The Nigerian Field 70:118-124 (2005)

IRON-SMELTING IN NORTHERN NIGERIA

H.D.L. Corby

While touring in the Kontagora Emirate in 1938, I passed through the village of Madara, and was interested to see iron being smelted in the simple blast-furnace here described. The drawings are to scale from photographs taken at the time. However, as the furnace was working, dimensions of the furnace-chamber are estimates only.

The furnace-chamber itself (1) was a small pit, oval in cross-section, measuring about 65 cm from front to back and 40 cm from side to side at ground level (2) and tapering to a depth of perhaps 90 cm. Straddling the pit was a man-high clay wall (3), reinforced at the sides with built-in poles (4). This wall supported the bellows (7) and shielded the bellows-man from the heat of the furnace. Built into its base at one side was a pair of recesses (5) containing ten pebbles used as tallies—of these more anon. On the face of the wall were decorative mouldings (6), perhaps indicative of the sex attributable to an entity giving birth to iron.

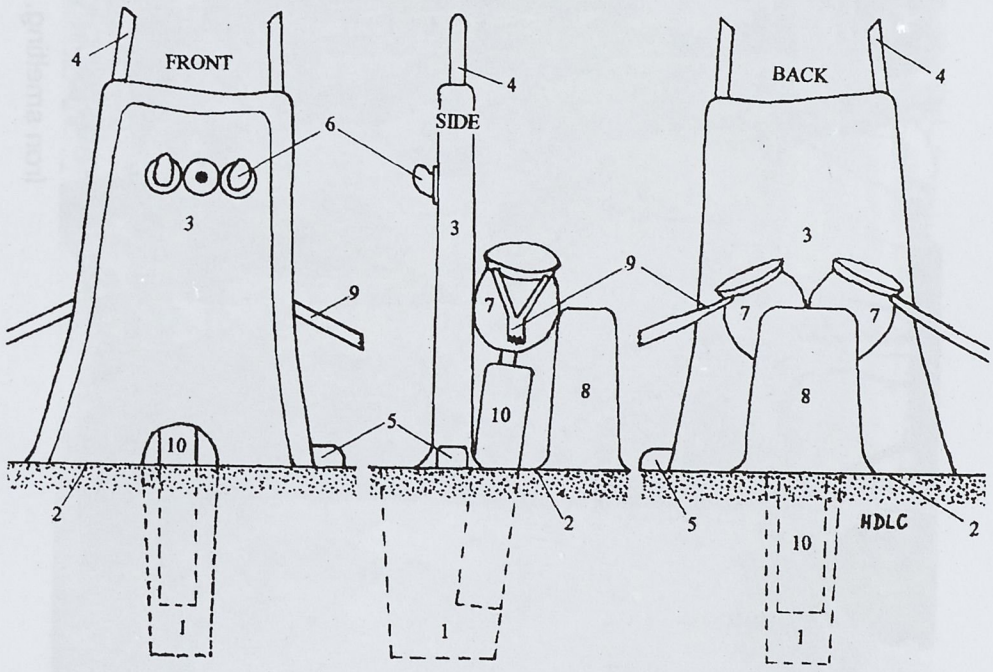
The blast was provided by a pair of bellows (7) consisting of two large earthenware pots, each with its mouth closed with a diaphragm of goatskin, and its base fitted with a spigot. As I recall, the diaphragm had a loop for the bellows-man's hand, and a valve-controlled air-inlet, with the valve having a looped thong for his thumb. The two bellows were operated by pumping the two diaphragms in opposite phase, with the thumbs controlling the two air-valves.

The bellows were held in place against the back of the wall by a bolster of clay (8) and two forked poles (9), with the lower end of each pole (not shown) being anchored to the ground with a heavy stone. The bolster also served as the bellows-man's seat. The blowpipe (10) was cemented into place in the furnace-chamber with clay, and the spigots of the two pots were cemented into its top, also with clay. (Blowpipes were made by moulding clay round a slender bundle of long grass stems; this would burn out during the subsequent firing to leave a clear bore.) The whole structure had a bare conical roof-frame over it; presumably the thatch had been removed for the dry season lest it ignite in the heat of the furnace.

