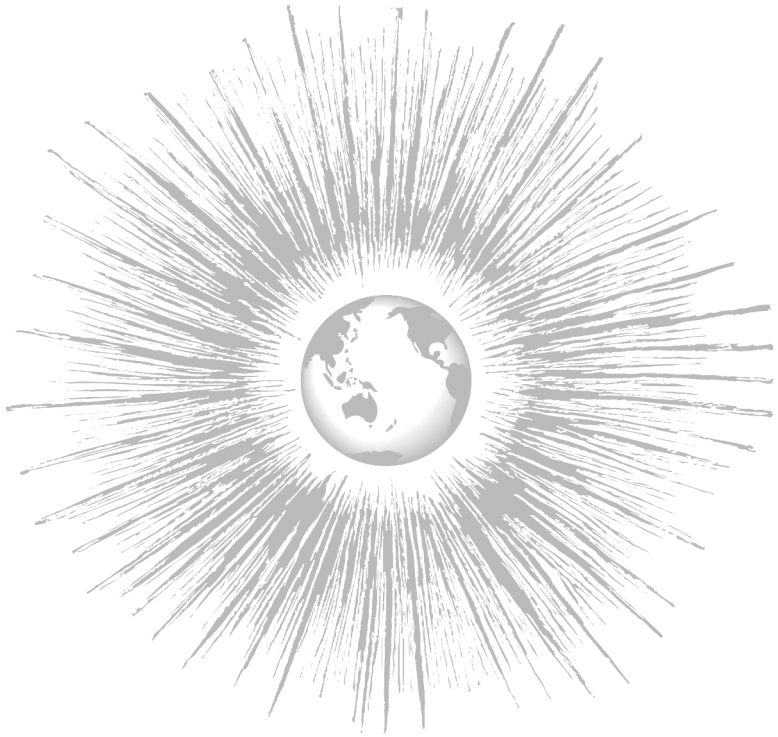


ABSTRACT:

Archaeological evidence from West Africa suggests a process of relatively autochthonous state formation involving unusual forms of urbanization, horse warrior aristocracies, craft status groups and commodified trade networks organized by merchant-scholars. The emergence of a West African state system played a generative role in the world-historical development of universal rationality in Western Afroeurasia, as well as in the intensification of empire formation and monetary integration in the formative era before the rise of European hegemony.

Expansions And Contractions: World-Historical Change And The Western Sudan World-System (1200/1000 B.C.–1200/1250 A.D.)*

Ray A. Kea

PART ONE: HISTORY, CHRONOLOGIES, AND THE NEW ARCHAEOLOGY

Introduction

By the 12th century A.D. the principal trading centers of the Western Sudan world-system—including Kawkaw/Gao, Tadmakka, Koumbi Saleh, and Tegdaoust/Awdaghast—possessed, in the words of the archaeologist Timothy Insoll, an "Islamic character." He elaborates on this phenomenon: "Their plans indicate that they exhibit many of the characteristics of the Islamic city or town as is found within the wider Islamic world" (Insoll 1996: 43; also Mauny 1967). What history accounts for the Islamic character of these places, and what processes, events, and relations generated their development? Recent archaeological research in West Africa provides some answers. The present study offers a re-interpretation of Western Sudan history based on the recent archaeological research. Recent archaeology has generated a tremendous amount of new information pertaining to the cultural, economic, political, and social aspects of this history (Bedaux 1972; *Vallées du Niger* 1993; McIntosh 1995; Pelzer 2000;

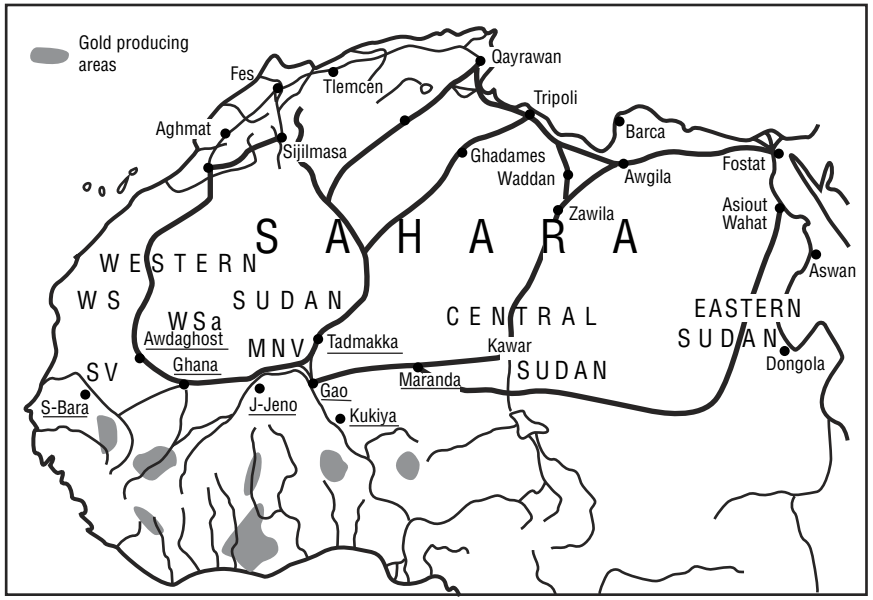
Ray A. Kea
Department of History
University of California at Riverside
ray.kea@ucr.edu
http://history.ucr.edu/

* This article is a revision of a paper presented at a workshop of the University of California Multi-Campus Research Unit in World History, February 8–9, 2003, University of California, Irvine. I wish to thank the anonymous reviewer for her/his comments and suggestions. In addition, I wish to extend my gratitude to Ms Linda Bobbitt for preparing the maps. Not least, I would like to thank my wife, Inge, for proof reading the manuscript.

JOURNAL OF WORLD-SYSTEMS RESEARCH, X, 3, FALL 2004, 723–816
http://jwsr.ucr.edu/
ISSN 1076–156X

© 2004 Ray A. Kea

Figure 1 – Sudanic Africa and Interaction Networks (8th–10th Century A.D.)



Note: Towns in the Western Sudan world-system are underlined. (Adapted from Mauny 1967)

Pelzer 2002; Magnavita 2002a; Magnavita 200b; Magnavita and Pelzer 2000). Since archaeological fieldwork is ongoing and continues to bring new data to light, the interpretations and conclusions presented here cannot be considered definitive.

In this study I focus on a polycentric Western Sudan world-system between ca.1200/1000 B.C. and ca.1200/1250 A.D. and the ecological, historical, and structural processes that shaped the cultural-ideological, social, political, demographic, and settlement formations and structures of the system. I compare the archaeologically defined historical phases of the Western Sudan's differentiated formations—urban, cultural, socioeconomic, and political—with the chronology assigned to the Afro-Eurasian oikumene by Barry Gills and Andre Gunder Frank (see below). In contrast to standard political histories, the current study examines the dynamic of the great state systems in terms of a macroregional world-system and the historical conjunctures, interaction networks, and processes of surplus appropriation and political centralization that defined it. Characteristically, the state systems had ruling dynasties, specialized functionaries, armies, and revenue systems (cf. Levtzion 1980, chapter 2; Levtzion 1985: 132–38; Levtzion and Hopkins 2000: 77–83; McIntosh 1998, chapter 10).

What is Sudanic Africa? The 10th century geographer Ishaq ibn al-Husayn offers a suitable historical starting point. He describes it thus: "The land of the Sudan, an extensive country, stretching from the Western Sea [Atlantic Ocean] to the Red Sea [is] an enormous and important land" (Levtzion and Hopkins 2000: 38). Geographically, this vast territory comprises three major ecological zones—the Sahara, and, south of it, the semi-arid Sahil and the savanna, or grasslands—and a complex of microenvironments. Africanist scholars divide the Sahil and grasslands into three macroregions: the Western Sudan (historic cores: the Upper and Middle Niger Valleys and the Senegal Valley), the Central Sudan (historic core: the Lake Chad basin), and the Eastern Sudan (historic core: the Middle Nile Valley) (see Figure 1).

Associated with each macroregion are identifiable world-system formations (Wilkinson 1993a; Wilkinson 1993b; Wilkinson 1994). Established scholarly practice does not accept the Sahara as a historical and social space, hence the salience of a reified and essentialist category like "sub-Saharan Africa" in academic and popular literature. In scholarly studies of world-systems or of the Afro-Eurasian oikumene, Sudanic Africa is seldom, if ever, mentioned. The presumption of this scholarship is that nothing of consequence happened within it and that whatever organized formations it had were completely self-contained ("isolated") and unchanging ("stagnant") (e.g., Abu-Lughod 1989; Sanderson 1995; Hall 2000). The present study contravenes conventional wisdom by including the Sahara as a historical and structural component of the Western Sudan world-system and by identifying this world-system as a historically dynamic part of the oikumene.

A world-system can be defined as a formation organized around stratified, i.e., hierarchical, and non-hierarchical societal interaction networks, strata, consisting of core, semi-periphery, and periphery. Intermediate territories are identified in analytically different ways: hinterland, frontier, and margin. The complexities are evident when we look at centers and peripheries of innovation and recognize frontiers of economic specialization. In developing the idea of regional world-systems, Christopher Chase-Dunn and his colleagues have identified different kinds of societal or interacting networks to account for the allocation of resources and the distribution of goods and services. They include the following: (1) bulk-goods exchange networks (BGNs); (2) political-military interaction networks (PMNs); (3) prestige-goods networks PGNs); and (4) information-cultural networks (ICNs).[1] The different networks indicate differ-

1. These and other abbreviations in the list on page 805.

ent scales of socio-spatial organization and different but overlapping functions (Chase-Dunn and Hall 1992; Chase-Dunn and Hall 1995; Chase-Dunn and Hall 1997; Hall 1996). The organization of the Western Sudan world-system depended on these interacting networks—the allocation of resources and the distribution of goods and services. But the networks themselves depended on specific historical forms of labor comprising hierarchically and non-hierarchically organized populations as well as modes of production of the material and intellectual (symbolic) conditions of life. The histories of these networks and modes have yet to be written. A first step towards understanding them has been made by Africanist archaeologists whose fieldwork over the past thirty years has focused on developing regional surveys over broad areas of the Sudan's macroregions.

