ARCHAEOLOGY OF AFRICAN PLANT USE

EDITED BY
CHRIS J. STEVENS, SAM NIXON, MARY ANNE MURRAY
AND DORIAN Q FULLER

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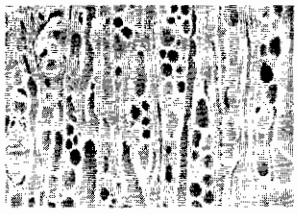

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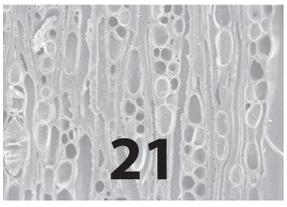

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African Agricultural Tools

Implications of Synchronic Ethnography for Agrarian History

Roger Blench

Although the last few years have seen considerable advances in African archaeobotany, so that we now have a broader picture of the evolution of African agriculture from the point of view of crops, our understanding of the techniques informing that agriculture remains poor. Although Africa has a rich diversity of agricultural tools, they are known principally from synchronic descriptions rather than excavation.

A certain urgency is suggested by the rapid erosion of traditional tool production and use. Animal traction and tractors are replacing hand tools in some areas, but probably more significant is the replacement of implements made locally by blacksmiths with standardised factory-made tools. This replacement can follow from aid projects but is also often a consequence of social disruption and war. Once NGOs and international agencies get into the business of resupplying communities following civil society they do not often enquire closely into traditional implements but supply those easily available from industrial sources. There is also a noticeable difference between the ethnographic tools illustrated in early monographs or taken from 19th- and early-20th century collections and those in use today, even if they have been made by 'traditional' blacksmiths. The growth of the nation-state, with improved long-distance trade, agricultural schools, and development projects, has tended to make the tools more uniform over much greater areas. The availability of scrap iron and improved blacksmithing techniques have made possible greater specialisation and economies of scale, and this is affecting tool repertoires.

Despite these changes, the majority of African farmers probably still use some traditional tools and have them repaired by village blacksmiths, so that evidence can be recovered for their names, construction, and use. However, this information has remained a poorly exploited source of data for archaeologists and prehistorians. This chapter is a preliminary survey of the tools in use, their classification, and the hypotheses that can be suggested concerning their evolution and development. In assessing whether African tools are essentially indigenous or have spread from outside the region, it is useful to have comprehensive comparative materials. Unfortunately, these are also sparse. Roman implements been well covered in White (1967, 1975), and Stuhlmann (1912) is a valuable guide to the Maghreb, but many questions posed by speculations in this chapter have no immediate answers.

The definition of African tools can also be rather fluid; almost anything can be developed into a hoe or an earth-shaping tool. Dupré (2000) illustrates this point with the agricultural knife of the Congo, which at one extreme resembles the bush-cutting knife but in some examples develops a wide blade that can also be used for planting and uprooting. She calls this agricultural knife an *outil polyvalent*, which seems appropriate. A similar case is digging sticks; those on the edge of the Sahara have gradually developed extra wide blades and now often resemble long-handled hoes. Thus it is always helpful to investigate tools in use, rather than to assume that their function can be deduced from their morphology.

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A perplexing problem in describing agricultural tools is that many African types have no standardised name. French scholars, who have been more active in this area of research, have devised a number of terms, often by reexcavating old rural names, but these have yet to be adapted into English. Wigboldus (2000), attempting to describe the wooden spade-like tool used in the Sahel, proposed the term 'long-handed scuffle' but later admitted defeat and returned to *iler*, a regional term. Nonetheless, this seems unsatisfactory; this chapter makes some further efforts to introduce descriptive terms for African tools.

Three Phases of the Availability of Iron

Although agricultural tools can clearly also be made of stone and wood, there is little doubt that African agriculture was transformed by the production of iron and that this development led to a major diversification of tool morphology. Unlike the Mediterranean world, in Africa copper was widely smelted contemporaneously with iron, but copper seems never to have been used for tools and only occasionally for weapons (Cornevin 1993). The only exception is in the subdesertic regions, especially Mauritania, where a widespread industry existed from ca. 2000 B.C.E., using both native copper and later copper alloys. Lambert (1983, pp. 79–80) illustrates a number of copper implements (with arsenic) that she describes as *haches*. The illustrations are not clear enough to allow us to be sure, but some of the triangular blades with truncated tops could be hoe blades. The method of fixing these blades to a handle is uncertain. The great majority of tools in these Mauritanian finds are weapons, arrow and spear tips, so if there was an excursion from copper into agricultural tools it made almost no impact on sub-Saharan Africa.

Iron became available in three significantly different phases, and this scale of availability has had different effects on the types and numbers of tools created by blacksmiths. These phases can be delineated as follows: first, the introduction of iron smelting on a small scale (ca. 500 B.C.E.); second, the increase in the availability of iron with the import of pig-iron from the 16th century onward; third, the availability of iron on a large scale (ca.1950 C.E. onward) through access to scrap iron from discarded industrial products. Needless to say, the spread of iron was geographically determined, and the more remote an area, the longer it took for the effect of cheaper iron to take effect. For example, iron began to be traded from the coast in the 16th century, but it was not until the 1930s that it competed effectively with locally smelted iron in the interior, causing smelting industries to decline and eventually disappear. This process of elimination is now virtually complete, but in an extremely remote area in southwest Ethiopia, smelting still competes with imported scrap, because the nearest road is still a week away on horseback, making transport costs very high (Haaland 2004). A fourth phase could also be suggested—the purchase of finished iron products from European industries. It seems that the first item in this category to be imported was the cutlass, or *panga*. Other imported iron tools were the ploughshare, the harrow, and in more recent times, spades, shovels, rakes, and various types of hoe blade. The significance of these has been highly variable according to how useful farmers perceive them to be. Imports appear to have been much more influential in eastern and southern Africa than in West Africa.

Ethnographic and Archaeological Evidence for Tools

The use of material culture from the recent past is still a store of information largely unexploited by archaeologists. It is sometimes thought that ethnoarchaeology covers this entire field, but, in fact, the emphasis on pottery and house-forms has been pursued to the near exclusion of all other types of evidence (Blench 2006). Indeed, the mapping of existing African agricultural tools and their associated terminology is still in its infancy. There are, however, a variety of ethnological descriptions and overviews that are useful background material. The German ethnologists took considerable interest in this topic: Baumann (1944) published a very detailed description of the morphology and distribution of African farmers' tools. Two edited volumes in French provide rich material as yet unmined by archaeologists: Seignobos (1984); Seignobos, Marzouk, and Sigaut (2000). The latter material has the classic problem of Francophone publications—their tendency to halt at linguistic boundaries. Papers use 'Northern Cameroun' as a unit of analysis, even though there is no evidence that such a boundary is relevant to the tools under discussion. Like so much in the field of material culture, documentation is urgently required, because there is a significant process of homogenisation at work, even where blacksmiths are still making tools. Descriptions of tools are scattered in hard-to-obtain monographs, such as Coulibaly (1978) for the Senufo in Cote d'Ivoire and Mudindaambi (1976) for the Mbala in DRC. Seignobos (2000) documents this process in Northern Cameroun, where a relatively few tool types are becoming dominant, and the variety that he illustrates is gradually disappearing. Throughout the continent, factory-made tools and tractors are replacing traditional cultivation techniques.

