Dynamics of Metal Working Traditions in West Africa

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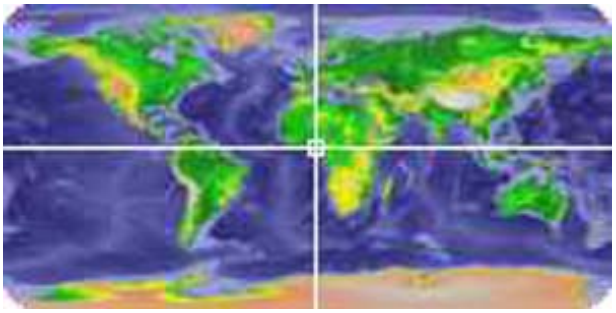

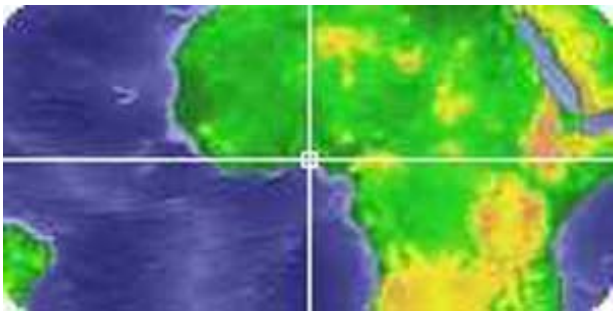

The development of metallurgy was a turning point in human history in West Africa. The use of metal tools allowed humans to have some control over their environment, and enabled them to transform their settlement patterns, political organizations, and modes of economic production and warfare. Researchers have often speculated that metallurgy techniques were developed earlier in other parts of Africa and the Mediterranean and then introduced through processes of diffusion from outside influences into the cultures of West Africa. West African skills of metal working – and particularly iron working -- were later transferred to locations in the Americas as a result of the trans-Atlantic slave trade. In this article, I provide evidence of early metallurgy developments within West Africa itself, as seen through a focus on the practice of metallurgy by the Nok culture of central Nigeria. Finally, as to better understand the importance of metallurgy, I discuss the potential discourse between West African archaeologists and those that study African diasporas.

Significance of Metal Working

Discussions on metallurgy within West Africa have primarily focused on contentions of when, where, and how the practice was introduced into the region by external forces. The

discussion below concerning the Nok valley of central Nigeria provides one line of evidence that iron working was developed independently within the region of West Africa. Studies focusing on the introduction of metal working into West Africa by external influences have also tended to downplay the ways in which metal working helped to transform the lives of the West African people. These transformations included changes in settlement patterns, political and kinship organizations, and modes of economic production and warfare.

Metal objects were also used by rulers of West African states for the expansion and defense of their various territories and kingdoms. For instance, according to Akinjogbin (2004) iron was a decisive war implement by Emperor Oduduwa to entrench his power over Yorubaland. In addition, there is substantial evidence that in various parts of West Africa such as Yorubaland, Kanuriland, Igboland (all in Nigeria) and Boboland (Burkina Faso) that metal objects were used for ritual purposes. For example, in Benin City different types of figurines were cast and put in royal ancestral shrines (Okpoko 1987). Iron not only impacted political and ideological orders, but also enhanced agricultural production, which ultimately led to rapid population growth in Yorubaland. In the sphere of agriculture, there was tremendous improvement with the use of metal implements. For example, cutlasses and hoes made of iron allowed for more effective cultivation of greater expanses of terrain.

The era of the trans-Atlantic slave trade witnessed the transfer of labour and technologies away from West Africa (Goucher 1990). African iron industries, like other spheres, were impacted by a decrease in skilled metal craftspeople within areas of West Africa. Finally, these impacts of European colonial and slavery regimes significantly constrained the growth and further advances of iron working technologies in West Africa due to local craftspeople having to compete with cheap imported iron from Europe.

