Bloomery Iron from Little Waltham, Chelmsford

D.O.E. Ref. 729545

Two irregular lumps of iron, heavily rusted, were received from this site for examination. Both the rust and the iron were strongly magnetic. On hammering, the rust fell away revealing good, dense, metal which was difficult to cut.

Pieces were cut from each of the lumps and mounted in the usual way. The structures were similar consisting of large equiaxed ferrite grains which were very difficult to etch in nital. It was clear that the metal had a high phosphorus content. Slag was relatively infrequent. It was present mainly in large masses and it was clear from its distribution that the metal had had little forging since it left the bloomery hearth.

High power examination showed no carbon and therefore we can say that this is less than 0.03%, if present. Hardness tests showed that one piece had a hardness of 197, and the other 188 HV5. In the absence of carbon this suggests a phosphorus content in the range 0.9-1.1%.

Conclusions

Both pieces consist of high phosphorus bloomery iron. They could have come from the same smelt or bloom. High phosphorus ores are common in England. Stamford[1] has yielded such ores; West Runton (Norfolk) ores and metal.[2] Nearer at hand we have the two pieces from Braintree.[3] One of these was very low in phosphorus, while the other had some phosphorus but not nearly as much as in the present samples. But the ores available in Britain vary in phosphorus content from nearly zero in the case of the Forest of Dean, S. Wales and Cumbria, to those in most areas which are capable of giving phosphorus contents up to 1% or so. The latter are very much in the majority.

4.3.77 R F Tylecote

References

1. R F Tylecote. Bull HMG. 1968, 2 (2), 83

2. R F Tylecote. Ibid. 1970, 4 (1), 24-27

3. R F Tylecote. Report to D.O.E. Am Lab dated 10th May, 1976.