A striking feature of African agricultural tools is the comparative rarity of preexisting models in other materials. Although agriculture clearly preceded iron, we have only a sketchy idea of what tools were in use before the introduction of iron. It is possible to make a wooden hoe blade for use in light, sandy soils, but whether wooden hoes preceded iron ones is doubtful. Although stone sickles for cutting grass existed as far back as 10,000 B.C.E. in West Africa (Shaw and Daniels 1984), these were not the precursors of the iron sickle of the present Sahel, which is a late trans-Saharan introduction. But it seems doubtful that many of the techniques characteristic of African agriculture could be pursued without iron tools—for example, the raising of large furrows and yam mounds. A case where it is possible to see something of this limited pre-iron repertoire is Fernando Po. This island was settled by a Stone Age Bantu group, the Bubi, some 3,000–4,000 years ago. Although the Gabonese Fang people reached the island prior to European contact (supposedly 800 years ago), they brought little iron, with the result that most Bubi were still using lithic technology when Europeans first made contact (Tessmann 1922).

The Early Rarity of Iron and Its Value

Iron produced by smelting is a lengthy process, and, particularly when smelting was first introduced, iron was presumably rare and costly. One of the consequences of this was that the metal was constantly reused. Hoe blades would have been forged over and over again, and when the blade became too fragile, its pieces would have been made into ornaments and other items unrelated to tools. As a consequence, remnants of agricultural tools are rarely found in early sites, even where furnace remains show that iron must have been produced in quantity. As skills developed, iron production was gradually on a larger and larger scale, leading to sub-industrial sites. One of the more well-known sites is Meröe in Upper Egypt, from the last centuries B.C.E. and early centuries C.E. (Cornevin 1993, p. 141; see Fuller, Chapter 14 this volume). Somewhat later is the Igbo site of Leja, which although it has dates as early as 200 cal B.C.E., probably began high volume production in the 15th and 16th centuries, where most dates are clustered (Okafor 1993, p. 438). Sukur, in the Mandara mountains of Northern Nigeria, probably became a major producer in the 17th century (David 1996, p. 598). Nonetheless, until the immediate precolonial period, iron remained a rarity in many remote societies and is difficult to trace in the history of tools.

Figure 21.1 'Marriage' hoe from the Mandara mountains (drawn from author's photo).

The value of iron in the era of smelting and its use in agriculture soon became related to iron's use in currency systems. Although there is some evidence for the use of copper in trade, notably the Katanga crosses, iron was probably more important as a local currency. The most well-known example of this use is the 'Kissi penny' or *guinzé*, a long, thin strip of iron with a flattened end used in exchanges in a zone between the Liberian coast and Southern Guinea at the end of the 19th century (Béavogui 2000). The exact antiquity of this device is hard to gauge, since it probably reflects the abundance of iron following post-European imports. Hoe blades were frequently used in currency-like contexts, such as bride-price payments, throughout much of West Africa. However, as the culture of ritual exchange developed, and as the total amount of iron in circulation gradually increased, ritual blades became morphologically transformed until they were no longer useful as hoes but functioned only within the context of exchange. The Mandara mountains in Northern Cameroun are particularly notably for the wide range of hoe-like objects (see Seignobos 2000) manufactured and circulated (Figure 21.1).

Hoe Culture and the Division of Labour

Agricultural tools do not exist in a sociological vacuum; farm labour in Africa has always been strongly divided along gender lines, and this situation is frequently reflected in the tools themselves. The discussion about the division of labour was taken up in detail by Baumann (1928) and later Goody (1976). Broadly speaking, men tend to do the 'heavy lifting', clearing the bush and raising large furrows and yam heaps, while women tend kitchen gardens and carry out secondary tasks such as weeding. In early

versions of this argument, hoe culture was connected to 'matriarchy' [matriliny in modern terms], but whether such correlations are useful can be debated. There are many variations on this pattern, from some of the extreme societies in the Senegambian region where women carry out virtually all agricultural tasks to societies where women are not allowed on the farm. The advent of a puritanical Islam has also effected a significant transformation in parts of West Africa, where men have increasingly taken over all farming tasks, considering that to expose women outdoors contravenes Islam. The consequence of this division is that many societies have 'men's' and 'women's' tools. The focus of this chapter is on the gross morphology of tools, which often does not reflect this difference, but typically men's hoes and axes have different shapes and weights and may be adapted to slightly different tasks.

LINGUISTIC EVIDENCE

Despite the importance of African agricultural tools, historical linguists have so far ventured very few reconstructions (see also Ehret, Chapter 21 this volume). Table 21.1 (see also Figure 21.2) shows all the proto-forms in the Bantu language groups relating to agricultural practices and tools. The complex of terms around farming and cultivation, attested in A and B groups/zones close to the Bantu homeland, argues fairly convincingly that the proto-Bantu had some form of agriculture (see also Bostoen, Ehret this volume). There is an overlap of words for 'hoe', 'axe', and razor', especially partway through the Bantu expansion (group/zone C onward). This overlap probably corresponds to the period of the introduction of iron tools, some 2,500 years ago. Initially, they would have been rare and expensive, and there would have been a tendency to call them by the name of their material, leading to a polysemy that is uncommon in the present.

Another important study is that by Tourneux (1984) of the names of agricultural implements in Northern Cameroun. Although the languages he considers are quite closely related, the vernacular terms are very diverse, making it difficult to extract useful historical information. Two lessons can be learned from this: linguistic sources are often not very accurate in terms of descriptions of material culture, and there is considerable shifting of terms from one implement to another.

Table 21.1 Bantu Reconstructions Indicating Agriculture (zones are shown in Figure 21.2)

Root	Gloss	*Form	Zones	Regions
I	hoe, axe	bàgò	A J P	NW NE SE
		bògà	A B	NW
II	hoe	cúkà	C F G J L M S	NW C NE SE
		kácù	D K L M	NC
		púkà	A J	NW, NC
III	cultivate (especially with hoe)	dìm	B C E F G J K L M N P R S	Throughout
	cultivated field	dìmì	J L M	NC
	field sp.	dìmìdò	J	NC
	cultivated field	dìma	J S	NC
	field sp.	dìmé	J L M	NC
	farmer	dìmì	J L	NC
	work	dìmò	C F G H J K L M N S	Throughout
IV	hoe; axe; spear-head; knife	gèmbè	C D E F G J M P	NW C NE SE
	shave; cut hair	gèmb	J	NC
	razor	gèmbè	D F J L	NE
	axe; hoe	dèmbè	S	SE
	axe; hoe	jèmbè	E G L M N S	NE C SE

Source: Bantu Lexical Reconstructions, 3rd ed. (BLR3) maintained by the Musée Royale de l'Afrique Centrale (MRAC), http://linguistics.africamuseum.be/BLR3.html.

