can be proud of the part that they and their predecessors have played in bringing this about.

A.J.W.

Was Ireland a copper exporter in the Bronze Age?

Recent researches in south-west Ireland suggest that the country could have been a net exporter of copper in the Bronze Age, 3500 years ago. Among the principal producers during this period were mines on Mount Gabriel, described here by Dr. John S. Jackson, late of the National Museum of Ireland.

On the Mizen Peninsula, fingerling into the Atlantic and forming part of the indented south-west corner of Ireland, the impressive bulk of Mount Gabriel rises 408 metres above sea level.

The Old Red Sandstone mass commands panoramic views over Roaringwater Bay and, across a scattering of islands, southwards to the isolated rock on which the Fastnet lighthouse stands. Mount Gabriel, scored and moulded by transient ice, was later covered by peat, which now survives in residual patches on the lower slopes and as a periglacial blanket bog at the summit.

Over the years, the Bronze Age copper mines of Mount Gabriel became hidden beneath the blanket peat which grew over the portals of the drives into the mountain, effectively sealing them and protecting them from medieval and later exploitation. In their pristine state they were eventually exhumed by peat-cutting in the late 19th and the present centuries, and were first brought to scientific and archaeological attention in the late 1920s. Thirty-one drives have been recognised to date.

A remarkable concentration of Bronze Age megalithic monuments in west Cork and south-west Kerry indicate a sizeable population which was, presumably, contemporary with the mines. These include wedge tombs (or wedge-shaped gallery graves), stone circles and stone alignments – examples of all of which occur quite close to Mount Gabriel.

Radiocarbon dating

The Bronze Age date of these mines was recently questioned and a late 19th century AD date proposed. It was also suggested that the mine workings post-date the blanket peat and that the tip-heaps therefore accumulated above the peat surface.

The criteria on which both these proposals were based have now been shown to be invalid and recent radiocarbon dating by the British Museum Research Laboratory reasserts the Bronze Age date ascribed to the mines in 1968.

In 1981, samples of peat were collected from the interstices between the broken rock mine-waste at the extreme top of a tip-heap outside one of the mines, and these were radiocarbon dated by the British Museum at around 1250 BC. Since these samples in effect represent the base of the blanket peat, the radiocarbon date also dates the bog base on Mount Gabriel.

Recent work on the Beara Peninsula, to the north of Mount Gabriel, has shown that at Cashelkeelty the base of the bog can be as old as 4690 BC and as young as 913 AD and 1157 AD. The peat accumulated at Cashelkeelty at a rate of 0.41 mm per annum over a period of some 5,845 years, building up blanket bog to a thickness of 3 metres. This is a relatively slow rate compared with the raised bogs in the Irish midlands which, in their upper levels, accumulated three times faster.

Since the base of the peat on Mount Gabriel dates to continued overleaf
Mount Gabriel
continued from page 7

1250 BC and a thickness of 1.54 metres of peat has been recorded from near the main concentration of mines on the mountain, this thickness would indicate a rate of peat growth in the order of 0.48 mm per annum, reasonably close to that at Cashelkeelty.

At Derrycarhoon, eight kilometres north-east of Mount Gabriel, the peat overlying the extensive tip-heaps of a substantial Bronze Age copper mine has been studied palynologically and pine pollen shown to be present. Since pine died out in Southwest Ireland in about 1140 BC, this peat must be older than that, and the underlying mine waste older still.

Since the blanket peat on Mount Gabriel overlies and "seals" the tip-heaps, it is apparent that the mine waste in the tips is older than the base of the peat, which has been shown to be around 1250 BC. Charcoal, generated by fire-setting in the mines, and collected from one of the tips, was radiocarbon dated by the Radium Institute in Vienna to 1500 BC.

250 years of operation

So, although it cannot be stated with precision, it may be assumed that the mines on Mount Gabriel operated for a maximum period of some 250 years (from 1500 BC to 1250 BC), but probably less. It was doubtless the serious deterioration in the climate which started the growth of blanket bogs in the area that drove the Bronze Age miners from the mountain.

The mines therefore belong exclusively to the Early (Irish) Bronze Age, a date which is consistent with the limited range of artefacts so far recovered from them: mostly stone mining mauls — many of them grooved — and wooden wedges, assumed to have been used in conjunction with the mauls to lever fractured rock away from the mine walls.

Production of copper from Mount Gabriel in those days has been estimated at 163 tonnes of metal, yielding, at an assumed 90 percent smelter efficiency, 146 tonnes of smelted copper.

With this substantial production from one area, it has been suggested that Ireland was a net exporter of copper during the Bronze Age. This is consistent with evidence from Britain where contemporary Wessex culture (1600-1400 BC) was characterised by two concurrent metal traditions: one, bronze with Continental association; the other, arsenical copper with strong

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Irish affinities.

No smelting sites have yet been found on Mount Gabriel. However, postgraduate research at the Department of Archaeology, University College, Cork, will shortly be directed to a comprehensive field programme on the Bronze Age mining of west Cork and south-west Kerry, and it is confidently predicted that substantial advances will be made in our knowledge in the next few years.

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