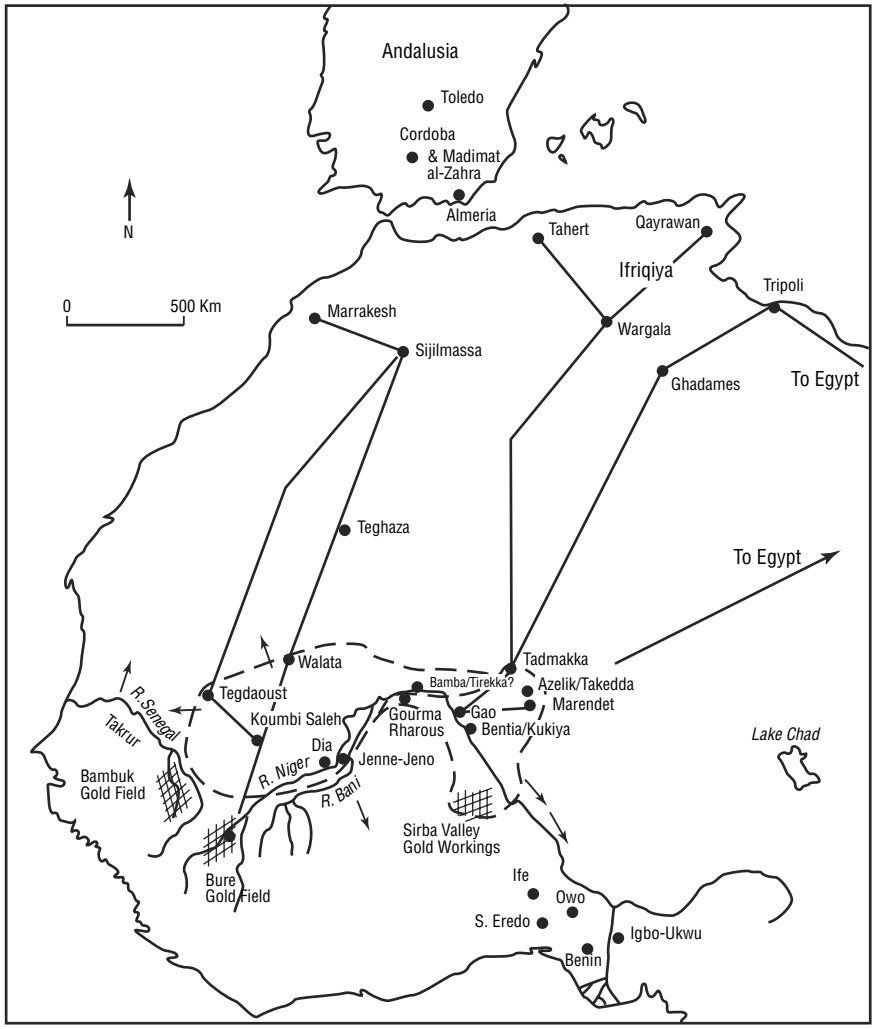
What is the Western Sudan world-system and when did it emerge? This world-system can be defined as a trans-regional, polycentric formation comprised of interaction networks, urban-based settlement hierarchies, different kinds of political domains and regimes of surplus accumulation, economic zones, production networks, social and geographical divisions of labor, cultural spheres, and markets. Four core zones can be readily identified (see Figure 1 above):

(1) the Western Sahara (WS);
(2) the Middle Niger Valley (MNV), with the following sub-divisions: (a) the Upper Inland Delta; (b) the Lower Inland Delta; and (c) the Lakes Region and the Niger Bend;
(3) the Western Sahil (WSa);
(4) the Senegal Valley (SV).

I suggest that this world-system emerged in its urban form around the mid-second millennium B.C. The initial core zone appeared in the southern reaches of the Western Sahara about this time. In the early first millennium B.C. other urban cores (or heartlands) appeared, specifically in the Western Sahil, the MNV, and the SV. Associated with the core areas were dependent territories (e.g., hinterlands and peripheries).

The MNV, the WS, and the WSa constituted the demographic and economic cores of the world-system before the 13th century A.D. The MNV was known as the land of Wangara in Muslim geographical sources and in the works of Latin Christian cartographers it was called Palolus (or Pactolus or Paliola). Wangara and Palolus designated an island or land rich in gold (Taylor 1928; Levtzion and Hopkins 2000: 111). In this context, Ishaq ibn al-Husayn's reference to the Sudan as an important land (to the Islamic world) becomes

Figure 2 – Ghana/Wagadu and Kawkaw/Gao tributary systems and interacting networks and Lower Niger basin centers.



Adapted from Insoll 2000

patently clear. After 1200 A.D., massive population resettlement occurred in the floodplain of the western MNV, with the abandonment of large numbers of settlements, and the occupation of lands above the floodplain. This transformation has been attributed to climate change, environmental degradation, and sociopolitical upheavals. From the 13th century to the 15th, when the imperial Mali formation governed much of the world-system, the Upper Niger Valley,

a former peripheral formation, became the dominant core zone (Monteil 1929; Levtzion 1980; Levtzion 1985).

The systemic merger of the MNV and WS social formations in the second millennium B.C. marked the initial development of the Western Sudan world-system (cf. MacDonald 1996). Western Sudan urbanism emerged in a context of expansion and intensification of the geographical scale of interaction networks. Large settlements and intensified interaction were consequences of important changes in the mode of surplus appropriation and distribution, which were guaranteed by ruling military aristocracies, with their cavalary-based armies, and merchant groups associated with the state systems of Ghana/Wagadu, Kawkaw/Gao, and Takrur (Levtzion 1980; de Grunne 1980; *Vallées du Niger* 1993: 548, 552; Cornevin 1998: 206–07; Cissé 1998). The dominant and dominating tributary polities were surplus centralizing pivots where land was a dominant form of property and the organization of production importantly organized at the level of the state society. The accumulation and circulation of social surpluses accounted for the importance of specialized crafts, administrative systems, urban centers, long-distance commerce, warfare, the development of artworlds and music and the emergence of new religious and ritual expressions (for tributary societies see Amin 1980; Amin 1989; Amin 1993). Ghana/Wagadu and Kawkaw/Gao, whose spaces of surplus centralization were considerable, represented the two most dominant social-political systems in the world-system during most of the first millennium A.D (see Figure 2). The organization of their power hierarchies crystallized populations into politically dependent urban clusters and tribute-paying areas, within which ideological/symbolic spheres were founded on broad systems of particular cosmological, historical, mythological, and metaphysical references, classifications, and definitions (Monteil 1953; Gado 1986). In the course of the 8th and 12th centuries A.D. the world-system's core areas assimilated and reconfigured Kharijite and other expressions of Islam (Sunni Malikism, Shiism, and Mahdism).

Archaeology

In a 1994 essay the archaeologist Susan Keech McIntosh drew attention to the cutting-edge nature of recent archaeological research: "We are currently in the midst of one of the most exciting periods ever in West African archaeology." She further contended that research agendas were pushing at the frontiers of archaeological theory (McIntosh 1994:165,166).[2] Archaeology's methodologies

[2] For studies of world-systems and the use of archaeological evidence see Hall and Chase-Dunn (1993) and Peregrine (2000).

and conceptual frameworks have changed rather drastically over the past 30 years. Before the 1980s the fieldwork of most Africanist archaeologists had carefully defined priorities: single site discovery, excavation of the site, inventory of recovery artifacts, and chronology of the site. This vertical dimension focus concentrated on the excavation of a site's occupational levels. More recently, research has shifted focus to the horizontal dimension—so-called survey archaeology. First and foremost, archaeologists' projects have a broad territorial scope within which site surveys are conducted over a wide expanse. This approach, supplemented by intensive surface investigation and the excavation of deeply stratified mound sites within the research area, seeks to understand processes of population aggregation (clustering, settlement hierarchy formation, and urbanism) as well as spaces of innovation and specialization. Consequently, archaeologically-defined regional and sub-regional data sets, on settlement dynamics, economic geography, and the spatiality of social and political organization, have become available (Raimbault and Sanogo 1991; McIntosh 1994; McIntosh 1995; McIntosh 1998). The horizontal, or survey, approach has provided the first unambiguous evidence of regional settlement hierarchies and urbanization in the Western Sudan in the second and early first millennium B.C. (Holl 1993; Vernet 1993, chapter 7; Bedaux et al 2001).

At present, there are several current continent-wide archaeological survey projects. One project, "Mapping Africa's Visible Archaeology," began in 1996. Its purpose is "to map all of Africa's visible archaeology, beginning with Nigeria and West Africa." A quote from the project's website report gives an idea of the importance and scope of its findings:

> Between Lake Chad and the Atlantic Ocean, there are about 10,000 town walls, 25% or more of them on deserted sites. They represent the largest concentration of past urban civilization in black Africa; yet only a handful [have] been surveyed. There are also about 250,000 unsurveyed tumuli, several million uncharted iron-smelting sites, and an unknown number of ancient terracotta sites, most of which have been looted. Old aerial photographs and more modern remote-sensing methodologies offer an opportunity to record much of what will otherwise soon be lost altogether ("African Legacy" n.d.)

One of the arguments of this study is that the productive forces of pre-13th century core areas of the Western Sudan world-system were responsible for many of the town walls, tumuli, and iron-smelting and terra cotta sites (for relevant references to some of the sites see Monod 1948; Mauny 1950; Mauny 1967; Raimbault and Sanogo 1991; McIntosh 1995; McIntosh 1998; Insoll 1996; Insoll 2000). Any historical analysis or interpretative and conceptual understanding of the West African dimension of the Afro-Eurasian oikumene has to begin

with the visible archaeology—including artifacts and technologies—of the core zones of Sudanic Africa.

As the archaeologist R.J. McIntosh notes, the visible archaeology, of the MNV floodplain is impressive.

> The flood plain of the Middle Niger of West Africa is lined with hundreds of ancient tells rivaling those of Asia both in area and in clues to the emergence of city life.... The Middle Niger is dominated by numerous monumental tumuli (McIntosh 1991: 203).

Other archaeologists confirm this observation. The pre-12th century MNV was characterized by "an amazing density of settlement," "several massive habitation sites," and by "[monumental] elite tumuli burials" (Szumowski 1957; Mauny 1967; Mauny 1971: 78–81; Barth 1976; Barth 1977; Raimbault and Sanogo 1991; MacDonald n.d.). Tells, or tumuli, are artificial hills, formed entirely from the debris of human occupation. Many of the MNV floodplain tells are the remains of ancient cities or towns but most are the ruins of villages. They have been abandoned over the last 600–900 years. A smaller number of tells—truncated pyramids, some up to 18 meters in height on a base of 150 to 290 square meters—are the tombs or burial mounds of military-political elites. Intact tombs have yielded an abundance of grave goods. What history explains the presence of tells on such a scale? What processes governed the formation of an amazing density of settlement, and what factors were decisive in the building of monumental elite tumuli burials? Can the visible archaeology of the MNV be explained as local adjustments to the systemic logic of oikumene historical development? Archaeological fieldwork provides evidence of different periods of economic and demographic expansion and social development as well as periods of contraction and crisis. In the current stage of research only partial answers can be given to these questions.