Figure 21.2 Map of Bantu zones defined by Guthrie. **Bold** letters mark Guthrie/Tervuren zones (see also Table 21.1), and numbers mark subgroups within those zones.

DIGGING STICKS AND PLANTERS

DIGGING STICK

The simplest tool still in use in agriculture is the digging stick. In its most rudimentary form, it is a stick with a pointed end, used for making holes in which seeds can be dropped. More complex sticks have iron tips, and these can gradually widen and flatten out until they resemble long-handled hoes, used for more sophisticated earth manipulation. Some digging sticks still in use in the 20th century had perforated stone weights on the top of the stick to increase the penetration of the pointed end. Such implements are recorded from Ethiopia (Gascon 1977). Such perforated ring-stones have been recorded from a number of archaeological sites in Africa. Digging-ticks are pre-agricultural, used, for example, by foragers

Figure 21.3 Wooden digging stick from Fernando Po (after Tessmann 1922).

to dig out yams. Vincent (1985) records the Hadza of Central Tanzania digging for tubers with sharp, pointed sticks. However, the Hadza use decidedly modern cutlasses to sharpen the stick as they dig, so this practice cannot be a model for the pre-Neolithic. The Bubi of Fernando Po still used an all-wooden digging stick in the 1920s when Tessmann (1922) visited them (Figure 21.3).

PLANTER

Across the Sahel, pointed wooden sticks with iron tips are used as planters, especially in flood-retreat cultivation (Figure 21.4; for example, Raynaut 1984). This system is described for Senegal by Lericollais and Schmitz (1984, p. 440). Wente-Lukas (1977, p. 92) illustrates planters from Northern Cameroun with angled handles like that of a walking cane. These are likely to be ancient forms, perhaps coincident with the beginnings of agriculture.

ARROWHEAD DIGGING STICK

A development of the digging stick is a long handle with an arrow-headed tip, used on the southern margins of the desert in West Africa. Some examples are entirely made of iron (Figure 21.5), which is presumably a recent development. They are suitable for turning soil in sandy environments. It seems most likely they are an introduction from the medieval period, although there is no direct evidence to support this.

HOES

The most widespread and significant African agricultural implement is the hoe. A small number of African hoes have wooden blades, and there is debatable evidence for copper blades in archaeological contexts in West Africa, but hoes with iron blades predominate. Iron-bladed hoes can be subcategorised according to the method of fixing the blade. The principal types are bound hoes, transpierced hoes, gripped hoes, and socketed hoes (Figure 21.6; Figure 21.7). A fifth

Figure 21.4 Hausa planter in Maradi, Niger (drawn from Raynaut 1984).

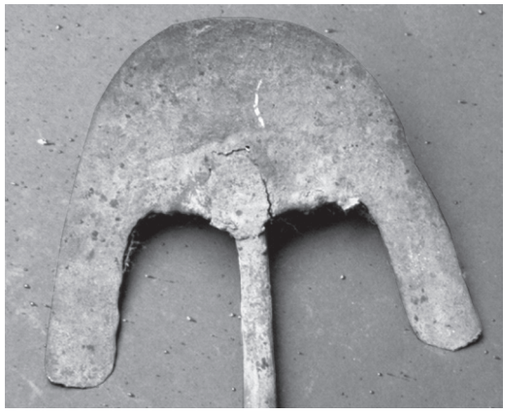

Figure 21.5 Head of Tamashek arrowhead digging stick, Mali (courtesy of the author).

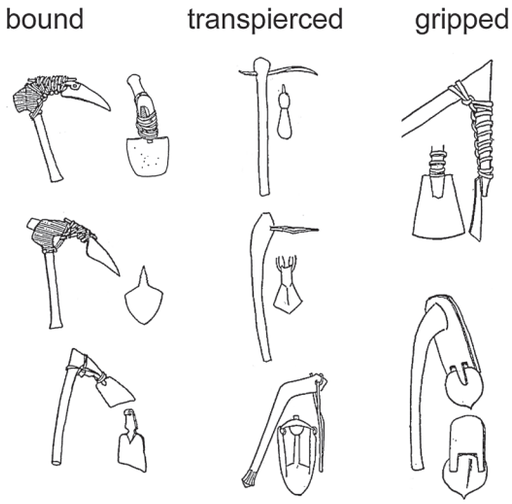

Figure 21.6 Comparison of hoes with iron blades: bound (after Seignobos 2000), transpierced, and gripped types (after Baumann 1944).

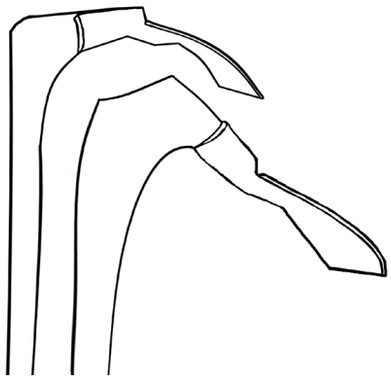

Figure 21.7 Socketed hoes, Burkina Faso (drawn from author's photo).

type of hoe, where a straight handle passes through a ring soldered to the top end of the hoe blade, is characteristic of most European hoe designs and is the common type imported into Africa. Such hoes have been recorded traditionally from Morocco and down the Nile as far as Sennar. Recent industrial hoes are of this type and can be seen in recent descriptions of African tools (for example, FIDA 1999) but are never illustrated in older ethnographic texts.

Wooden Hoes

Baumann (1944, p.207) illustrates a number of wooden hoe types from across Africa (Figure 21.8; see also Arkell 1937a). Baumann's map (p. 208) shows a strip across the continent from Senegambia to Southern Ethiopia. A wooden hoe will function only in soil that is relatively light and without too many stones. Otherwise the blade will break extremely quickly. Morphologically, there seems to be little unity between these implements, and it is not unlikely that they are not precursors of the iron hoe but rather back-formations—that is, copies in wood of iron implements. Some indeed have iron tips and may simply be designs to save on iron. Some also fall within the next category 'bound hoes'.

Bound Hoes

Earlier sources for African agricultural implements illustrate a wide variety of bound hoes (Fr. *houe à surliure*) (Baumann 1944; Seignobos 2000; Figure 21.6), where the blade is simply attached to the handle by a cord. Meek's account of Mambila hoes makes this point: "They had no hoes and carried out their operations by means of digging sticks. When they first obtained the iron hoe head they used it without affixing a handle. At the present time the hoe head is fixed to the iron handle by the primitive method of binding with palm-fibre" (Meek 1931, Vol. 1, p. 562).