In operation, the furnace was charged with a mixture of precisely measured amounts of ore and charcoal, and each time it was so charged one of the ten pebbles already mentioned was moved from one tally-recess to the other. When all ten pebbles had thus been transferred, the furnace was left to cool, and the pig of iron extracted.

Ore was said to be mined from a nearby ridge. In extensive travelling, this was the only instance of its kind that I came across. Presumably the industry was dying out in the face of imported ironware, and the ready availability of scrap-metal from old motor-vehicles, etc.

A few months after passing through Madara, for example, I saw metal-workers in Kano making excellent razors from the high-grade steel of the spokes of wire-spoked car-wheels.

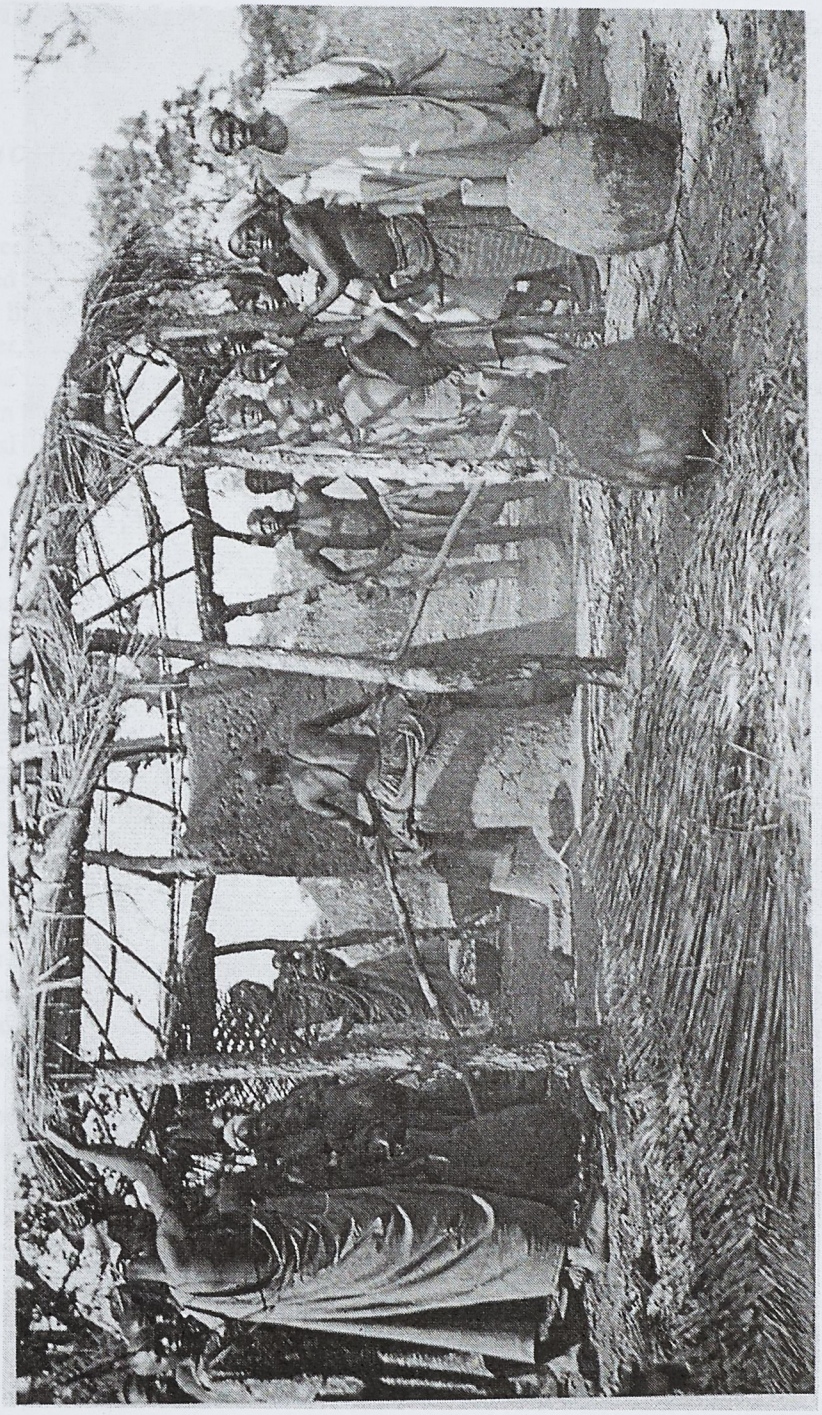


Iron-smelting blast furnace

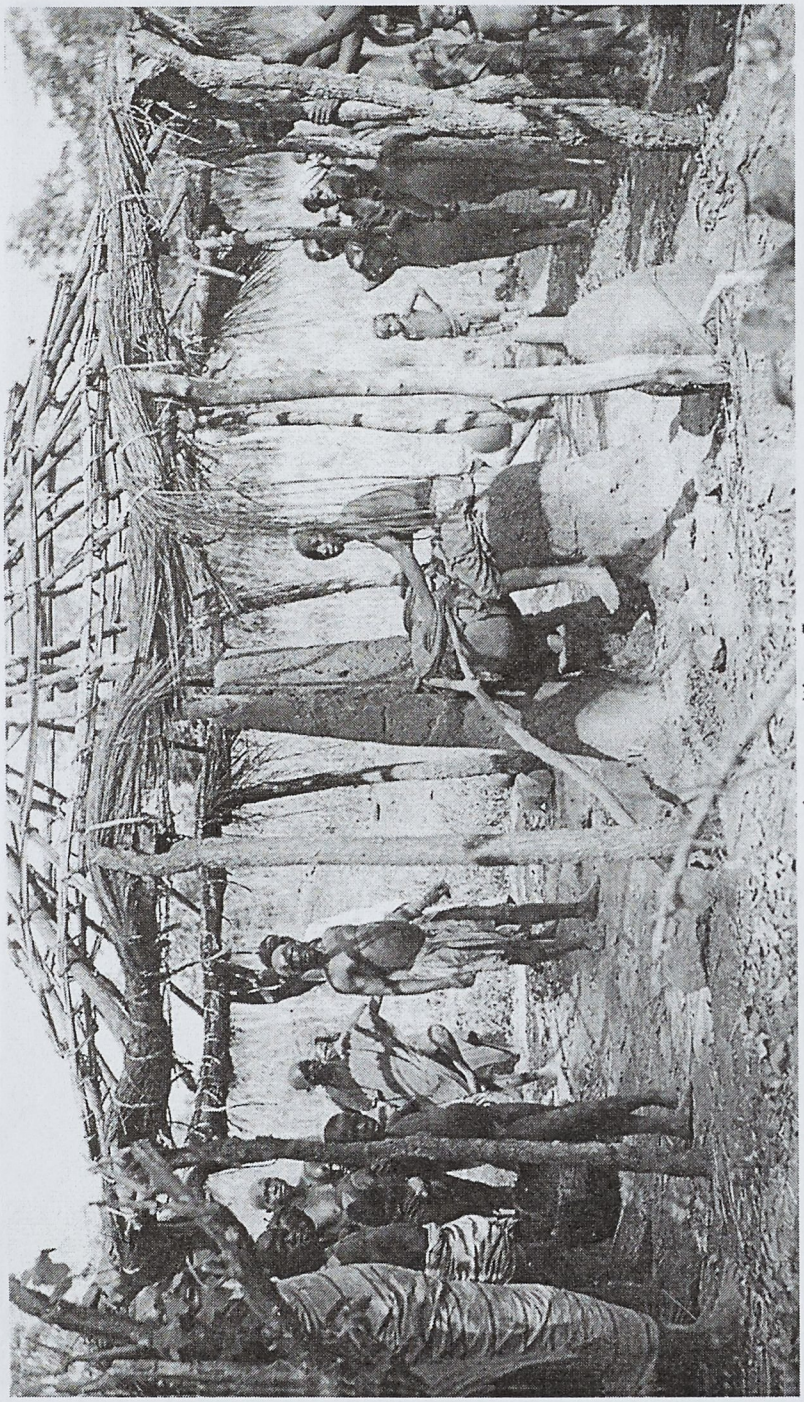
Iron smelting, 1

Iron smelting. 2

Iron smelting, 3



Iron smelting. 4



Iron smelting, 5