The 120,000 km² MNV and the smaller MSV, (25–30,000 km² in area), are about 1200 kilometers apart. Both comprised fertile floodplains, averaging 100 kilometers in width in the case of the MNV, and 20 kilometers in the case of the MSV. Both had complex micro-ecologies, especially the MNV. Beyond the deep and low basin floodplains were semiarid uplands and levees, and in the case of the MNV pasturage. Both are closely linked to the Sahil and the southern Sahara. It is no accident that the floodplain of the MNV has a concentration of tumuli. Cutting across the semi-arid Sahil, the floodplain formed a vast interior region of swamps and lakes that was fed by the Niger and Bani rivers. Six months of each year an alluvial plain of over 50,000 km² is covered by floodwaters. Producing two crops a year, the floodplain permitted the production of vast surpluses of staple crops. These were marketed in urban settlements,

supplying Saharan copper and salt mining centers and oasis towns located 500 to 1500 kilometers away.[3] Deployed along trade routes, Saharan oasis and mining communities, sustained by commerce alone, were entirely dependent on the agricultural production of the MNV and SV floodplains. The interaction networks included the transportation of bulk goods (food staples, craft goods, and salt) and prestige goods (gold, copper, and semi-precious stones). The sheer scale of the visible archaeology is a striking indication of the magnitude and density of exchange networks—BGNs and PGNs—and the expanding capacity of the world-system's regimes of accumulation over the *longue durée* (Connah 2001: 112, 142; cf. Hadj-Sadok 1968; Levtzion and Hopkins 2000, passim).

Typically, pre-13th century floodplain urban centers had multiple hinterland settlements that functioned as specialized communities. Specialized corporate groups (guilds, associations, castes, and the like) inhabited these communities, which supported the cities and towns. It is apparent that central urban functions were dispersed and distributed in subordinant settlements, which were organized around a primary, dominant node. Archaeologists call this settlement complex an "urban cluster", meaning that a central place, often fortified, was surrounded by dependent, functionally specialized communities up to a distance of 25 kilometers. Since only one of the settlements served as the dominant center, an urban cluster formed a settlement hierarchy. A multi-functional central node had a dependent hinterland of specialized smaller settlements, which served as home to a heterogeneous population. Some clusters became what one archaeologist calls "urban polities" (or city-states) and others developed into centralized states (or kingdoms). Having emerged in the first millennium B.C., the urban cluster was the dominant settlement pattern in the MNV and the SV until the early 13th century. Its history was bound up with particular patterns of surplus centralization and circulation that gave rise to divisions of labor—occupational and settlement specialization—and other forms of cultural and social differentiation. One of the settlement forms that emerged out of the urban cluster system—by the 7th or 8th century A.D.—was the double city or town joined by a road lined with habitations. In this form of urbanism one town served as the seat of political administration and the royal court, and the other town, situated from one to ten kilometers away, served as the residence of Muslim and other merchants. The royal town represented the political centralization of the surplus as rent, tax, and other imposts. The trading town represented the commercial centralization of the surplus as merchant capital.

---

3. On food crops in the medieval Western Sudan see Lewicki (1974).

This form of urban organization, and variations of it, became became relatively common after the 13th century.

Chronologies

Andre Gunder Frank and Barry Gills identify alternating cycles of growth/expansion and crisis/contraction in the Afro-Eurasian oikumene. For whatever reason, Sudanic Africa is not part of their study. Two of their periods are pertinent to the present discussion:

I. The Iron Age Axial and Classical Periods, 1000 B.C. to 500 A.D.
   - A-phase expansion, 1000–800 B.C.
   - B-phase crisis, 800–550 B.C.
   - A-phase expansion, 350–250/200 B.C.
   - B-phase crisis 250/200–100/50 B.C.
   - A-phase expansion, 100 B.C.–200 A.D.
   - B-phase crisis, 200/250–500 A.D.

II. The Medieval and Early Modern Periods, 500–1500 A.D.
   - A-phase expansion, 500–750/800
   - B-phase crisis, 750/800–1000/1050
   - A-phase expansion, 1000/1050–1250/1300
   - B-phase crisis, 1250/1300–1450

(Gills and Frank 1993: 157–80; Bosworth 1995).

What is the correlation, if any, between the archaeological and documentary evidence pertaining to the Western Sudan world-system and the global fluctuations of A- and B-phases hypothesized by Gill and Frank? Did the Western Sudan system have its own autonomous A- and B-phases? These questions will be addressed in the sections that follow.

In a series of articles David Wilkinson addressed the question: "How many civilizations [i.e., world-systems] were there in Africa? When? Where?" He defines a world-system/civilization as a network of interacting states containing cities. He defines cities as large settlements. "Cities are operationally defined as population centers with not fewer than 10,000 inhabitants." Smaller settlements are labeled "towns." Beginning with the 9th century A.D., Wilkinson provides size estimates and a chronology of "West African/Western Sudanic cities":

A.D. 800	Gao, 72,000
	Ghana, 30,000
A.D. 900	Gao, 40–36,000
A.D. 1000	Ghana, 30,000
A.D. 1100	Gao, 35–32,000
A.D. 1200	Gao, 25,000+
	Ghana, 25,000
	Walata, 25–20,000
	Zagha, 20,000

(Wilkinson 1993a; Wilkinson 1993b; Wilkinson 1994: 46–47, 52–53).

Recent excavations and surveys indicate that Wilkinson's reported city size estimates require revision (see below). His use of an arbitrary cut-off of settlement size to indicate the presence of an urban system is somewhat inappropriate in the case of the Western Sudan because of the presence of urban clusters and double cities. Archaeologists working in the MNV, for example, identify urban clusters as a dominant urban settlement system during an extended period of Western Sudan history, namely from the first millennium B.C. to the early second millennium A.D. In their view population size of a single settlement is less important than the nature of the settlement's multi-functionality (specializations), its social composition (heterogeneity), and its position within a network of proximate and interacting settlements (nodality) (Raimbault and Sanogo 1991; McIntosh and McIntosh 1981; McIntosh 1991; McIntosh 1995; McIntosh 1998).

Archaeologists working on Jenne-Jeno, a MNV site, offer examples of what constitutes an urban unit at different historical moments. They have produced the following population range for the city in the first millennium A.D.

A. Jenne-Jeno (33 hectares [ha.] the built-up area of the settlement)
   (1) 146 persons per ha.=4,800[4]
   (2) 221 persons per ha.=7,300
   (3) 389 persons per ha.=12,800

[4] The population density (persons per areal unit) of settlements is influenced by the percentage of the built-up area that is devoted to residences versus other uses, the sizes and spacing of residential buildings, and the sizes of households. Most settlements have a population density of between 100 and 400 persons per hectare.

B. Jenne-Jeno and Hambarketolo (33+8.8=41.8 ha.)
146 persons per ha.=6,100
221 persons per ha.=9,200
389 persons per ha.=16,260

C. Jenne-Jeno cluster (+ 25 satellite sites within 1 km.) (33+35.7=68.7 ha.)
146 persons per ha.=10,000
221 persons per ha.=15,200
389 persons per ha.=26,700

In all three cases the settlement unit, whether a single town, a double town, or a settlement cluster, is called Jenne-Jeno (McIntosh 1995: 374–75. See Figures 13, 15, and 16 below). Wilkinson's definition of urban does not include urban clusters like Jenne-Jeno. It is appropriate to recognize the specific forms of urbanism at different historical moments within the world-system. These differentiated developments have yet to be carefully analyzed and theorized.

Among the floodplain sites Jenne-Jeno was "only one of more than a dozen settlements of comparable size now known from the Middle Niger, and if one were to consider smaller settlements only one of thousands" (MaDonald n.d.). It was by no means the largest urban cluster complex in the MNV in the first millennium A.D. There were contemporary urban clusters that were five times as large in area, had three times the resident population, and had organized hinterlands of satellite settlements many times the size of Jenne-Jeno's (McIntosh 1995; McIntosh 1998). These settlement clusters formed the massive habitation sites of the MNV.

It is useful to consider another different kind of periodization. Africanist scholars have devised a chronology that defines what they call "ecological-historical eras." This chronology draws attention to the impact that environment and climate had on societies, communities, and events. Archaeologists, in particular, regard environmental change as fundamental in understanding the dynamics of West African history (cf. McIntosh 1998; MacDonald 1998). Without minimizing the significance of environmental and climate history, there is a danger of subscribing to ecological determinism or reductionism and ignoring the play of human agency within historical materialist and political economy frameworks. The historian George Brooks provides a generally accepted chronology, which is followed here. Only the ecological-historical eras relevant to this study are considered:

(1) Ending of Atlantic Wet Phase: ca. 2,500/2000–ca. 300 B.C.

(2) Transitional Arid Phase: ca. 300 B.C.– ca. 300 A.D.

(3) Wet Phase ("favorable ecological conditions"): ca. 300–ca. 1100.

(4) Dry Phase ("horse warriors and conquest states"): ca. 1100–ca. 1500

(Brooks 1998; also McIntosh 1998, chapter 2; Connah 2001: 113).

Between 200 B.C. and 100 A.D. the Sahil experienced significant dry episodes, which were part of the general drying trend that had been seriously underway since ca. 2000 B.C. Southern Saharan populations moved southward along southward-draining river systems where they found more congenial environments. Two of these were the great floodplains of the MNV and the SV, with their rich alluvial soils and flood regimes suitable for the cultivation of rice and other grain crops (McIntosh 1998, chapter 6; Macdonald n.d.). While the movement of a population can be explained in terms of favorable or unfavorable ecological conditions, the latter do not account for that population's organization into clustered settlement hierarchies or into patterns of socioeconomic differentiation. In other words, ecology alone cannot explain the organization of the mode of production of the material conditions of life in cores, peripheries, or urban clusters.

A number of archaeologists and historians believe that climate change had an impact on political developments and events in the Western Sudan, particularly after the 11th century. However, this interpretation does not take into account any changes—quantitative or qualitative—in the systems of surplus appropriation and accumulation. On an oikumene scale, the first millennium A.D. corresponds to cyclic A- and B-phases (Gills and Frank 1993). Climatologically, the period corresponds to a wet phase in West Africa that lasted from ca. 300 to ca. 1100. These centuries were a time of large political and economic transformations in the Western Sudan world-system (see below). In Brooks' interpretation the beginning of the 12th century was a watershed moment—a new political era—characterized by the emergence of horse warriors and conquest states and a moment when cultural hegemonies struggled for dominance. There would seem to be a critical connection between the emergence of these domains of power, on the one hand, and the appearance of new iconographies of power, on the other—e.g., the construction of colossal tombs and the creation of large commemorative terracotta effigies of armed horsemen (De Grunne 1981: 12; Brooks 1998: 149–50; also de Grunne 1980: 43–45).