Personal observation in the 1980s suggests that this type of hoe had been completely replaced by 'modern' hoes from Nigeria, where the tang transpierces the handle. Technically, this method is highly inefficient as the impact of the hoe against the ground will loosen the binding very rapidly. The fact that so many survived into the ethnographic era underlines the point that iron was expensive until very recently and widespread access to iron hoes relatively new.

Transpierced Hoes

Transpierced hoes have a metal tang that projects from the blade and passes through the wooden handle (Figure 21.5; Figure 21.9). This is probably the simplest method of fixing a metal blade, but it seems to have no wooden analogue, since the first blow against the earth would probably split the wood. Archaeological evidence for this type of hoe is quite abundant—for example, from Iron Age Zambia (Figure 21.10). Lancaster (1975) reported similar hoes traded long distances in recent times.

Gripped Hoes

The gripped hoe is widespread but like the bound hoe seems to have a highly diverse morphology. Baumann (1944) illustrates a number of types distributed from Ghana to Chad and parts of the Congo (see Figure 21.5), and Seignobos (2000) shows that these are particularly

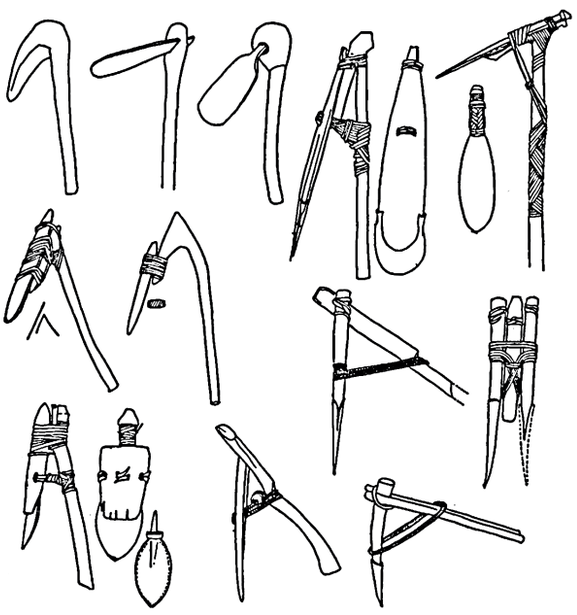

Figure 21.8 African hoes with wooden blades (after Baumann 1944).

Figure 21.9 Transpierced hoe, Supyire, Southeast Mali (courtesy of the author).

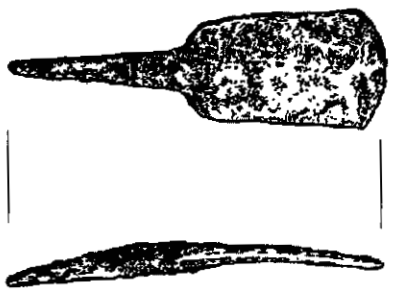

Figure 21.10 Archaeological hoe blade from Kumadzulo, Zambia, 6th-century site C.E. (after Vogel 1973).

diverse in Northern Cameroun. In some cases gripping can be combined with binding, but the principle is that the blade is gripped between wooden projections on the handle. The advantage of this construction method is that the hoe need use only a very small iron tip, with most of the blade made of wood. The disadvantage is that the iron piece probably comes loose with some regularity. Like the bound hoe, the gripped hoe may not represent a stable morphological type but rather a transition to the transpierced and socketed types.

Socketed Hoes

Another very characteristic type is the socketed hoe, found almost throughout the continent. Instead of piercing the handle with a tang, the blade is folded into a tube and usually fitted to a naturally bent handle (Figure 21.7). Socketed hoes require more iron than the other types do but are probably more stable in use. Eggert and associates (2006, Figure 4) illustrate a decorated hoe blade from the site of Akonétyé in Southern Cameroun dated to 130–420 C.E. On this site, see also Kahlheber, Höhn, and Neumann, Chapter 10 this volume; they remark that the socketed design is unusual for Central Africa, but socketed hoes are common in West Africa. They also suggest that the thin blade may imply that it was manufactured for ritual purposes rather than everyday use. However, it may also simply reflect the scarcity of iron at this early date.

Knives, Cutlasses

Knives

Knives appear to be very old in African culture, and cane knives probably preceded iron types. An old root for 'knife' can be identified in Niger-Congo languages (Table 21.2). Cognates between Benue-Congo and Kru suggest an ancestral node that must be 6,000–7,000 years old at a minimum, older than the introduction of

Table 21.2 A Root for 'Knife' in Niger-Congo Languages

#-gbeN	knife		
Group	Language	Attestation	Comment
Kru	Aizi	bɛ	
	Bete	gblɛ̀	
Yoruboid	Igala	obe	
Edoid	Bini	ábɛ́è	
Igboid	Ekpeye	ògè	? loan from Ogoni. cf. Kana gɛè
Akpes	Daja	oyùŋgbà	
Nupoid	Nupe	ebì	
Oko	Magongo	igbegbẽ	
Idomoid	Idoma	àgbàgá	
Plateau	Tyap	abaai	
	Shall	nbaa	
	Jijili	obã	
Cross River	E. Ogbia	ɔ̀-gyɛ̀	pl. è-
Dakoid	Dõ	gbaa	
Mambiloid	Camba	bu	
	Somyev	bi	
	Len	mbètɛ́	
Bantu	PEG	*-bé`	

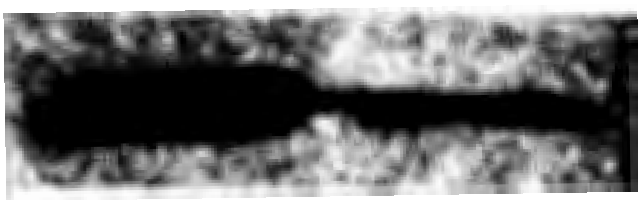

Figure 21.11 Agricultural knife from the Dogon, Mali (courtesy of the author).

iron. There is no proof that such knives were used only for agriculture proper; it is likely that they would have been adapted to a wide variety of purposes. Excavations in Akonétyé, Southern Cameroun, have recovered the earliest iron knife so far recorded in sub-Saharan Africa, dated 130–420 C.E. (Eggert et al. 2006). However, African knives quite closely resemble curved sickles and may have evolved in form as the sickle spread in West Africa (for example, Figure 21.11). Wente-Lukas (1977, p. 100) illustrates two types of harvest knife used by the Bana people in Northern Cameroun, which are straight-bladed knives rather than true sickles.

