



Mount Gabriel with Letter Hill to the right. Old Red Sandstone outcrops protrude through blanket bog in foreground and middleground. Picture – J.S. Jackson

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, 3 500 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, fingering 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 periwig of 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

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Mount Gabriel

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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-heap 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 artifacts 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



Stone mining mauls and copper ore in white quartz gangue from Ross Island, Killarney. Picture – J.S. Jackson

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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