Archaeological data have shown that throughout the entire MNV urban development followed a similar pattern of settlement clustering. Between 700/800 and 1100/1200, population peak and clustering in densely occupied settlements were common features throughout most of the floodplain (Raimbault and Sanogo 1991; McIntosh 1995; McIntosh 1998). On these grounds the entire first millennium A.D. would have constituted an MNV A-phase without any

obvious B-phase breaks. But in the chronology of the Afro-Eurasian oikumene there were alternating B- and A-phases during this period. The expansionist era was followed by the gradual abandonment of floodplain settlements and population decline between 1100/1200 and 1300/1400. Archaeologists attribute these profound changes to increasing aridity and the colonization of pastures and arable lands above the floodplain (McIntosh 1995: 372–77). That is, there was a major population shift from one kind of agrarian regime to another. Millet, fonio, and sorghum, which may be grown from dry sub-humid zones through the semiarid and arid zones on the southern fringes of the Sahara, replaced rice, which requires abundant moisture, as food staples. The rice-based agrarian regime was tightly interlocked with an urban artisanal economy, which favored the concentration of rural surpluses (in the form of clustered settlements). The dry phase that impacted the floodplain from ca.1100 to ca.1500 led to the drying up of lakes and other watercourses. The agricultural colonization of the light-soil levees and décrue above the floodplain were one consequence, and the agrarian regime that was set up was closely tied to pastoralism and transhumant herding, which favored the dispersal of rural surpluses. A further consequence was the decline of the urban cluster system. Thus, large urban centers, like 13th century Walata or 15th century Timbuktu, tended not to be surrounded by clusters of subordinate settlements but by a wide scatter of single village communities (McIntosh 1995: 372–77; McIntosh 1998: 199).

Summary

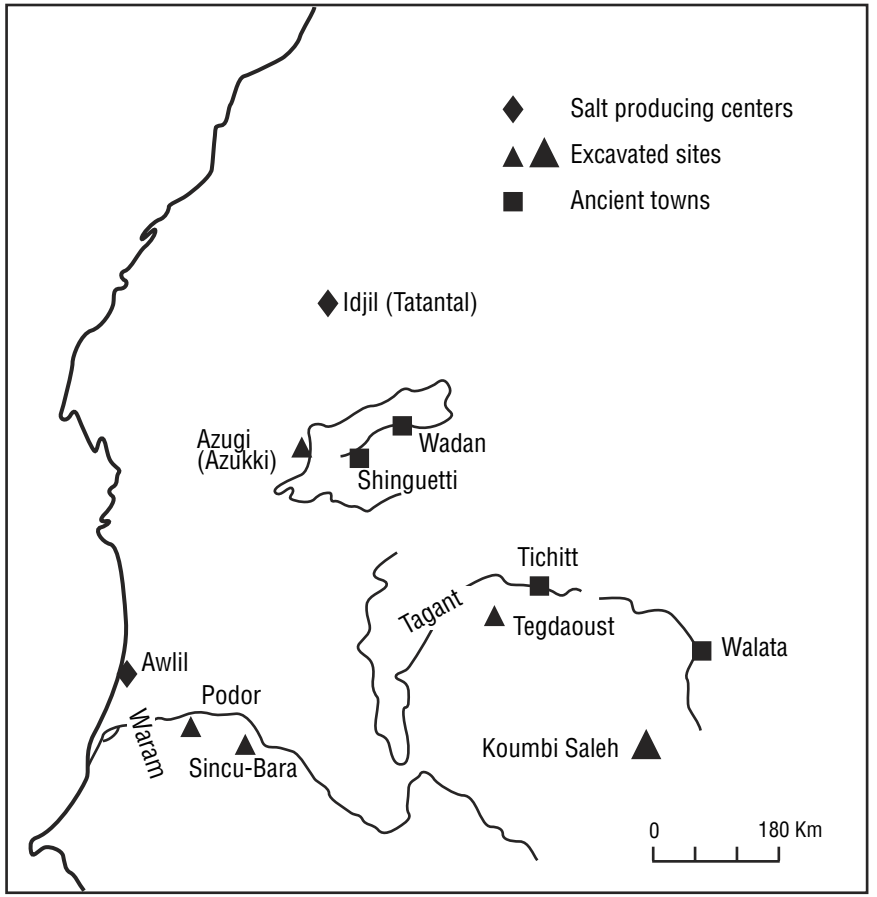
The interaction networks of the Western Sudan constituted a world-system centered in the basins of the Niger and Senegal River Valleys. In studies of the pre-modern Afro-Asian oikumene this world-system is excluded. The chronology and history of the world-system can be constructed on the basis of archaeological fieldwork carried out from the 1970s to the present. Archaeological surveys have revealed that the MNV floodplain is lined with thousands of tumuli, dating to the early first millennium B.C. and the first millennium A.D. The decline of the urban cluster form of urbanism and the gradual depopulation of the MNV floodplain occurred between 1100 and 1300. Archaeologists and historians attribute these developments to climatic change and political-military upheavals, without relating them in any way to the processes of social production.

PART TWO: THE WESTERN SUDAN WORLD-SYSTEM I

The Western Sahara and the Western Sahil

Before 2000 B.C. significant numbers of herders and farmers lived in what is today the southern Sahara, where they raised cattle, sheep, and goats, grew

Figure 3 – Western Sahara, Senegal Valley, and Western Sahil Sites

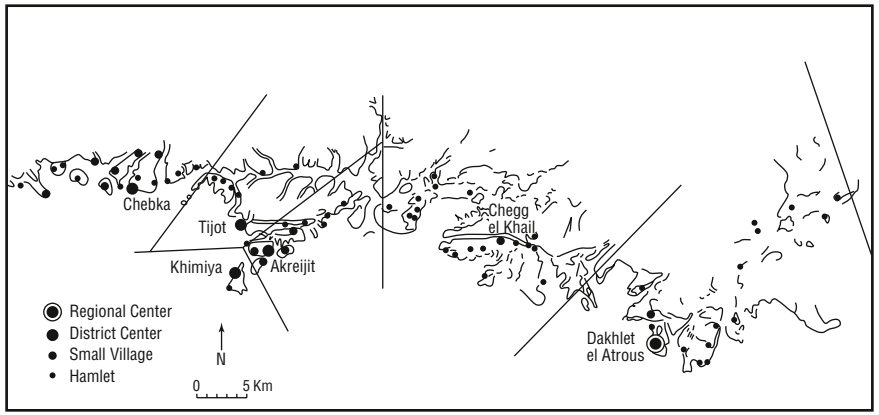


Adapted from Berthier 1997

millet, hunted and fished in an environment of shallow lakes and grassy plains. These peoples were organized in spaces defined by exchanges over a wide area and their elites built funerary monuments for themselves over a period extending from ca. 4000 to ca.1000 B.C. The surplus was, in part, collectively used (cf. MacDonald 1998; also Smith 1992: 154–67). Environmental change and internal economic and social developments—e.g., peasantization—transformed the population in the second half of the second millennium and the first half of the first millennium B.C.

New relations of production centralized the social surplus and organized power and settlement hierarchies. Towns, villages, and hamlets of substantial stone masonry were built on the rocky promontories of the Tichitt-Walata and

Figure 4 – Distribution of Tichitt Tradition Sites–Early 1st Millennium B.C.



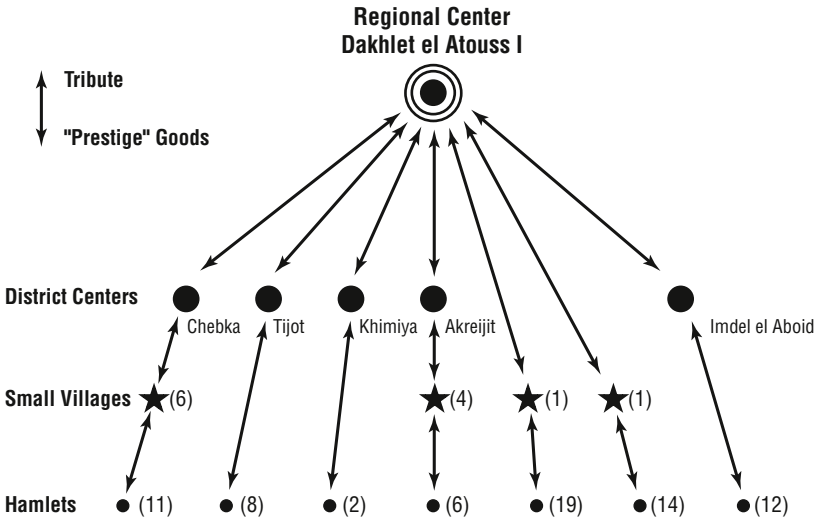
From Holl 1993

Tagant cliffs in the WS. In the plains below the cliffs, settlements of varying sizes and herding encampments were established. Archaeologists who name this historical formation the Tichitt Tradition date the settlements from about 4000 to 2000 years ago. The productive systems enabled the settlements to sustain a relatively dense population for a very long time (Holl 1993; Vernet 1993, chapter 7; Aumassip 1996: 14–15; Grebenart 1996; Khattar 1996; MacDonald 1998: 93–94; MacDonald n.d.). With its hundreds of settlements, the Tichitt Tradition is the earliest known urban-based core zone in the Western Sudan world-system. In the words of one archaeologist, its abandoned sites represent "a great wealth of rather spectacular prehistoric ruins" and "perhaps the most remarkable group of Neolithic settlements in the world" (Mauny 1971: 70). In their distribution and size, the ruins reveal the effects of the spatialization of surplus centralization and distribution and the political relations and practices of power hierarchies. The power hierarchy model of the Tichitt Tradition was to expand to other areas in the first millennium B.C.

An urban core zone developed in the WS in the first half of the second millennium B.C. It represents the earliest known phase of urbanization in the Western Sudan world-system and occurred along the escarpments of Dhar Tichitt, Dhar Walata, and Dhar Tagant between 1600/1500 and 1000/900 B.C. (for an overview, see Mauny 1950; Vernet 1993, chapter 7. See Figure 3).

The Dhar Tichitt and Dhar Walata core formation consisted of more than 400 dry-stone settlement sites—hamlets, villages, and towns with clear street layouts—that were strung out along the escarpments for a distance of several hundred kilometers. Some settlements had massive surrounding walls, while others were not fortified. In a deteriorating environment, where arable land

Figure 5 – Four-tier settlement hierarchy (Tichitt Tradition) with the directions for the flows of tribute and prestige goods.



From Holl 1993

and pasturage were at a premium, the population grew and relatively large-scale political organizations emerged which no doubt explains the homogeneity of architecture, settlement patterns, and material culture (e.g., lithic and ceramic traditions). With a mixed farming economy—millet production combined with the rearing of cattle, sheep, and goats—this copper-using settlement complex imported from distant parts of the Sahara and Sahil stone bracelets, beads made from semi-precious stones, etc. Crafts, hunting, and fishing were other important economic pursuits (Mauny 1950: 36, 39; Munson 1980; Holl 1985; Holl 1993; Vernet 1993, chapter 7; MacDonald 1998: 74–77, 78, 79, 84–85, 93–94, 98–99; Connah 2001: 116–17).