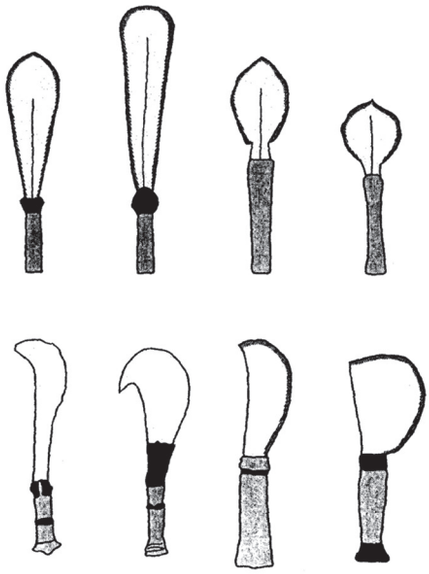

Figure 21.12 Selected variations of the cultivating knife (after Dupré 2000).

Cultivating Knife

An intriguing and little-known implement from West-Central Africa is the cultivating knife (*couteau de culture*) described and illustrated by Dupré (2000); a variety are reproduced in Figure 21.12. These are knives with either asymmetrical blades adapted for cutting or symmetrical, leaf-shaped blades, similar to a trowel, also used in planting operations. Dupré (2000) reports a distribution in eastern Gabon, Congo, and upper Sanga, but to judge by an illustration in Seignobos (2000, Figure 6) these knives are found as far north as the Cameroun Grassfields.

Cutlass

The African cutlass, matchet or *panga*, is essentially a large knife used for cutting undergrowth and woody stems as part of general ground clearance. This is not a typically European tool, so it was presumably designed as an improved version of an existing African tool, most likely the cultivating knife. Perhaps it was remodelled in Europe in the 19th century and reexported to Africa. Since it has a 'new' name in most places, it is likely that the category was unfamiliar to most buyers. It is employed virtually continent-wide as an implement and is often used to symbolise African culture.

Banana-Cutter

In regions where bananas are a staple, such as Uganda, a variant of the knife is used to cut down bunches of bananas (FIDA 1999). This knife has a curved blade attached to a forked stick (Figure 21.13). It is not clear whether this implement is widespread.

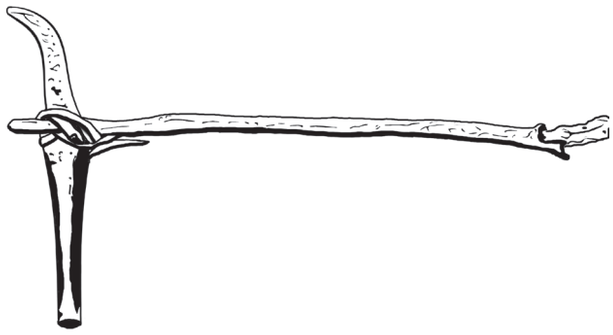

Figure 21.13 Banana-cutter, Uganda (redrawn from photo from FIDA 1999).

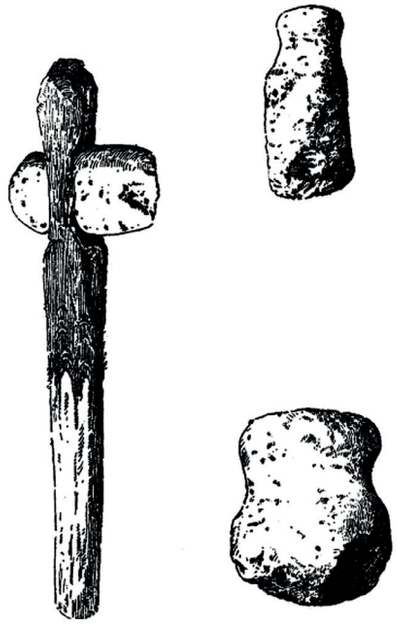

Figure 21.14 Hafted stone axes of the Bubi (Fernando Po) from the 1920s (from Tessmann 1922).

Axes

Hafted Stone Axes

Stone axes are a common lithic artefact described in pre-iron age archaeology, but the evidence for their contexts of use remains slight. Widstrand (1958, p. 88) points out that the axe features in many 'civilising hero' myths, often to the exclusion of other tools. Whether these narratives date from the pre-iron period is unclear, but they point to the early role of axes in chopping away vegetation for farming. Waisted stones axes are found widely across much of

Africa and survived into historic times on the island of Fernando Po because of the island's isolation from the mainland (Figure 21.14; Tessmann 1922).

Iron Axes

Axes with iron blades occur almost throughout the continent. Widstrand (1958) is a comprehensive survey of axe types, including tools, weapons, and ceremonial axes. Most societies recognise a distinction between adzes and axes; and adze has the cutting edge transverse to the handle, while in an axe the blade is parallel with the shaft. Adzes are used principally for woodcarving and are not treated here. Axes are used in many societies as much for warfare as for cutting wood, and for this reason they are not usually covered in synthesising sources such as Baumann (1944) and Seignobos (2000). The two main types are the transpierced axe (which Widstrand calls the 'slot-shafted' axe) and the socketed axe (Figure 21.15). Widstrand (1958) shows that transpierced axes are found from Senegambia to Zululand, with some records on the Nile in the Maghreb. Socketed axes are more limited and occur from Senegambia across to the Horn of Africa, with a small island of occurrences in Angola, but are otherwise absent from eastern and southern Africa. Akonétye in Southern Cameroun produced an axe blade (ca. 130–420 C.E.), but it is unclear how it was hafted (Eggert et al. 2006).

A third axe-form is recorded from northeastern Africa, in which the handle of the axe passes through a ring, either at the end opposite to the cutting blade or in the middle of the blade (in which case it starts to resemble a pickaxe, morphologically). These axes are recorded only from the East African coast, Uganda, Ethiopia, and a strip up the Nile, as well as on Madagascar (Widstrand 1958). There is some evidence that even these sub-Saharan Africa occurrences may well be from local blacksmiths copying European models. Similar axe-blades have also been imported into other regions of Africa (for example, Mudindaambi 1976).

Figure 21.15 Iron axes, transpierced type (top) and socketed type (bottom), both from the Dogon in Mali (courtesy of the author).

Sickles

Two types of sickles for harvesting cereals occur across Sahelian Africa, the curved sickle, with a hooked blade in a cylindrical wooden handle (Figure 21.16), and a lateral sickle (Figure 21.17).

Figure 21.16 Curved sickle (drawn from Raynaut 1984, p. 531).

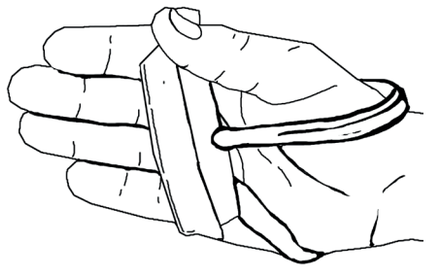

Figure 21.17 Lateral sickle (drawn from Raynaut 1984).

