

Recent discoveries and excavations of 6th–2nd century BC furnaces in SW Germany

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ABSTRACT: Fieldwork and excavation have given new evidence for Celtic iron production in southwest Germany. Two types of furnace have been recognised, both new to the upper Rhine region. Examples of each type of furnace have been excavated and dated. The later type, of the 3rd–2nd century BC, had a conical shaft over a slag pit, in which blocks of slag accumulated. The earlier type, of 6th–4th century BC date, had a large diameter cupola-shaped chamber, topped by a narrower shaft. It is suggested that this type may have been operated by natural draught. These cupola furnaces may have been a prototype for the large diameter domed furnaces which occur in several regions of Europe in Celtic and Roman times.

Introduction

In connection with the main focus of research of the Volkswagenwerk Foundation, since 1989 the Landesdenkmalamt Baden-Württemberg has investigated the early production of iron in southwest Germany. Two projects on early and high Middle Ages iron production have been successfully concluded, in co-operation with the Deutsches Bergbau Museum, Bochum. One result is that the start of local cast iron production can now be assumed to date to the 11th/12th century AD (Yalcin 1992).

In April 1995 a new project was started, dealing exclusively with remains of the pre-Roman Iron Age. The aim of this project is to improve our understanding of Celtic iron production, to gain reliable results for dating and to establish relationships with other Celtic regions.

Celtic iron exists not only in the form of arms, tools or implements, but in its extended distribution in the form of trade iron, as flat bars or as bipyramidal pointed bars (Kurz 1995). The questions are: Where does the iron come from? Can the discovery of trade iron deposits

lead to the production centres? What are the techniques of smelting? How does the iron go from its place of production to the end-user? Are there a few central production centres or is iron produced only for a regional market or even domestic requirements, dependent on local ore deposits?

Southwest Germany served as an example to locate Celtic smelting places and to examine them archaeologically (Fig 1). This task required a large region of investigation, which was examined on a random basis. According to the geographic structure of southwest Germany three areas were chosen within the most important ore regions. They are two *Bohnerz* deposits, one in the central Swabian Mountains, the other in the southern upper Rhine region, and a vein ore mine in the northern Black Forest.

The main emphasis of this project is on the prospecting and archaeological investigation of Celtic smelting places. Starting out from potential ore deposits and the known settlement pattern, the fields and forests around the potential areas have been searched for remains of archaeometallurgical activities, mainly slags. By means of detailed typological studies it was possible to