Archaeological studies of this region have focused on site surveys and surface collections at the expense of site excavations. Still, surveys have been informative. The archaeologist Augustin Holl surveyed 90 settlements along a 100-kilometer stretch of the Tichitt-Walata escarpment. He ascertained that urbanization took the form of a 4-tier central place hierarchy in which the compound cluster was a dominant feature of each settlement. Settlements were grouped according to four ranks and the areal extent of compound clusters in each settlement unit was determined by the unit's position in the hierarchy (see Figures 4 and 5):

1st rank, one regional-center (Dakhlet el Atrous I) (80.5 ha. with 540 compounds) and its satellite site (12.25 ha. with 50 compounds) measured 92.75 hectares with 590 compounds;

2nd rank, 5 district-centers with 120–198 compounds;

3rd rank, 12 villages with 20–50 compounds;

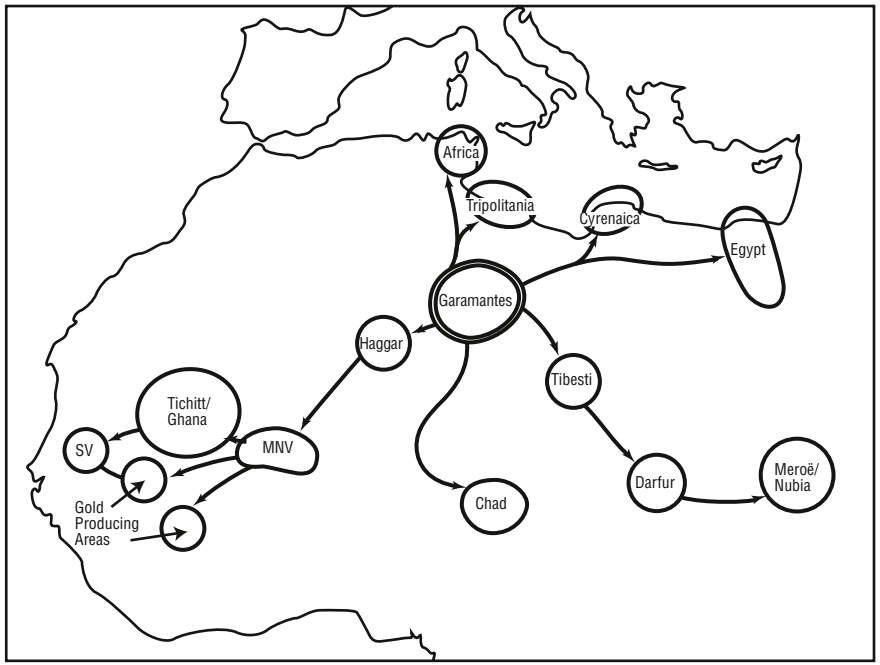
4th rank, 72 hamlets with less than 20 compounds.

Holl states that any single district, whose territorial extent varied between 33 km² to 1410 km², included three portions of the landscape, contained the following: (1) the sandy lowland at the foot of the escarpment with its potential for dry season socioeconomic activities (rank 3 settlements: herding; trade; crafts; agriculture); (2) the optimal zone (rank 1 and rank 2 settlements: administration; trade; crafts; herding; warfare), and (3) the hinterland, or periphery (rank 4 settlements: farming; hunting; gathering). Each district center had varying numbers of dependent hamlets, but only three had subordinate villages (Holl 1985; Holl 1993). As an organizing focus of a tributary formation, the regional center would have represented a concentration of power and wealth.

As a centralized political space, by 1200 B.C.(?), the Tichitt-Walata complex was organized around the circulation and redistribution of social surpluses. Hamlets and villages would have provided tribute in the form of agricultural produce and villages and district centers would have provided tribute in the form of livestock and craft goods (Munson 1980; Holl 1985; Holl 1993; Vernet 1993, chapter 3; MacDonald 1996). The centralization of surplus took the form of tribute (tax), and the institutionalization of this practice can appropriately be termed a "tributary revolution." Accompanying these developments was a complex process of peasantization and cultural and social differentiation. Through what he calls the "space allocation system", Holl recognizes differential spatial organization at the different levels of the settlement hierarchy, for example, relationship of private space (habitation units) and public space (alleyways, streets, tombs, livestock pens, and squares) (Holl 1993; Vernet 1993: 273, 304, 306; Vernet 1996). Compounds varied in size and had various architectural features. There were public structures such as watchtowers and fortified and non-fortified access ramps that led to the main entrance of the settlements. Just as there was a clear economic and social organization of space within compounds, there was economic and spatial differentiation among the settlements.

At one fortified district-center (Akreijit: 15 ha. with 177 compounds) certain compounds show a range of domestic tools for different kinds of household and extra-household activities. One compound, for example, had seven grindstones, a grooved stone, a needle, a pendant, 24 axes, two borers, four arrowheads, and so on. Presumably, a family group used these items in its daily

Figure 6 – Saharan & Sudanic Interacting Networks (c. 6th c. BC–c. 6th c. AD)



Adapted from Liverani 2000a

routines. Compounds with similar tools and implements were commonplace. However, other compounds much larger than household compounds were meant for penning livestock. Still other compounds functioned as workshops devoted to particular craft activities. The town of Akreijit had a compound-workshop that produced scrapers. The village of Dakhlet el Atrouss II (10.7 ha. with 49 compounds) had a particularly large compound-workshop that produced arrows, and at Imdel el Abiod, a fortified district center, there were a number of compound-workshops that specialized in the production of quartz beads. At Aouinet Enji, another fortified settlement, several compound-workshops produced arrowheads. Archaeologists have identified Zig, a fortified settlement and possibly a regional center (with several hundred compounds), either as an atelier for the production of grindstones or as a place where they were used in different specialized activities. This place also seems to have been a trading center (Mauny 1950: 36, 37, 38, 39; Vernet 1993: 277–83). Craft specialization was carried out in particular compounds in all settlements, with the exception of hamlets.

The Tichitt Tradition complex entered a period of crisis beginning around 600 B.C. and continuing until 300 B.C., although some settlements and cul-

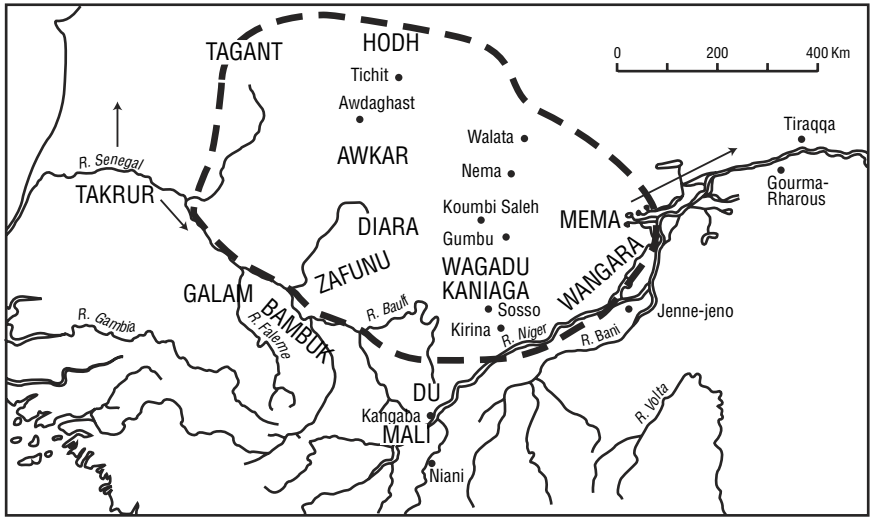
tural elements survived until the 4th century A.D. The decline of architectural, lithic, and ceramic standards is evident in the archaeological record, and the settlement patterns changed as towns were abandoned and villages became concealed and fortified. Urbanism and surplus centralization based on the Tichitt Tradition's hierarchy of clustered compound-settlements was coming to an end. Increasingly arid conditions certainly contributed to this situation, but more important were military forays from the east and north, since these were likely to have disrupted the regional centers' control over trade routes. The Central Saharan-based Garamantes Kingdom/Federation—an emergent tributary system representing a new space of surplus appropriation and centralization—was expanding in this period, and it is likely that a military force from this polity temporarily occupied the Tichitt area (cf. El-Rashdy 1986; see Figure 6). However, the contact was not only military. There were important cultural and material changes. For example, horse-and ox-drawn chariots, depicted in numerous rock art images, and writing, in either the tifinagh and/or Old Saharan scripts, appeared for the first time. The Garamantes, or Libyco-Berbers in the archaeological literature, are believed to have been responsible for these developments (Lambert 1970; Lambert 1981; Mauny 1971: 83–84; Munson 1980; Vernet 1993: 306–07, 322–25; Grebenart 1996: 76–77, 79; Liverani 2000a; Liverani 2000b).

The situation of the western Dhar Tagant settlements was different. This complex had more than 300 dry-stone settlements, which, in terms of their architecture, material culture, settlement differentiation and hierarchies, specialized production systems, and so on, were practically the same as the settlements of the Tichitt-Walata escarpments. The two social formations belonged to the same processes of historical development. The Tagant towns and villages survived the Garamantes assault and the ecological degradation. It is not known what exchange relations—commercial, political, and/or cultural—were established with the Garamantes Kingdom/Federation, but one can assume that different kinds of exchange were initiated and maintained. According to recent archaeological investigations, the raison d'être of the Garamantes system was the production and export of salt to the MNV and the Lake Chad basin (Liverani 2000a). No doubt, the Tagant complex was part of this network. From the 2nd century B.C. to the 2nd century A.D. the complex developed and maintained an important iron working industry. Surveys of many sites reveal evidence of iron production, and surface collections have led to the finding of great numbers of iron fragments. The Tagant settlements had close ties to the lands to the immediate south, where the Ghana/Wagadu tributary formation would emerge (3rd–2nd centuries B.C.?) and the great trading center of Tegdaoust/Awdaghast would develop (3rd–4th centuries A.D.?) (Vernet 1993: 306–07,

340–41). Somewhat later the Anbiya/Sanhaja formation was founded (pre-8th century A.D.) with Tegdaoust/Awdaghast as its capital. The substantive nature of the connections between the Ghana/Wagadu heartland and the Tagant settlement hierarchies remains unclear (Khattar 1996). What is clear, however, is that the social division of labor and the productive forces of the Tichitt and Tagant Traditions produced integrated landscapes comprising economic and social specialization, hierarchical relationships, and settlement differentiation (cf. McIntosh 1998: 55–57). Both Traditions were embedded in interaction networks (BGNs and PGNs) that extended across the Sahara and to the MNV and the SV. Together, they were a historical substratum in the development of the Western Sudan world-system. The Ghana/Wagadu formation "inherited" the hierarchical and other forms of power organization that characterized the Tichitt and the Tagant Traditions. The emergence of Ghana/Wagadu represents a shift of the center of gravity of wealth and military-political power from the WS to the WSa and the western MNV. It also represents a shift in the nature of urbanism—from the town as a center of clustered and specialized compounds to the town as the center of a complex of clustered and specialized communities.

