Early Iron Age iron-smelting debris from Rwanda and Burundi, East Africa

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ABSTRACT: Iron smelting is attested from at least the first part of the 1st millennium BC in both West and East Africa. In both regions the earliest furnaces seem to have been the slag-pit type. In this study the slags and furnace remains from such a furnace have been studied. The clays used for the furnace structures and for the tuyères were not especially refractory. Fayalite and hercynite with some wüstite were the main phases present in the slags, with compositions suggesting either the deliberate addition of clay as a flux or a significant clay contribution from the refractories. Such slags are known from contemporary and more recent African smelting practice. The significant differences in the slag mineralogy were found to be due to quite minor differences in composition rather than real variations in the processes carried on at the various sites studied.

Introduction

This article continues the archaeological research into the Early Iron Age Urewe culture in Rwanda and Burundi (Figs 1a and 1b), in which one of us (M C Van G) has for a number of years proposed new insights regarding the chronology (Van Grunderbeek 1992), ceramics (Van Grunderbeek 1988), environment (Van Grunderbeek and Doutrelepont 1989), agriculture (Van Grunderbeek and Roche forthcoming), way of life, society, degradation of the environment as a consequence of human activity, and iron-smelting technology (Van Grunderbeek et al 1983 and 2001). The study of early iron smelting in the region continues with the survey etc of Jane Humphris, Institute of Archaeology, UCL, London. The subject of this paper is the iron-smelting technology, concentrating on scientific analysis and interpretation of the ores, slags and refractory materials from the furnaces.

The development of iron smelting south of the Sahara embodies some of the most significant questions in the whole of archaeometallurgy. The possibilities of an independent invention of iron smelting cannot be easily dismissed, and the range of smelting methods employed, many apparently unique to Africa, are of continuing interest (Desceudres et al 2001). The study is further enhanced by the strong ethnographic contribution. Traditional iron-smelting operations were still conducted in many parts of Africa until the recent past; some were recorded whilst still working and in others the former operatives have taken part in smelting replications, thereby adding another dimension to the interpretation of the archaeological remains of smelting generally (Herbert 1993; Schmidt 1997). There is a wealth of information concerning the more social and ritual aspects of the processes and on the gender, role and status of the smelters and smiths. These more ritualistic aspects are hinted at in some of the surviving early records from other parts of the world, but surprisingly little has been recorded from traditional smelting and other metallurgical operations outside Africa. This is especially true of South Asia where the many 19th- and early 20th-century descriptions of mining and smelting activities, mainly made by geologists, almost totally ignore the social and ritual aspects. Knowledge of the often elaborate symbolism and complex ritual recorded in Africa must give pause when interpreting prehistoric remains in a purely functional manner. Turning specifically to the iron-smelting remains of the Urewe culture in Rwanda and Burundi, it has to be stated that no