Nok Metallurgy

Studies pertaining to the material culture of the Nok have emphasized the production of terracotta figures, while discussions of metallurgy have largely been absent from discussion of facets of Nok culture. However, there is abundant evidence that iron smelting and smithing were practiced in Nok around 900 B.C.E. Several tuyeres, elements of furnace equipment, and charcoal remains have been recovered from the Nok valley. This archaeological evidence

supports the probability of iron working activities in the Nok valley from the time of 900 B.C.E. to the present. Important archaeological sites in the Nok valley provide evidence of such early metallurgy practices, including Katsina Ala, Ankiring, Kagara Wamba, Tare, Zema, Samun Dukiya and Abuja.

The archaeological site of Taruga is situated in the centre of Nigeria and is located near the Takushara River, a tributary of the Niger (Fagg 1969). In Taruga, archaeologists uncovered ten iron smelting furnaces which were associated with iron slag, tuyeres and charcoal remains. Also recovered were a number of human figurines and iron objects (Fagg 1969; Fagg 1972; Okpoko 1987). The Taruga furnaces have been described by Tylecote (1975) as "thin walled mud shafts over shallow pits." According to Anozie (1979) the internal diameter of the furnaces varied between 30 centimeters and 100 centimeters. The height of a small furnace measured from the bottom of the pit was put at 1 meter. According to Fagg (1959), lumps of heat-treated soil have been found, which he attributes to furnaces and slabs of hard clay. These artifacts show impressions of cording which suggests that such materials may have been associated with wattle and daub construction materials. Iron materials recovered from sites associated with the Nok include iron axe blades, lip plugs, knife blades, fragments of arrows, spear heads, hooks, bracelets, and beads (Fagg 1969).

Different types of furnaces have been used in the smelting or reduction of iron in West Africa. Anozie (1979) described these as fitting in five general types: pit or bowl; Nupe forge; Taruga furnace; shaft or cylindrical; and the dome shape. The basic process of iron reduction is to ensure that smelting or reduction of iron takes place at a temperature of about 700 degree centigrade. In the shaft or bowl furnace, as well as the dome furnace, iron is in contact or mixed with charcoal. The charcoal burns and combines with oxygen from the air to form carbon monoxide (Anozie 1979). The hot carbon monoxide passes through the furnace and reacts with the iron oxide by removing (reducing) deposited iron (Andah 1979). The smith later consolidates this mass of iron particles by heating and hammering them together. Of these furnaces, the origin of the Nupe forge is unknown, even though it was still found not long ago in the lower reaches of the Niger (Anozie 1979). The Taruga furnaces according to Tylecote (1974) have characteristics similar to those of some parts of sub-Saharan Africa. The dome type of furnaces was probably indigenous to West Africa. Contentions by scholars that these furnaces

were introduced into West Africa by outside influences are unconvincing. Iron working had been present in West Africa earlier than 146 B.C.E., which was claimed to be the period of the introduction of this type of furnace to West Africa from external sources. Similarly, there is no persuasive evidence to support the notion that shaft furnace was introduced by external sources.

From the Taruga site, radio carbon dates of the iron furnaces have yielded a range from 920 B.C.E. (+/- 50) for sample Y-474; 300 B.C.E. (+/- 100) for sample 1-3400; 440 B.C.E. (+/- 140) for sample 1-2960; and 280 B.C.E. (+/- 120) for sample 1-1459 (Willet 1971: 12). These dates indicate that Nok culture preceded iron working at Jene Jeno (2nd century B.C.E.), Daima (5th Century C.E.), Matara (Ethiopia 5th century B.C.E.), and Meroe (5th century B.C.E.). These sites show that there was intensive iron working in West Africa with each group probably devising its own techniques and methods to suit the resources available within the local environment. Such resources include the types of ore, kinds of wood for fuel, and local craftsmanship (Anozie 1979). Based on the early dates for iron working in West Africa, it is improbable that iron working traditions were first introduced to West Africa from external influences. The dates for Nok culture and the other mentioned dates for other early occurrences of iron working in the broad Sudanic zone are too close in time with the dates for Carthaginian and Meroitic "iron age beginnings" for us to safely envisage transmission of ideas from these northern sources to other places so far away (Andah 1979).