Urbanism in the Mema district, the Upper Inland Delta, and the WSa (especially the Awkar and Hodh districts) was structurally tied to the urbanism of the Tichitt Tradition. That is to say, urbanism in Mema and Macina would not have been what it was without the Tichitt Tradition. The earliest archaeological evidence for towns in the Middle Niger floodplain points to the early first millennium B.C., a few hundred years after the first towns appeared in the WS escarpments. Douentza and Dia are two floodplain sites on opposite sides of the Niger. The first was founded in the 10th century B.C. and the second in the 9th or 8th—an A-phase expansion period (1000–800 B.C.) at the oikumene level. The large tumuli at Douentza have been dated to 900–600 B.C., and in relation to smaller tumuli, they suggest an organized social and political hierarchy and an organization of clustered settlements. By the 5th century B.C. Dia exceeded 100 hectares in area, and in its hinterland were numerous satellite settlements (Bedaux et al 2001; cf. McIntosh 1998: 223; MacDonald 1998: 87–91; see also Ilevbare 1986: 183–84). Following the range of population estimates for Jenne-Jeno (see above), one might suggest that the number of its inhabitants (excluding the population of the clustered settlements) fell between 14,600 (146 persons per ha.) and 38,900 (389 persons per ha.). Between 750/800 and 1150/1200 there was an intensification of urbanism in the MNV as site densities in the MNV floodplain achieved their maximum development.

Figure 7 – The Ghana/Wagadu Tributary System (10th – 11th c.)



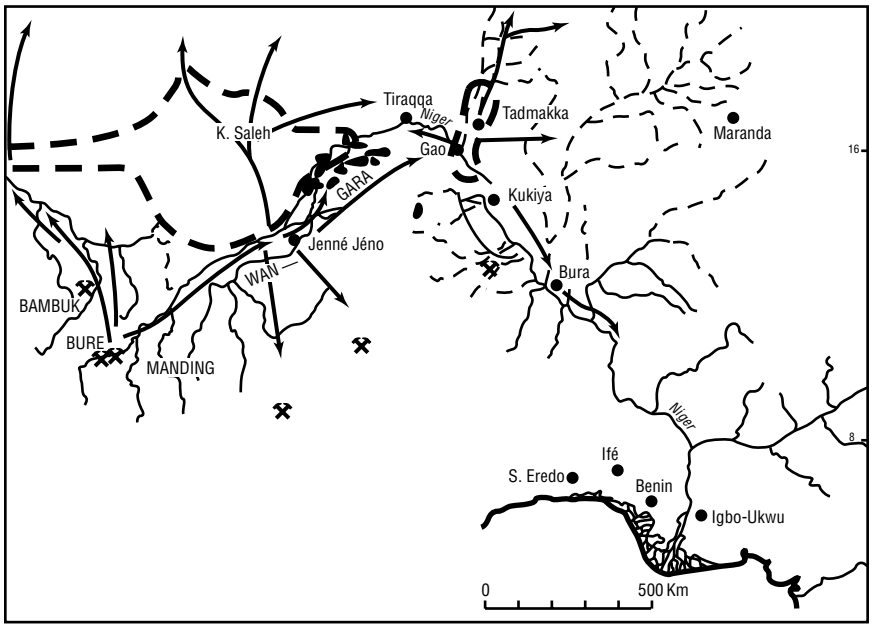
Adapted from Hogben and Kirk-Greene 1966

The Ghana/Wagadu Heartland

The historical importance of the Tichitt-Tagant complex and the Mema district derives from the development of the Ghana/Wagadu state organization in the area, probably between the 2nd century B.C. and the 2nd century A.D. Together with the Hodh and Awkar districts, they formed the kingdom's heartland for more than a thousand years (see Figure 7) (cf. Robert-Chaleix 1989: 264). With a few exceptions, the first millennium A.D. was a time of fairly continuous and occasionally dramatic expansion—cultural, demographic, political, and economic—in the Ghana/Wagadu system. Expansion was tied to the military and political consolidation of the system in its struggles with the Kawkaw/Gao formation, on the one hand, and the Anbiya/Sanhaja formation in the WS, on the other.

According to the astronomer al-Fazari, a late 8th century source, the administration of Ghana/Wagadu was 2,000 kilometers long and 160 kilometers wide. It was a place of great riches. Al-Fazari calls it "the land of gold." The encyclopaedist and geographer al-Hamdani (d. 945) states that "the richest gold mine on earth is that of Ghana in the land of the Maghrib." The geographer and traveler ibn Hawqal (fl. 960s–80s) has the following observation. "Ghana is the wealthiest king on the face of the earth because of his treasures and stocks of gold extracted in olden times for his predecessors and himself" (Pingree 1970:117; Levtzion and Hopkins 2000: 29, 49; also Blanchard 2001). It is worth pointing out that from the 10th century al-Andalus had its wealth and

Figure 8 – Ghana/Wagadu and Kawkaw/Gao zones of control, gold producing areas, interaction networks and Lower Niger basin centers (8th–12th c.)



Adapted from *Vallées de Niger,* 1993

presence as a terminus, or end point, of gold routes from the Western Sudan world-system. The cities of Andalusia were, in effect, something like (northern) port cities for the world-system's PGNs (Glick 1979: 20, 49, 50, 70, 125, 129; *Vallées du Niger* 1993 passim; Spufford 1993: 164, 166–67). The gold came from Upper Niger and Upper Senegal Valley mining communities, which functioned as periphery formations within the world-system before the 13th century.

Ghana/Wagadu's domination probably dates from the late 5th or the early 6th century, following the decline and collapse of the Garamantes tributary system between the 4th and the 6th centuries A.D. Between the 6th and the 8th century Ghana/Wagadu expanded, establishing itself as the hegemonic political and commercial formation in the Western Sudan world-system. In the 9th and the first half of the 10th century it was no longer hegemonic; however, it was still a powerful and dominant tributary system, and its trade continued to expand. The rival Kawkaw/Gao tributary organization was dominant during this period and was able to establish its jurisdiction over an extensive area. In the late 10th century Ghana/Wagadu gained control of the important WS trading center Tegdaoust/Awdaghast, formerly the capital of the Sanhaja Federation/Kingdom (8th–10th centuries) (see Figure 8).

The WS formation and its capital would have formed a periphery of the Ghana/Wagadu core zone. By the first half of the 11th century Ghana/Wagadu was once again paramount. By the end of the century it was part of the Almoravid political coalition and through this alliance it established, in the early 12th century according to al-Zuhri (fl. 1130s–40s), suzerainty over Tadmakka, a dependency of Kawkaw/Gao (Robert 1970; Devisse 1988; Levtzion and Hopkins 2000: 21, 35, 98–99).

The Andalusian geographer al-Bakri (d.1094) states that the 11th century rulers of Ghana/Wagadu commanded an army of 200,000 men, 40,000 of whom were archers. It was essentially cavalry-based and the archers were in all likelihood mounted (Levtzion and Hopkins 2001: 81; also Cissé 1998: 93, 104; de Grunne 1980). It ensured the centralization of political power and hence the centralization of surplus. Even if the geographer overstated the army's numerical strength, the numbers nevertheless indicate a demographic order of magnitude that does not refute the archaeological evidence, which, in fact, suggests strong population densities in the Ghana/Wagadu heartland between the 9th and 14th centuries. A further point needs to be made. The maintenance of a cavalry force (military specialists) would have rested on the regular supply of grain for the horses and iron, brass, leather, and other items for the horsemen's equipment (bits, reins, saddles, etc.). These elements, representing secondary distributions of the surplus, required an urban-based commercial economy tied to subordinated communities of food producing and craft specialists.

Al-Bakri gives a description (1068) of the royal capital:

> The city of Ghana consists of two towns situated on a plain. One of these towns, which is inhabited by Muslims, is large and possesses twelve mosques, in one of which they assemble for the Friday prayer. There are salaried imams and muezzins, as well as jurists and scholars. In the environs are wells with sweet water, from which they drink and with which they grow vegetables. The king's town is six miles distant from this one and bears the name Al-Ghaba. Between these two towns there are continuous habitations. The houses of the inhabitants are of stone and acacia wood. The king has a palace and a number of domed buildings all surrounded with an enclosure like a city wall. In the king's town, and not far from his court of justice, is a mosque where the Muslims who arrive at his court pray. Around the king's town are domed buildings and groves and thickets where the sorcerers of these people, men in charge of the religious cult, live…. The king's interpreters, the official in charge of his treasury and the majority of his ministers are Muslims (Levtzion and Hopkins 2000: 80).

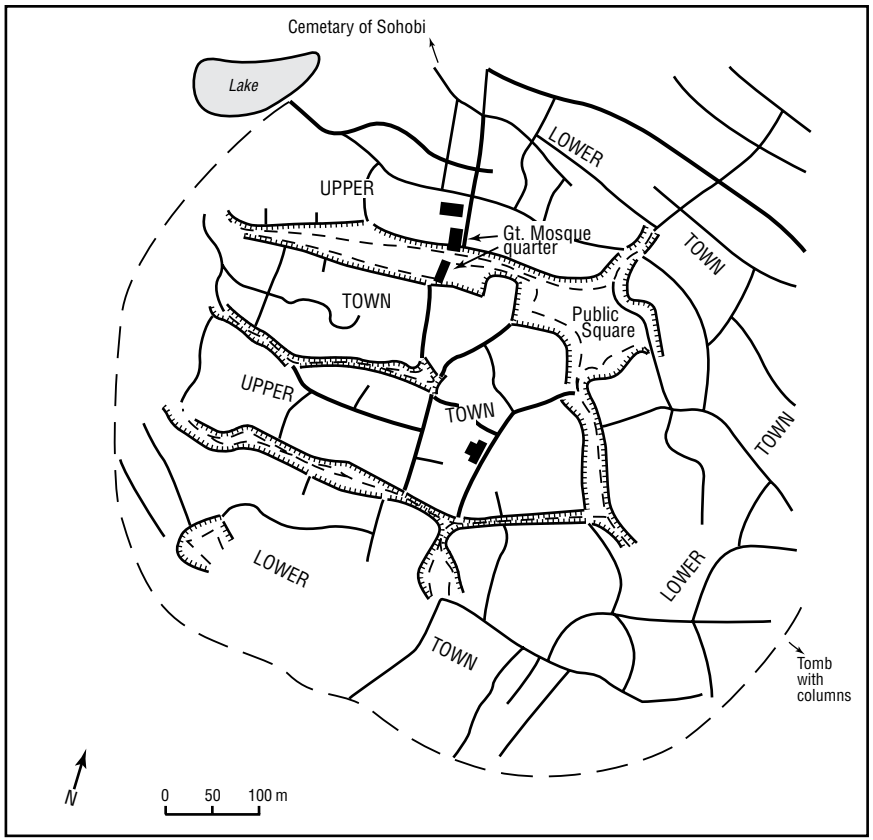
The royal court was opulent with its elaborate ceremonial and rich pageantry, its abundance of luxury goods, gold and silver jewelry, and artifacts. The capital

and royal court benefited from the world-system's polarizing or centralizing processes. That is to say, the existing regime of surplus accumulation enabled the appropriation of social surpluses on a grand scale. It presupposes considerable levels of economic exchange (trade volumes) as well as the systematic and organized extraction of surplus labor (as tribute, taxes, booty, and so on). The trans-Saharan trade—a camel-based distribution and communication system—was of central importance in the intertributary exchanges between Maghribi power and production centers and the Ghana/Wagadu power and production centers (Brett 1969; Devisse 1988; *Vallées du Niger* 1993; Spufford 1993: chapter 7; Levztion and Hopkins 2000: 47–49).

