

BRITISH MINING No. 52

# GREAT ORME MINES

C.J. WILLIAMS



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A history of the

# GREAT ORME MINES

from the Bronze Age to the Victorian age

by

C.J. Williams



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*Cover Illustration: Artist's impression of the Great Orme mines in the Bronze Age.  
(Gwynedd Archæological Trust).*

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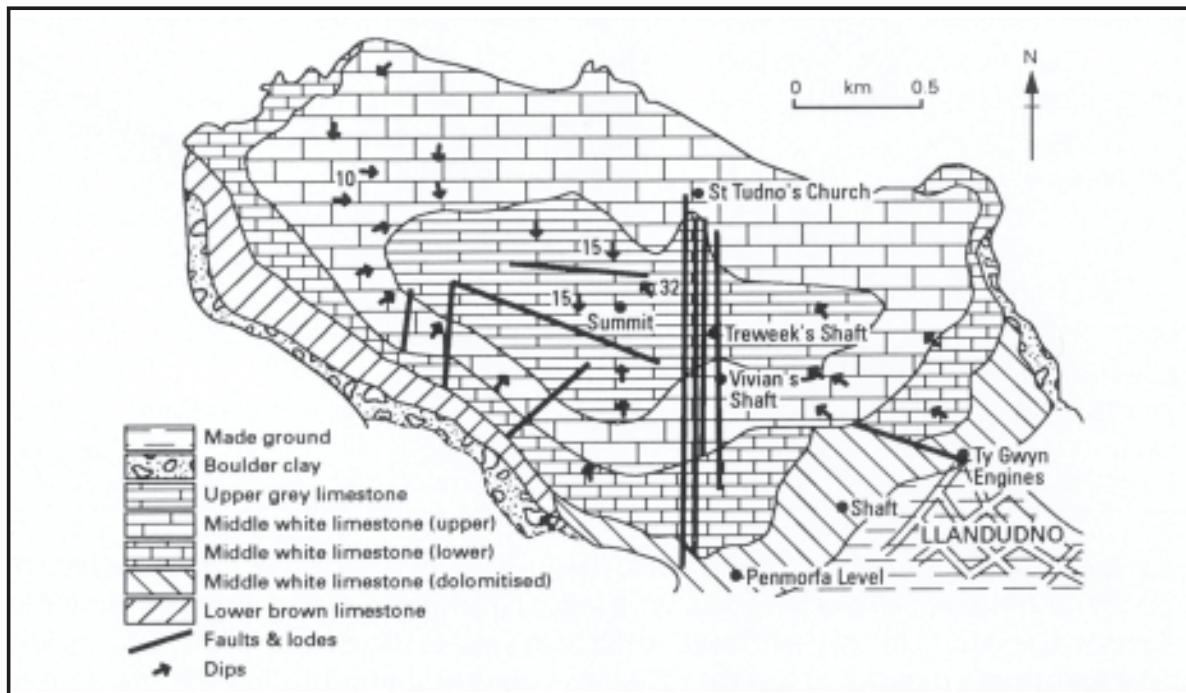
Llandudno at the end of the mining era: detail from plan in Parry's *Llandudno: Its History and Natural History* (1861), with some additional information (not to scale). The open common land on the Great Orme belonged to the Bishop of Bangor, as lord of the manor of Gogarth. The Old Mine was on this common. The enclosed lands were the property of the Mostyn family, and it was under these, particularly in the Pyllau area, that the New Mine worked. The telegraph near the summit of the Great Orme was one of the chain of stations used for signalling from Holyhead to Liverpool. Opened in 1827, it was replaced by an electric telegraph in 1860.

## INTRODUCTION

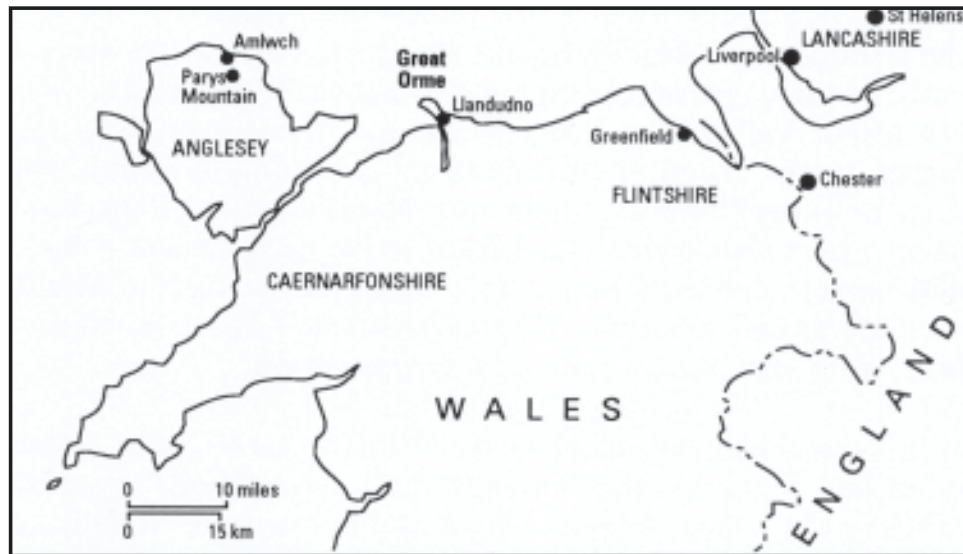
The Great Orme's Head, Llandudno, is an isolated promontory of the Carboniferous Limestone that outcrops along the coast of north Wales. Rising to a height of 679 feet above sea level, it consists of over 1000 feet of limestone of Lower Carboniferous age, deformed into a gentle syncline, and traversed from north to south by at least four near-vertical faults. Additional faults encountered during mining dip south-eastwards at  $45^{\circ}$ - $80^{\circ}$ , and trend north-east to south-west and north north-west to south south-east.

