

EXTRACT FROM ENGLISH HERITAGE'S RECORD OF SCHEDULED MONUMENTS

MONUMENT: Marrick Cupola lead smeltnill, 160m east of Reels Head Farm

PARISH: MARRICK

DISTRICT: RICHMONDSHIRE

COUNTY: NORTH YORKSHIRE

NATIONAL MONUMENT NO: 28912

NATIONAL GRID REFERENCE(S): SE06339875

DESCRIPTION OF THE MONUMENT

The monument lies on a modified natural terrace on the north side of Swaledale and includes the ruins, earthworks and slag tips of an early reverberatory lead smeltnill.

Construction of Marrick Cupola smeltnill commenced in 1700, and smelting began in 1701. It was operated by a partnership led by John Blackburne and his agent Reuben Orton, and smelted ore from a range of mines in the Yorkshire Dales; coal was supplied both from Wensleydale and from County Durham. From 1704 onwards, the partnership was embroiled in complex legal disputes regarding the smeltnill and various mines, and by 1723 the smeltnill was abandoned.

The smeltnill itself survives in the form of a ruined rectangular stone building, measuring approximately 35m by 8m and standing up to 1m high above modern ground level. It is terraced into the base of a steep natural slope. On the slope to the north, areas of bare lead contaminated ground indicate the presence of archaeological deposits associated with the smeltnill, and a length of rubble, running north from the east end of the building, is thought to represent the remains of a small flue. To the south and south east of the smeltnill ruins lie extensive slag tips and to the west is shallow terrace extending as far as the field wall. The slags are unusual in character and contain considerable amounts of lead and lead minerals, illustrating the inefficient nature of early reverberatory smelting, and forming an important resource for the scientific study of the early development of reverberatory smelting technology. To the west a prominent access track is cut into the slope and extends north east from the ruins of the smeltnill to the field wall.

ASSESSMENT OF IMPORTANCE

Approximately 10,000 lead industry sites are estimated to survive in England, spanning nearly three millennia of mining history from the later Bronze Age (c.1000 BC) until the present day, though before the Roman period it is likely to have been on a small scale. Two hundred and fifty one lead industry sites, representing approximately 2.5% of the estimated national archaeological resource for the industry, have been identified as being of national importance. This selection of nationally important monuments, compiled and assessed through a comprehensive survey of the lead industry, is designed to represent the industry's chronological depth, technological breadth and regional diversity.

The reverberatory lead smelt mill was developed in the late 17th century, and marked an important stage in the development of the switch from wood to coal fuel which rendered the Industrial Revolution possible. The reverberatory smelt mill was a rectangular enclosed structure of stone or firebrick held by iron strapping, within which ore was smelted by the heat of flames from a separate coal fire in one end, reflected down onto the ore by an arched roof. The separation of fuel from ore made the use of coal possible. A chimney (or flue to a separate chimney) at the far end from the fire provided the draught to draw the flames over the ore; no air blast was used and, consequently, water power was not required. Early reverberatory lead smelt mills consisted simply of a large barn-like building containing the furnaces, with chimneys projecting from the outer wall. Late 18th and 19th century smelt mills were often large complexes containing several smelting furnaces, together with slag hearths for extracting lead from the slags, roasting furnaces for preparing the ore, refining furnaces for extracting silver from the lead by a process known as cupellation, and reducing furnaces for recovering lead from the residue or litharge produced by cupellation, together with sometimes complex systems of flues, condensers and chimneys for recovering lead from the fumes given off by the various hearths and furnaces. Reverberatory smelt mill sites will also contain fuel stores and other ancillary buildings. Many of the later sites used water power to provide the air blast for the slag hearths. Reverberatory smelt mills existed in all the lead mining fields of England, and also in some coastal areas, using imported ores; about 100 sites are believed to have existed. Since both the buildings and the sites of reverberatory smelt mills were more easily reused than those of ore hearth smelt mills, examples surviving as well preserved field monuments are very rare nationally. All early sites with any structural or earthwork remains, and all later sites retaining a range of structural and/or earthwork features, together with any sites believed to retain the remains of furnaces, whether as exposed ruins or as buried stratigraphy, will merit protection.

The Marrick Cupola smeltmill is one of the earliest examples in England for which any remains are known to survive. The remains are unusually complete for a monument of this type and date, and the slag tips form an important source of information for the scientific study of early reverberatory smelting. The importance of the site is increased by its good historical documentation and short working life, with little later disturbance.

MONUMENT INCLUDED IN THE SCHEDULE ON 29th April 1998