What does archaeology tell us about the capital? Since 1914 fieldwork has focused on a large Sahilian tumulus site known as Koumbi Saleh. Archaeologists generally believe it to be the Muslim and commercial half of the city described by al-Bakri. They have yet to locate and positively identify Al-Ghaba, the royal and administrative half of the capital (Bonnel de Mézières 1914; Thomassey and Mauny 1951; Thomassey and Mauny 1956; Mauny 1967: 72–74, 470–73, 480–82; Mauny 1970: 147–50). The depth of Koumbi Saleh's occupation levels, amounting to tens of meters, represents not only the different stages of successive construction and re-construction of the city but also an antiquity that can probably be traced back to the second half of the first millennium B.C. The lowest levels of the tumulus have yet to be excavated (Thomassey and Mauny 1951; Thomassey and Mauny 1956; Mauny 1967: 72–74, 470–73, 480–82; Mauny 1970:149–50; *Vallées du Niger* 1993:110; Berthier 1997).

A recently published monograph by the French archaeologist Sophie Berthier provides a broad survey of the horizontal (spatial) dimension of the city's hinterland as well as a detailed study of the city's vertical (temporal) dimension. The Koumbi Saleh tumulus has a circumference of 2.4 kilometers and occupies 44 hectares of land. It was formerly surrounded by a wall, most of which is no longer traceable on the ground, but vestiges of its monumental gate are still visible. Remnants of other encircling walls suggest either different stages of fortification development or a city fortified by a double- or triple-wall defense system. Within the walls, the city was densely built up on higher and lower elevations. Archaeologists have identified three principal thoroughfares as well as numerous narrow, straight streets and a large square, which probably served as a market, and many small squares. These public spaces demarcated the sixty blocks of single- and multi-story stone houses on the city's higher elevation. Rows of shops connected to the houses' street fronts opened onto the streets. In this section of the city (measuring 700 by 700 meters) were located the royal palace and the residences of officials and rich merchants. Surrounding the elevated quarters is the city's lower section (measuring 500 by 700 meters).

Figure 9 – General Plan of the Koumbi Saleh Urban Tell



Adapted from Berthier 1997

Its inhabitants would have included craftsmen and other commoners and slaves. Most of the houses were built of mud brick with thatched roofs, but there were also stone dwellings in this sector (see Figure 9).

Berthier provides a helpful chronology and a detailed description of the construction and reconstruction of a large multi-story house (20–21 meters long and 10–11 meters wide) over a period of five centuries in the quarter of the Great (or Friday) Mosque. She does not identify the different occupants of the house during this period, but they were certainly members of prosperous families who would have been wealthy merchants or officials or, possibly, rich artisans. Berthier holds the view that in its evolution the house exemplifies *une urbanization progressive* and that Koumbi Saleh's residential and other buildings represent a distinctive urban architectural style (Berthier 1997; also *Vallées du Niger* 1993: 110, 111).

Berthier identifies two phases of urbanization in the Great Mosque quarter of the city, whose chronology does not correspond to the cyclic phases of the Afro-Eurasian oikumene:

First period of urbanization

Period A, late 9th—late 10th century: building of first houses (stone and mud brick architecture) with clay wall plaques in the late 9th century (previously only wells were to be found on the site); construction of the Great Mosque in the late 10th century; finds in an excavated house included lithic material (e.g., grindstones), local and imported pottery, glassware (including glass weights for weighing gold), a wide variety of beads, copper and iron objects; weaving was practiced; appearance of copper wire currency.

Period B, late 10th—late 11th century: the Great Mosque was enlarged and partly rebuilt; the material culture of the house was the same as in the earlier period except there was a much greater variety of craft goods.

Second period of urbanization

Period C, late 11th –14th century:

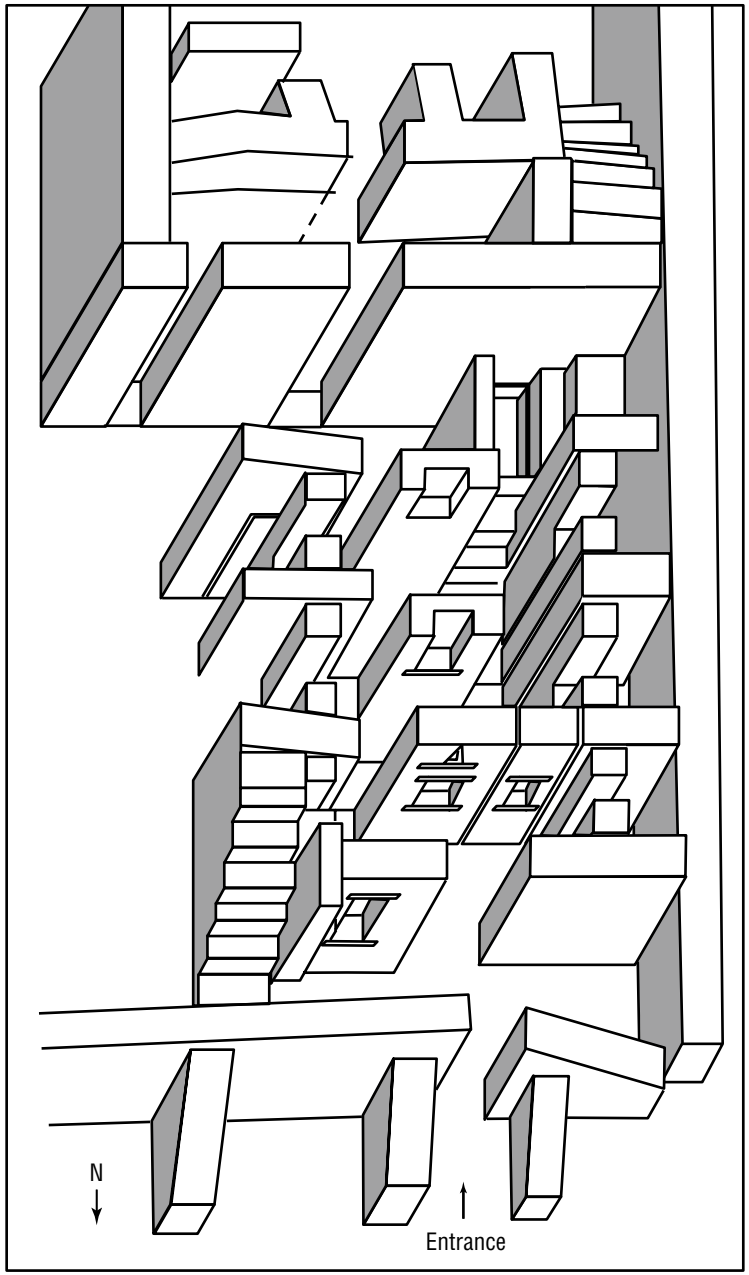
Phase 1, late 11th–12th century: the house was rebuilt with pillars and cesspools (henceforth brick no longer used as the primary material in house construction); the number of people in the house was greater than previously, suggesting to the archaeologist that residential housing in the Great Mosque quarter itself became denser; the material culture of the household was richer, e.g., there were greater quantities of pottery and metalware; new ceramic styles and copper wire currency and glass gold weights were abundant; imports from the central and western Maghrib and al-Andalus were considerable;

Phase 2, 13th century: the Great Mosque enlarged and reconstructed; the house was completely rebuilt with new additions (e.g., compartments) and new architectural features (e.g., rectangular and triangular niches and painted mural plaques); the material culture of the house continued to become more diverse.

Phase 3, 14th century: the last enlargement of the Great Mosque; new additions were made to the house (such as walls, basins, staircases, cesspool, and latrines); the domestic material culture remained rich and diverse.

Period D, in the first half of 15th century: house fell into ruin and the standard of material culture declined; the Great Mosque quarter

Figure 10 – Axiometric plan of an excavated house in the Great Mosque quarter. (12th – 14th c.)



From Berthier 1997

and the rest of the city were abandoned by the middle of the century (*Vallées du Niger* 1993: 111,113, 542, 544; Berthier 1997:12, 102, and passim).

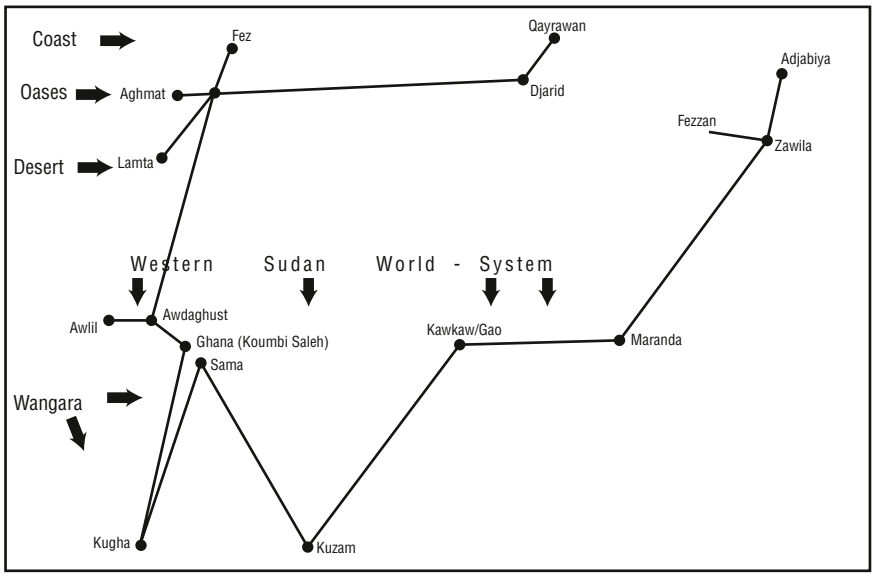
Berthier's chronology is based on the stratigraphy of a single house (see Figure 10) and thus does not refer explicitly to the Great Mosque quarter let alone the entire city. However, on the basis of earlier archaeological studies she is able to make general interpretive statements about the city as a whole, and these are confirmed by 12th and 13th century Maghribi and Andalusian descriptions of the city (Levtzion and Hopkins 2000: 109–10, 152–53).

The occupation of the Great Mosque quarter was continuous from the late 9th to the mid-15th century, a period that overlaps the A- and B-cyclic phases of the Afro-Eurasian oikumene. These centuries were unquestionably a time of considerable prosperity for the city, especially between the late 11th and the late 14th centuries. Berthier considers it the high point of Koumbi Saleh's urban development. Domestic architecture became more elaborate and innovative, yet the principals of construction remained the same. The material culture was abundant, rich, and highly varied, for a tremendous quantity of locally manufactured and imported objects was recovered from the house (Berthier 1997; Thomassey and Mauny 1951; Thomassey and Mauny 1956).