To the east, in Denbighshire and Flintshire, the limestone bears extensive lead and zinc deposits, but at Llandudno the mineralization is almost exclusively copper, although minor amounts of lead ore have also been mined. Four main veins were worked, the largest deposits being found at the intersection of two veins known as the 'Hanging Mawr' (Great Slide) and the 'Gyllath' or 'Cyllell' (Knife) veins. The main ore, chalcopyrite, occurred from the surface down to depths of at least 600 feet. Alteration and secondary enrichment resulted in carbonate ores, mainly malachite and minor azurite, both at surface and in localized horizons. Small amounts of native copper were also found.

The Llandudno mines have been worked in two widely separated periods. The one nearer to our own day is documented from the 1690s, and lasted until just over 100 years ago. It is with this second phase of activity that this booklet is mainly concerned. My own interest in the mines dates from the late 1960s, when members of what was to become the North Wales Caving Club explored the workings of the



*Geological map of the Great Orme, after G.H. Morton, 1898. The main veins worked by the miners were the four parallel ones running north to south, and the one in the Ty Gwyn Mine.*



*Location map showing the importance of the sea as a means of transporting ore to Lancashire, Anglesey, Flintshire and Swansea, and bringing back coal and other goods to the mines.*

Old and New Mines, and entered the Penmorfa Level, which had been inaccessible for perhaps half a century. This exploratory work, and evidence from widely scattered documentary sources, resulted in a monograph published by the Northern Mine Research Society in 1979. This has long been out of print, and several factors made a revised version of it necessary. The first was that an amateur archaeologist, Duncan James, recognized in the mid-1970s that some of the workings dated from the Bronze Age, a fact confirmed by radiocarbon dating. Later archaeological work by the Gwynedd Archaeological Trust, and investigation by members of the Early Mines Research Group, has shown that these early mine workings were even greater in surface extent than was initially believed. This booklet draws on the published interim results of this work to give a brief account of Bronze Age mining, but excavation is continuing, and will undoubtedly add more to our knowledge of this period. The second factor was that in 1986 the Great Orme Exploration Society broke into the Ty Gwyn Mine, so providing new information on this sparsely documented concern. Thirdly, 1991 saw the opening of the mines to the public by Great Orme Mines Limited. Copper mining at Llandudno, which had been eclipsed by the rise of the Victorian resort, has now become a part of the tourist industry.

Llandudno was only one of the groups of Caernarfonshire copper mines – there were others in Snowdonia – but it was by far the most successful. Information on ore production at Llandudno is scanty, but it is likely that it amounted to between 2000 and 3000 tons of copper metal. Such figures, however, are dwarfed by those of the mines on Parys Mountain, Anglesey, where enormous quantities of low grade ores were worked from the 1760s until the early years of the 19th century. The output of these mines was controlled by Thomas Williams of Llanidan, the ‘Copper King’, who for years was virtually to monopolize the industry, previously dominated by the Cornish mines. Ore from Parys Mountain, and from Llandudno



and the other Caernarfonshire mines, was taken by sea to the coalfields of Lancashire and south Wales for smelting, until works were built at Amlwch. Much of the copper metal smelted in Lancashire or at Amlwch was taken to the Greenfield Valley near Holywell, where it was manufactured into a variety of copper goods. These included copper sheathing to protect the hulls of wooden ships, and copper bolts to hold these vessels together. Pans, bowls and other small articles were also made, for a market on the west coast of Africa, where Liverpool merchants traded them for slaves to be carried across the Atlantic and sold in the West Indies and America. Thomas Williams's beautiful coins, bearing a druid's head, were also minted for a time at Greenfield.

Even before the death of Thomas Williams in 1802, the output of the Anglesey mines had begun to fall. It was in the early 19th century, particularly from the 1830s to the 1850s, that the Llandudno mines enjoyed their heyday. Ore worth over £250,000 is said to have been raised at Llandudno in the years from 1835 to 1848. The latter year, however, saw the abolition of the duty on imported copper. This, combined with the opening up of reserves overseas – in Australia, north America and Chile – which could be worked on a far larger scale than British ones, reduced Britain's share of the world output of copper to a smaller and smaller proportion, and brought an end to the Welsh copper-mining industry.