This contention of indigenous development of iron working technologies in West Africa stands in opposition to earlier "diffusion" accounts. For example, Davies (1967) argued that iron was discovered after many centuries of the use of copper and bronze. According to him, the knowledge of iron smelting is a very complicated one, and smelting was at least partly worked out in Eastern Anatolia around 1,500 B.C.E. The knowledge of iron working diffused through the Near East and Europe with the weakening of the Hittite state. He further argues that the knowledge was brought to West Africa across the Sahara from the Maghreb. Confronted with evidence at Ntereso in Ghana, Davies asserted that a limited knowledge of iron working may have reached parts of West Africa quite early (Davies 1967; Willet 1971).

Based on the relationship between furnace types of tropical Africa and Mediterranean antiquity, Williams (1969) contended that iron working traditions could have been introduced to

West Africa from both North and Northeast Africa. According to him, the "meroitic" shaft furnace type originated in the area of modern-day Spain, and was introduced to West Africa by Arabs (Williams 1969 in Andah 1979). Mauny (1952) and Tylecote (1974) based their own arguments on evidence concerning trade and exchange. They contend that iron working peoples interested in trade began to establish themselves on the coast of North Africa early in the first millennium B.C.E. onwards, introduced iron working into the Western Sudan through trade or war and across the Sahara especially through the Garamantes of Libya.

While assessing the evidence from Nok cultures, Tylecote (1975) suggested that the most likely influence in West Africa seemed to be Carthage. Carthage was founded at about the end of ninth century B.C.E. by the Phoenicians who had already established settlements on the Mediterranean coast of Africa as early as about 1100 B.C.E. The Phoenicians came from an area where iron was widely used earlier than Egypt. Iron objects started appearing in their tombs from the sixth century B.C.E. and by the third century B.C.E. Carthage had become an important iron working and trading centre. Carthagian influence became strong on the North African coast along the gulf of Gabes, inland of which was located the powerful culture of the Garamantes. The Cathagians undertook explorations along the coast west of the Gilbraltar strait. It has been thought that it was through these contacts with the Carthagians that ironworking techniques gradually spread across the Sahara to centres in West Africa (Mauny, 1952; Shaw 1969 in Jemkur 2004). In Tylecote's view, one cannot accept the possibility of independent development for iron working traditions in Nok (Nigeria), because West Africa had no pyro-metallurgical traditions.

Such diffusion theories are predicated on the belief that there was a core culture area (e.g., the Near East or Anatolia) and that technological knowledge spread from that core to other surrounding areas through trade, exchange, warfare, and colonial expansions (Adekola 1995). There are several obvious shortfalls with this theory, which is undermined by a number of evidentiary gaps and contradictory data (Bocoum, 2004; Jemkur, 2004). In addition, researchers such as Andah (1979) have argued that iron ore smelting does not require very high temperatures (1100 degree centigrade to 1300 degree centigrade) and that therefore iron technology may have developed directly from pottery firing techniques. Moreover, available site dates in sub-Sahara Africa are earlier than those of places regarded as the diffusion donor areas.

Contemporary Challenges and Potentials Facing Research in Metal Working

There is the need for more research in West Africa to further elucidate the past dynamics of iron working activities in the region. Road construction, building, mining, farming, infrastructure development, and treasure hunting have destroyed many of the iron cultural heritage sites. For a better picture of the iron working history in Nigeria and other parts of West Africa to emerge, holistic studies of identified sites are necessary (Aremu 2001). Yet, a lack of government and private funding has limited our ability to continue our studies. This inability has tremendous consequences, not only for research of metallurgy in Nigeria, but for all archaeologies pertaining to African diasporas. For example, there is currently no single university in Nigeria with a radiocarbon dating facility, and most specimens for dating must be sent to laboratory facilities overseas. In the light of recent research in West Africa, it is obvious that there were deficiencies in the data used to bolster the diffusion theory. Based on such evidences as dating, types of furnaces, as well as processes of manufacturing of metal objects, metal working in West Africa now appears to have been an indigenous development in the region.

In order to better contextualize groups that were a part of diasporas, archaeologists must better understand the dynamic societies that were sources for the captive labourers transported to the Americas. Through understanding the important role of metallurgy for people in West Africa, and the deep histories of those technologies among cultures dating back to the Nok, archaeologists can enhance their interpretations of cultural knowledge and traditions within regions of Africa and African diaspora sites.

Note

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