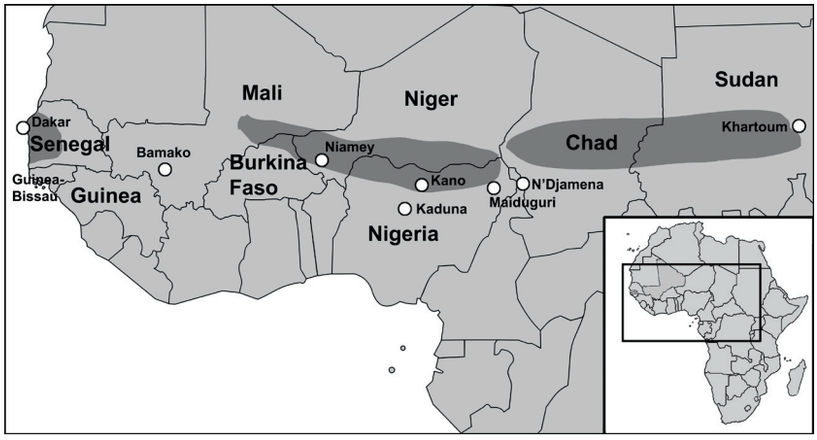

Figure 21.18 Distribution of the *iler* spade (after Raynaut 1984).

Curved Sickle

The curved sickle closely resembles small Mediterranean sickles. A Moroccan parallel can be seen in Stuhlmann (1912, p. 72). Raynaut (1984, pp. 530–31) points out that both inserted tang and socketed types of sickle exist in West Africa. In many Nigerian languages, the term is borrowed from the Hausa *lauje*, and it seems likely to have been spread southward from Hausaland. There are thus reasons to infer this is a relatively recent introduction, perhaps from the medieval period (see also Arkell 1937b), although a recent Iron Age excavation in Cameroun produced a fragment of a possible sickle from 1700–2000 B.C.E. (Meister 2010).

Lateral Sickle

The lateral sickle is an iron blade with a leather or wooden holder, attached to the hand by a loop of cord found across Sahelian West Africa (Figure 21.17). It allows the harvester to cut off the head of grain with considerable precision.

Spades, Shovels, Trowels

Compared with the hoe, the spade principle, where the blade is in line with the handle instead of perpendicular to it, is very rare in Africa. Long-handled spades, sometimes with wooden blades, occur across the Sahel, and a variety of implements similar to trowels occur in Cameroun and adjacent regions.

The Iler

Across the West African Sahel, a long-handled spade (the *iler*) is used to move earth, especially in flood plains. Daniel (1931) may have been the first to draw attention to this implement, which he records being used in the area of Sokoto in northwestern Nigeria. Pelissier (1966, *Planche* 43) includes a comprehensive series of photographs of the use of the *iler* among the Diola of the Casamance in Senegambia. This is an old North African tool and is also recorded ethnographically from Morocco. Figure 21.18 shows its approximate distribution across Sahelian Africa.

There are two discussions in print of this tool, Raynaut (1984) and Wigboldus (2000), both of whom conclude the *iler* is a relatively recent trans-Saharan migrant, although they differ on the date of its transmission. To judge by its geography, it may well have diffused across the Sahara at different times along a variety of routes, so there may be no final solution.

Trowels

The trowel is a rare agricultural implement in Africa (Figure 21.19). The literature states that it occurs in a restricted area in Cameroun and adjacent Congo and Gabon (Baumann 1944; Seignobos 2000). However, it is apparently more widespread, evidenced by a trowel collected among the Nigerian Igbo (Figure 21.20). Blade shapes vary, but at least some examples have the classic diamond shape typical of European trowels. Wente-Lukas (1977, p. 92) and Seignobos (2000) show trowels from the Mandara mountains that have a distinctive T-shaped wooden handle and socketed blades rather than the inserted blades illustrated by Baumann. Nonetheless, usage appears to be identical, to judge by Seignobos (2000, Figure 4).

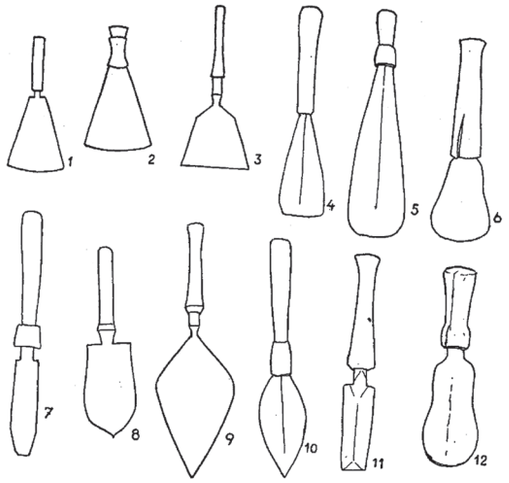

Figure 21.19 African trowel types (after Baumann 1944).

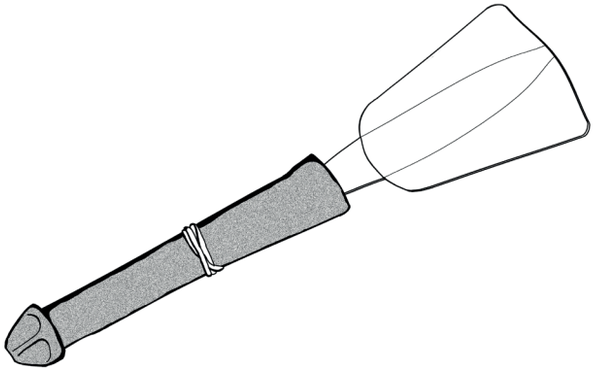

Figure 21.20 Igbo trowel, Nigeria (drawn from author's collection).

MISCELLANEA

FRUIT-HOOK

An implement of unknown date is the fruit-hook, an angled knife on a long pole, used to cut off stalks and bring down fruits from high trees (Figure 21.21). Fruit-hooks are made by the Dogon peoples of Northern Mali, who depend on a wide variety of economic trees for their subsistence. Rather more temporary implements are made widely throughout Africa, usually long bamboo canes with a bent piece of wire inserted into one end. Rather charmingly, these are known in Nigeria vernacular English as a 'go-to-hell', apparently from their resemblance to a bishop's crozier.

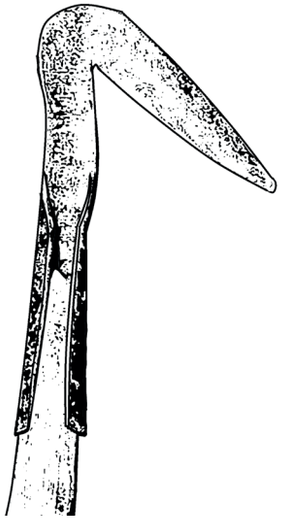

Figure 21.21 Fruit-hook from the Dogon in Mali (drawn from author's photograph).

