

Geophysical Surveys on two Yorkshire Blast Furnace Sites, England

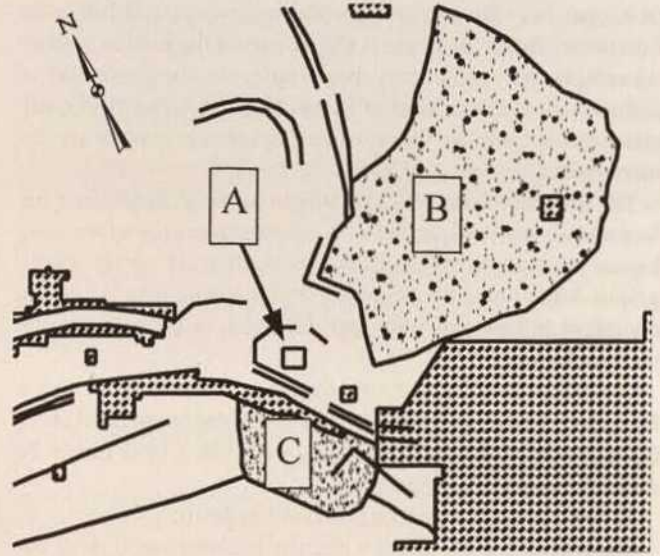
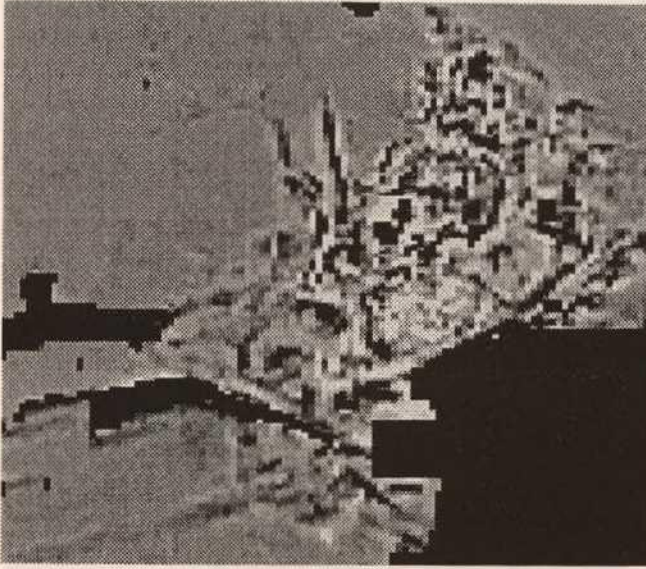


Fig. 1,2. The fluxgate gradiometer data of the Bretton site (Fig. 1) is clipped between -100 nT (white) and 80 nT (black); the interpretation (Fig. 2) locates the furnace (A), ore burning area (B) and the slag dump (C); note the difference in response between B (high iron content) and C (low iron content); surveyed area: $h = 120$ m, $l = 140$ m

Blast furnaces were introduced into England towards the end of the Medieval period. This paper investigates the use of geophysical surveys for the interpretation of two prominent blast furnace sites in Yorkshire.

A predecessor of such blast furnace, a high bloomery, was revealed by geophysical surveys in Bilsdale to the north of Rievaulx Abbey, North Yorkshire, operated by the Cistercian monks. When the abbey was dissolved in 1538, the new landowner is known to have established a blast furnace in Rievaulx village. Geophysical survey work identified the finery / chafery complex, where the cast iron was processed, with slag tips, charcoal stores and leat systems. Combined with topographical survey work, limited excavations and documentary evidence the approximate location of the blast furnace in Rievaulx village was identified. The geophysical work is limited to open spaces between post-furnace housing and other physical constraints. However, it has been possible to identify the ore-roasting area and the likely source of water for operating bellows.

A second blast furnace site, in the Bretton Sculpture Park, near Wakefield, West Yorkshire occupies a green field site. A leat entering and leaving the site and a slag dump are the only pronounced earthwork features. Slag, burnt ore and charcoal are present in the soil. The blast furnace was operated in the 18th century by the same Yorkshire partnership who were also associated with a second furnace at Rockley, located 10 km south of Bretton. During the 1980s, the Rockley furnace, which is up-standing, and adjacent casting floors were investigated. By applying information from the Rockley excavation and the geophysical results from Rievaulx it has been possible to produce a very accurate interpretation of the Bretton furnace survey.