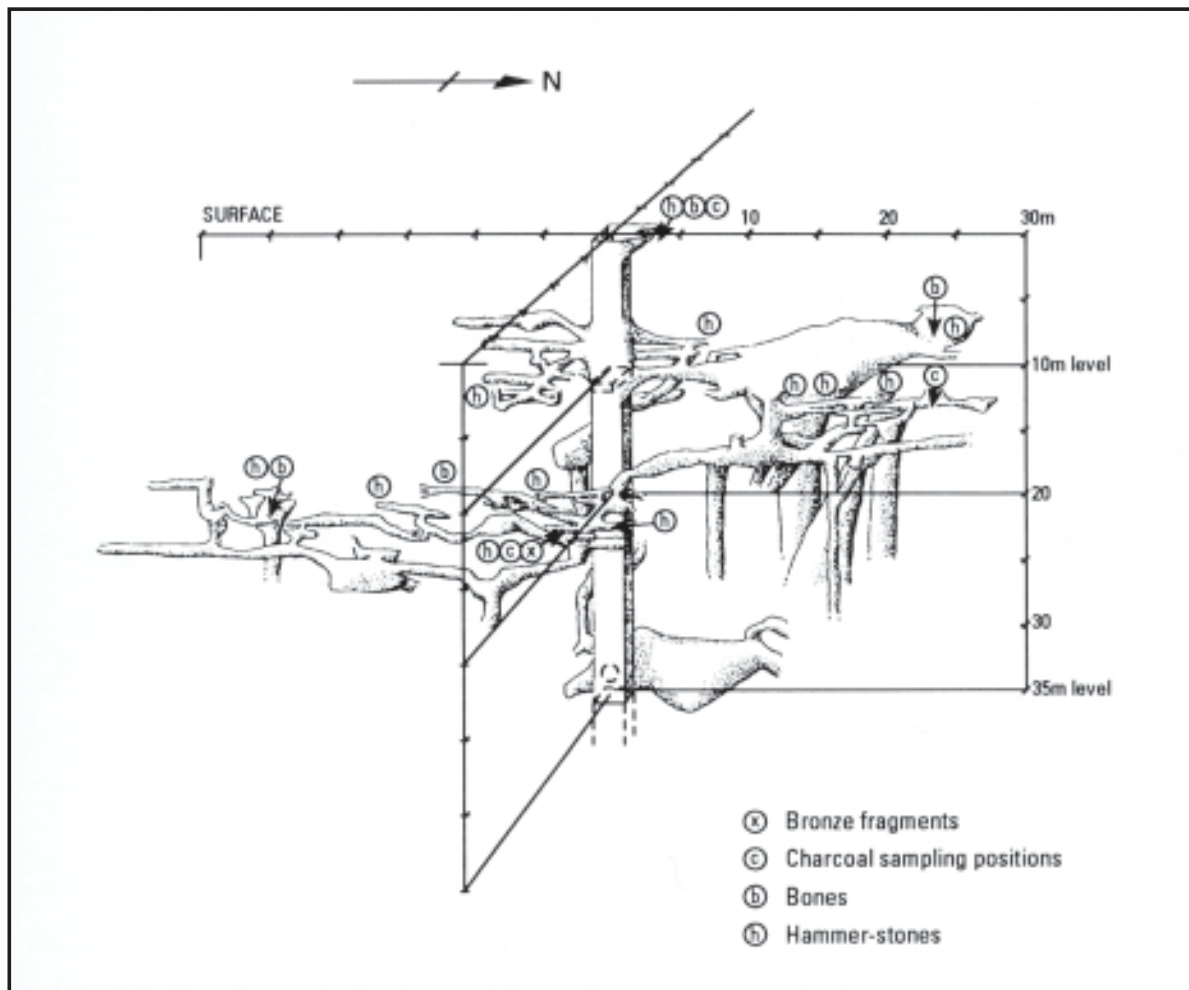


*Archaeological work at the Great Orme Mines (E.R.D. Roberts).*

## 1. PREHISTORIC AND ROMAN MINING

It has long been known that the Llandudno copper mines are of great age. The 19th-century miners were well aware that these mines had been worked in antiquity. In 1849 men broke into a cavern about 40 yards long, in which they found stone hammers weighing between one and fifty pounds, and a number of deer-bone implements, but within three months this cavern had been blasted away. A similar discovery had been made in 1831. In 1917 a former miner, John Hughes, who had started work in the mines in 1837, aged seven, recalled in the *Llandudno Advertiser* that “*the ancient mines went down fairly deep, as the later miners found out when they broke into the old workings. Some of the latter were very large places indeed and a great deal of copper must have been taken out of them.*” Roman coins are said to have been found in the mines in the 19th century, but none of these, nor exact details of where they were found, have survived.

The great authority on Roman mining, Oliver Davies, investigated the Llandudno mines in 1938-9. Unfortunately, he was not able to enter the mines, as all entrances to them had been effectively sealed. He did find stone hammers in the dumps of mine waste in the Pyllau area, however, and more at a settlement site



*Simplified view of early workings near Vivian's Shaft.*