LANGALANGA

The langalanga, or *coupe-coupe*, is a simple flat strip of metal, bent at one end, which can be used to slash at rampant grass. It is not a European tool or one of any great antiquity in Africa, and it seems to have developed in the colonial period in West Africa, based on scrap metal. Even today, it is not uncommon to see lines of schoolchildren in Nigeria disconsolately advancing across a school ground, using this tool to slash away at the grass. Although the langalanga is also known in Ghana, little information is available about its origin or distribution. 'Langalanga' was adopted as a pen name by a colonial officer for his memoirs in 1927, so it may be dated to at least this period. Moñino (1984) illustrates a type of langalanga with a cylindrical wooden handle in use among the Gbaya in CAR. FIDA (1999) pictures a very similar implement from Uganda, so it is probably widespread across Africa.

YAM EXTRACTOR

Bahuchet (2000) draws attention to a quite idiosyncratic tool, a *tarière*, used by the Aka and Baka pygmies of the Central African rain forest. It is a stick with the far end split into five strips and the free strips bent outward to form a sort of cradle. It is used for extracting a particular species of yam, *Dioscorea semperflorens*. Once the ground has been pierced by a digging stick, the yam extractor is used to dig down and pull out the yam tuber (Figure 21.22). The Aka call it *dìsó* and the Baka *bòndùngà*. Seignobos (2000)

Figure 21.22 Yam extractor, Aka pygmies (after Bahuchet 2000).

Figure 21.23 Palm-wine tapping knife, Igbo, Nigeria (courtesy of the author).

also mentions a similar tool among the Vute of the Grassfields, so this implement may not be confined to the pygmies.

Palm-Wine Tapping Knife

Figure 21.23 shows a typical palm-wine tapping knife used by the Igbo in Nigeria to pierce the trunk of the palm tree to drain off the sap to make alcoholic drinks. Such knives occur all along the forest zone of West Africa, although their exact distribution seems not to have been mapped.

Pitchfork and Rake

Raynaut (1984, p. 528) illustrates a pitchfork and rake from the Maradi area of Niger, known in Hausa as *mashaarii* (pitchfork) and *mayayaa* (rake). The pitchfork is made from a naturally forked wooden stick and is used to lift straw. Baumann (1944, p. 298) shows a similar implement from the Oromo in Southern Ethiopia. The rake is made from a stick with one end split into tongues, which are kept spread out by transverse sticks. This tool may be adopted from North Africa, although Baumann (1944, p. 298) illustrates a rake from the Sandawe in Tanzania. Copies of modern rakes of European design (that is, where the handle ends in a transverse bar along which are fixed a series of lateral strakes perpendicular to it) are now made by West African blacksmiths, but this is a recent development.

The Road Not Taken: Mediterranean Tools That Failed to Spread

Although there is a case for the diffusion of some implements across the Sahara, to a large extent sub-Saharan Africa seems to have followed its own path with respect to agricultural tools. The most notable example of an implement that failed to spread is the plough; ploughs were unknown in sub-Saharan Africa until introduced by missionaries and the colonial authorities in the 1920s. Ethiopia, as so often, seems to have quite a different history from elsewhere. The plough characteristic of Ethiopia, an ard that fractures and disturbs the soil, seems to be have been introduced following the migrations of Ethiosemitic speakers across from Yemen. The Amharic term for plough, *maräša*, , has been borrowed into all the main languages of Ethiopia. Even where this term is not used, the local terms for plough turn out to be constructs ('hoe of cow', and so on), which indicate its recent adoption. Barnett (1999, p. 24) canvasses ideas of introductions from Arabia or Egypt around 2000–1000 B.C.E., but the linguistic evidence suggests a more recent date. Neither the design of the Ethiopian plough nor its name points to external origin, and it is quite likely that this tool was constructed locally through stimulus diffusion; that is, a plough seen elsewhere was redesigned for local conditions.

All forms of animal traction have an ancient history in North Africa and, in theory at least, the plough could have been transmitted across the Sahara with the caravan trade along with food crops and irrigation techniques (Bulliet 1975). Indeed, as Bernus (1981, p. 286) points out, simple camel-drawn ground-preparation tools (*ashek n egdri*) are used in Saharan oases by the Tamasheq. This raises the interesting question as to why the introduction of the plough in the 1920s was so successful, if it had previously been rejected. The answer may lie in the challenge from the trypanosomoses. Until recently, cattle could survive the challenge of tsetse in sub-Saharan Africa through careful management by herders; subjected to work stress and kept in a single location they often died. Once better nutrition and simple trypanocides were introduced, traction cattle could stay alive and were thus an economic option.

There are other North African implements that failed to cross the desert. One of these is the pick-axe, widely

used around the Mediterranean for breaking rocks and hard earth but not recorded south of the desert. The rake and the pitchfork, although with a couple of records discussed here are probably very recent introductions.

CONCLUSIONS

African agricultural tools remain remarkably little studied by archaeologists and ethnographers, and much of what *has* been published relates to Francophone countries, giving a skewed image of the continent as a whole. Yet the introduction of iron tools introduced a revolution in the agriculture of the continent, and the need to produce iron by smelting effected a major economic transformation. This chapter has not covered the relationship between specific tool categories and agriculture practices, but there is no doubt that without iron the exploitation of the equatorial forest for subsistence other than by foraging was virtually impossible. Some broad conclusions can be drawn from our present understanding of the data.

1. The archaeological evidence suggests that African agriculture takes off relatively late, although before the introduction of iron. However, iron made it possible to exploit a range of new environments inaccessible with stone tools.
2. The diversity of African agricultural implements is probably strongly related to the availability of iron. For much of the period following the introduction of smelting iron, tools were expensive and designs were intended to save iron.
3. Wooden hoes are probably not precursors of iron hoes but subsequent copies.
4. Hoes with bound and gripped blades do not reflect a single design but the gradual introduction of traded blades to individual societies.
5. A significant number of new implements have spread across the Sahara in the last thousand years. Hence there is a relative diversity on the southern edge of the desert compared with the continent as a whole.
6. The abundant iron now available from scrap has led to a second phase of diversification of tools. However, at the same time, increased long-distance trade has tended to replace highly local tools with common designs.

REFERENCES

Arkell, A. J. (1937a) An extinct Darfur hoe. *Sudan Notes and Records XX*, 146–50.

———. (1937b) The tigda, or reaping knife in Darfur. *Sudan Notes and Records XX*, 306–07.

Bahuchet, S. (2000) La tarière à igname des Pygmées de l'ouest de bassin congolais. In C. Seignobos, Y. Marzouk, and F. Sigaut, (Eds.), *Outils Aratoires en Afrique*, pp. 237–6. Paris: Karthala/IRD.

Barnett, T. (1999) *The Emergence of Food Production in Ethiopia*, British Archaeological Reports: International Series 763. Oxford: Archaeopress.

Baumann, H. (1928) The division of work according to sex in African hoe culture. *Africa: Journal of the International African Institute 1* (3), 289–319.

———. (1944) Zur Morphologie des afrikanischen Ackergerätes. In H. Baumann (Ed.), *Koloniale Völkerkunde*, pp. 192–322. Horn, Austria: Verlag Ferdinand Berger.

Béavogui, F. (2000) Circulation monétaire en Afrique de l'Ouest: Le cas du *guinzé* (Guinée, Liberia). In C. Seignobos, Y. Marzouk, and F. Sigaut (Eds.), *Outils aratoires en Afrique*. pp. 175–90. Paris: Karthala/IRD.

Bernus, E. (1981) *Touaregs nigériens*. Paris: ORSTOM.

Blench, R. M. (2006) *Archaeology, Language, and the African Past*. Lanham, MD AltaMira.

Bulliet, R. W. (1975) *The Camel and the Wheel*. Cambridge, MA: Harvard University Press.

Cornevin, M. (1993) *Archéologie africaine*. Paris: Maisonneuve and Larose.

Coulibaly, S. (1978) *Le paysan senoufo*. Abidjan-Dakar: Les Nouvelles Éditions Africaines.

Daniel, F. (1931) An agricultural implement from Sokoto, Nigeria. *Man XXXI*, 48.

David, N. (1996) A new political form? The classless industrial society of Sukur (Nigeria). In G. Pwiti and R. Soper (Eds), *Aspects of African Archaeology*, Proceedings of the 10th Pan-African Congress on Prehistory and Related Studies (Harare, June 1995), pp. 593–00. Harare: University of Zimbabwe Press.

Dupré, M.-C. (2000) Un outil agricole polyvalent: Le couteau de culture dans les monts du Chaillu (Congo, Gabon). In C. Seignobos, Y. Marzouk, and F. Sigaut (Eds.), *Outils aratoires en Afrique*, pp. 191–25. Paris: Karthala/IRD.

Eggert, M. K. H., A. Höhn, S. Kahlheber, C. Meister, K. Neumann, and A. Schweize. (2006) Archaeological and archaeobotanical research in Southern Cameroun. *Journal of African Archaeology 4* (2), 273–98.

FIDA (1999) *Outils agricoles utilisées par les femmes africaines*. Rome: Fonds International de Développement Agricole.

Gascon, A. (1977) Le dangwara, pieu à labourer d'Éthiopie. *Journal d'agriculture tropicale et botanique appliquée XXIV*, pp.111–26.

Goody, J. R. (1976) *Production and Reproduction*. Cambridge: Cambridge University Press.

Haaland, R. (2004) Iron smelting a vanishing tradition: Ethnographic study of this craft in south-west Ethiopia. *Journal of African Archaeology 2* (1), 65–79.

Lambert, N. (1983) Nouvelle contribution à l'étude du Chalcolithique de Mauritanie. In N. Echard (Ed.), *Métallurgies africaines. Nouvelles contributions*. Mémoires de la Société des Africanistes 9, pp. 63–87. Paris: Société des Africanistes.

Lancaster, C. S. (1975) Later Iron Age hoes from Southern Zambia. *Current Anthropology 16* (2), 283.

Lericollais, A., and J. Schmitz. 1984 La calebasse et la houe : Techniques et outils des cultures de décrue dans la vallée du Sénégal. *Cahiers ORSTOM, séries Sciences Humaines XX* (3-4), 427–52.

Meek, C. K. (1931) *Tribal Studies in Northern Nigeria* [2 vols.]. London: Kegan Paul, Trench and Trubner.

Meister, C. (2010) Remarks on Early Iron Age Burial Sites from Southern Cameroon. *African Archaeological Review 27*, 237–49.

Moñino, Y. (1984) Histoires d'houes: Instruments aratoires centrafricains. *Cahiers ORSTOM, séries Sciences Humaines XX* (3-4), 585–95.

Mudindaambi, L. (1976) *Objets et techniques de la vie quotidienne Mbala*. Bandundu: CEEBA publications.

Okafor, E. E. (1993) New evidence on early iron-smelting from southeastern Nigeria. In T. Shaw, P. Sinclair, B. Andah, and A. Okpoko (Eds.), *The Archaeology of Africa*, pp. 432:48. London: Routledge.

Pelissier, P. (1966) *Les paysans du Sénégal*. Saint-Yrieix: Imprimerie Fabrègue.

Raynaut, C. (1984) Outils agricoles de la région de Maradi (Niger). *Cahiers ORSTOM, séries Sciences Humaines XX* (3-4), 505–36.

Seignobos, C. (Ed.) (1984) Les instruments aratoires en Afrique tropicale. *Cahiers ORSTOM, séries Sciences Humaines XX* (3-4).

———. (2000) Nomenclature commentée des instruments aratoires du Cameroun. In C. Seignobos, Y. Marzouk, and F. Sigaut (Eds.), *Outils aratoires en Afrique*, pp. 297–337. Paris: Karthala/IRD.

Seignobos, C., Y. Marzouk, and F. Sigaut (Eds.) (2000) *Outils aratoires en Afrique*. Paris: Karthala/IRD.

Shaw, T., and S. G. H. Daniels (1984) Excavations at Iwo Eleru, Ondo State, Nigeria. *West African Journal of Archaeology 14*, 1–269.

Stuhlmann, F. (1912) *Ein kulturgeschichtlicher Ausflug in den Aures (Atlas von Süd-Algerien)*. Hamburg: L. Friederichsen and Co.

Tessmann, H. (1922) *Die Bubi auf Fernando Po*. Berlin: Dietrich Reimer.

Tourneux, H. (1984) Vocabulaires comparés des instruments aratoires dans le Nord-Cameroun. *Cahiers ORSTOM, séries Sciences Humaines XX* (3-4), 597–612.

Vincent, A. S. (1985) Plant foods in savanna environments: A preliminary report of tubers eaten by the Hadza in Northern Tanzania. *World Archaeology 17* (2), 131–48.

Vogel, J. O. (1973) Early Iron Age hoe blades from Southern Zambia. *Current Anthropology 14* (5), 529–32.

Wente-Lukas, R. (1977) *Die materielle Kultur der Nicht-Islamischen Ethnien von Nordkamerun und Nordostnigeria*. Wiesbaden: Steiner Verlag.

Widstrand, C. G. (1958) *African Axes*. Studia Ethnographica Upsaliensia XV. Uppsala: Almqvist and Wiksells Boktryckeri.

Wigboldus, J. 2000 The early history of the *iler*: Raulin's hypothesis revisited. In C. Seignobos, Y. Marzouk, and F. Sigaut, (Eds.), *Outils aratoires en Afrique*, pp. 149–72. Paris: Karthala/IRD.

White, K. D. (1967) *Agricultural Implements of the Roman World*. Cambridge: Cambridge University Press.

———. (1975) *Farming Equipment of the Roman World*. Cambridge: Cambridge University Press.