By the early 13th century Koumbi Saleh ceased to be the capital of a large and dominant state system. Newly emergent political organizations appeared—first, the Soso Kingdom (late 12th–13th century) based in the southern WSa and, second, the Mali Empire (13th–15th century), with its heartland centers in the Upper Niger Valley. Ghana/Wagadu became a much-reduced tribute-paying polity, in short a peripheral area, in the 13th and 14th centuries. Nevertheless, Koumbi Saleh continued to prosper as a center of mercantile accumulation within networks of exchange until the early 15th century (for the networks see Hrbek and Devisse 1988: 360; Devisse 1988).

A 250-hectare area just beyond the city walls is covered with ruins. On each side of the city, occupying two km² each, are two immense cemeteries (1,600 by 800 meters and 700 by 400 meters respectively) with "innumerable tombs", and to the south is a monumental, commemorative tomb with columns surrounded by six walls. This structure also functioned as a place of worship. Its architectural parallels can be found in the Ibadi tombs of North Africa and in the Great Mosque of Qayrawan (Ifriqiya). Beyond the cemeteries are the remains of many constructions. They include a series of stone watchtowers, which extend for a distance of eight kilometers beyond the city's fortifications, as well as many clusters of habitations that are probably the ruins of settlements that housed artisans, peasants, herders, royal servants, and soldiers, and also cemeteries,

Figure 11 – Western Sudan interaction networks according to ibn Hawqal's description (10th c.)



Adapted from Devisse 1988

and tumuli. These ruins have not been systematically excavated, hence their dates of construction are not precisely known. Potsherds and artifacts collected on these settlement sites resemble objects recovered from the Koumbi Saleh tell, suggesting that the chronologies of the hinterland settlements and structures and the city are consonant and that they shared the same material culture.

Beyond the immediate hinterland was a distant hinterland that stretched 12 to 22 kilometers beyond the last watchtower. Within this vast area archaeologists have identified numerous large quadrangular structures (caravanserai?) as well as other (unidentified) constructions of different kinds, tumuli, and cemeteries. The material culture and building styles of these sites are the same as the material culture and the architecture of Koumbi Saleh and the sites in its immediate hinterland. The material culture of the hinterland ruins was rich and varied, and the artifacts and constructions provide information about technology, trade, production, the urban economy, and the like (Berthier 1997: 2–3; also Mauny 1970: 147, 149).

Without specifying the city's spatial dimensions, Mauny reckons its 11th century population at 15,000 to 20,000 (based on 177 to 240 inhabitants per ha.). No other archaeologist has ventured an estimate. If the 250-hectare ruin area, just beyond the city walls, were fully occupied, its population range could

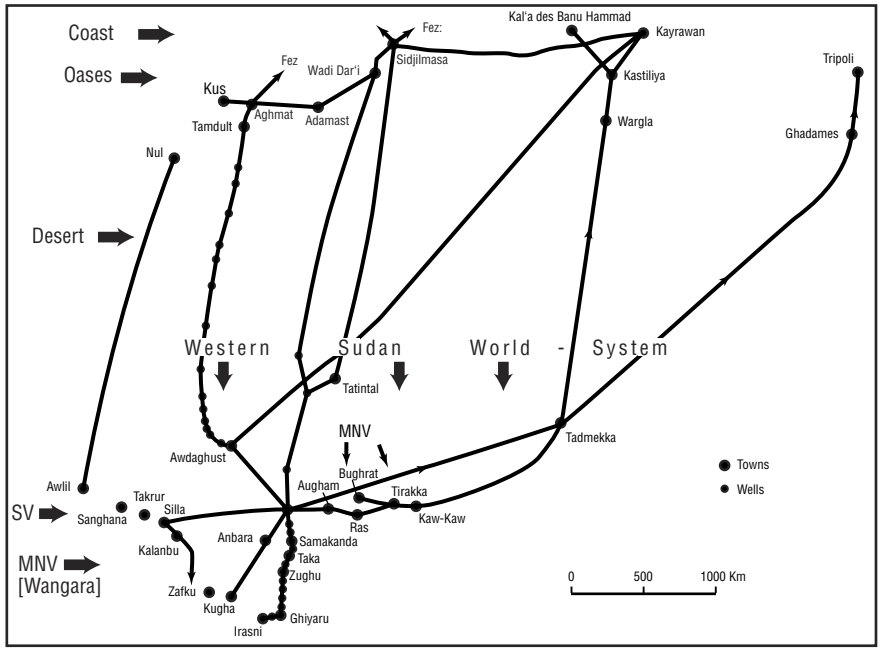
have fallen between 44,250 (177 inhabitants per ha.) and 60,000 (240 inhabitants per ha.) or, to take other ratios, between 36,500 (146 inhabitants per ha.) and 97,250 (389 inhabitants per ha.). The combined population of the city and its immediate hinterland could have ranged between a low of 51,500 and a high of 117,000 residents. Archaeological fieldwork suggests that between the 12th and 14th centuries the different quarters of the walled city were more densely inhabited than they were in the 10th and 11th centuries, hence the number of residents inside the walls could have reached 40,000 or 50,000. The population of the immediate hinterland might have been on the same order of magnitude. The population of the distant hinterland remains unknown (Mauny 1967 p. 482; Mauny 1970: 147, 149; *Vallées du Niger* 1993: 544; Berthier 1997: 1, 3).

Within 30 to 100 kilometers of the Koumbi Saleh ruins are the mounds and tumuli of other urban sites. None has been carefully examined by archaeologists. Many of the sites are reportedly of considerable size, but there are no published details about them beyond the general statement that their material culture resembles that of Koumbi Saleh. In their day they would have formed important nodes in the dense interacting networks of the Ghana/Wagadu system. If the ruined sites were simultaneously inhabited between the 9th and 14th centuries, the heartland would have had an enormous population. In light of this possibility, al-Bakri's reference to an army of 200,000 may not have been far off the mark (Bonnel de Mézières 1914; Clapier-Valladon and Clapier-Valladon 1961; Mauny 1967: 72, note 3, 74). There are no population estimates for this vast territory as a whole or any of its urban clusters.

On the northern frontier of the heartland and situated 400 kilometers to the northwest of Koumbi Saleh was the famous caravan-city of Tegdaoust/Awdaghast (see Figure 11). This southern Saharan entrepot was politically incorporated into the Ghana/Wagadu system in the late 10th century and remained within it until the 13th century, except for a brief period in the second half of the 11th century when the Almoravid movement seized control of it.

The incorporation of Tegdaoust/Awdaghast into the Ghana/Wagadu system was part of a wider strategy, the purpose of which was to establish authority over the great Ijil (Idjil) salt mine, several hundred kilometers north of the southern Saharan caravan-city. In his description of this mine, which he calls Tatantal (Tatintal), al-Bakri reports that its salt was transported to Sijilmasa, Ghana/Wagadu, and "other countries of the land of the Sudan. Work there continues uninterruptedly and merchants arrive in a constant stream for it has an enormous production" (see Figure 3 above and Figure 12). One historical tradition relates that servants of the Masna (= Wangara) merchants extracted, transported, and marketed Ijil salt for the ruler of Ghana/Wagadu (McDougall 1983; Robert-Chaleix 1989: 365; Levtzion and Hopkins 2000: 76).

Figure 12 – Western Sudan interaction networks (western part) according to al-Bakri's description (11th c.)



Adapted from Devisse, 1988

As a politically controlled entrepot-city, Tegdaoust/Awdaghast played a key role in the inter-tributary distribution of surplus. From the SV tributary systems it received dried/salted fish, salt, ivory, gold, produce, and craft products, from Koumbi Saleh gold, produce, ivory, craft goods, ebony, shields, leather, and other products, and from the Egyptian, Maghribi, and Andalusian tributary systems copper, brass, silver, textiles, jewelry, glassware, luxury pottery, and so on (Robert 1970; Devisse et al 1983; Devisse 1988; Robert-Chaleix 1989; *Vallées du Niger* 1993; El Ajlaoui 1994; Garenne-Marot 1996; Cornevin 1998:250–53). The historical status of Tegdaoust/Awdaghast was defined by its relationship to the Ghana/Wagadu heartland and the Anbiya/Sanhaja organization. It served as the capital of the latter (8th–10th century), but in relation to the former it was a periphery. When it became a political dependency of Ghana/Wagadu in the late 10th century, it became the northernmost extension of that formation's heartland. The Saharan Tatantal/Ijil salt mine would have been Ghana/Wagadu's northernmost periphery (Robert 1970; Vanacker 1979; Devisse et al 1983; Polet 1985; Robert-Chaleix 1989).

Archaeological fieldwork on the ruined site of Tegdaoust/Awdaghast in the

1960s and the 1970s has provided a wealth of information about its evolution and material culture. The tumulus exceeds seven meters in height, indicating a lengthy period of occupation. The city was founded well before the 6th century A.D., but, as the lowest occupational levels have not been studied, the exact date of its earliest settlement has not been ascertained (Robert 1970; Devisse 1988 passim). So far, seven occupational levels have been identified, beginning with what archaeologists designate a "period of expansion" (7th century). A period of decline is evident in the late 13th century.

Level 1, 7th–8th century: mud brick housing predominates and the first stone buildings were constructed; metal working (particularly in iron, copper, and gold) and local pottery production were important; glazed pottery imported from the Maghrib appeared in great quantity; Kharijite (Ibadi) traders in residence.

Level 2, 9th–late 10th century: in the second half of the 10th century the town is reorganized with the laying out of streets and public squares; an artisans' quarter is organized; multi-story stone houses built around courtyards appear in the upper town; luxury goods from the eastern and central Maghrib were imported in huge quantities (glazed pottery of all kinds, glassware, jewelry in gold, silver, copper, brass, and semi-precious stones); the metal working and the pottery industries flourished; beginning of glass bead production.

Level 3, late 10th–11th century: multi-story stone houses continue to be built but their architectural styles are transformed; crafts (e.g., weaving, metalworking, bead and pottery making, and leather working) are carried out on a huge scale in the artisans' quarter; glass weights were common and gold ingots were cast; deforestation is evident by the first half of the 11th century; part of the city, in particular the artisans' quarter, was destroyed by the Almoravids (1054) and was partially abandoned; imports from the Maghrib and al-Andalus remained constant.

Level 4, 12th–13th century: the artisans' quarter was reorganized on a smaller scale; glass bead production prospered until the end of the 12th century; metal working activity declined significantly but the production of pottery and leatherware continued unabated and flourished; new pottery patterns were introduced; quality of domestic architecture changed (latrines introduced; interior of stone houses painted); a small mosque was built in the 13th century; imports from the Maghrib and al-Andalus continued throughout the period but modestly compared to earlier times, suggesting that traders were bypassing the city.

Level 5, 14th century: the city was largely abandoned

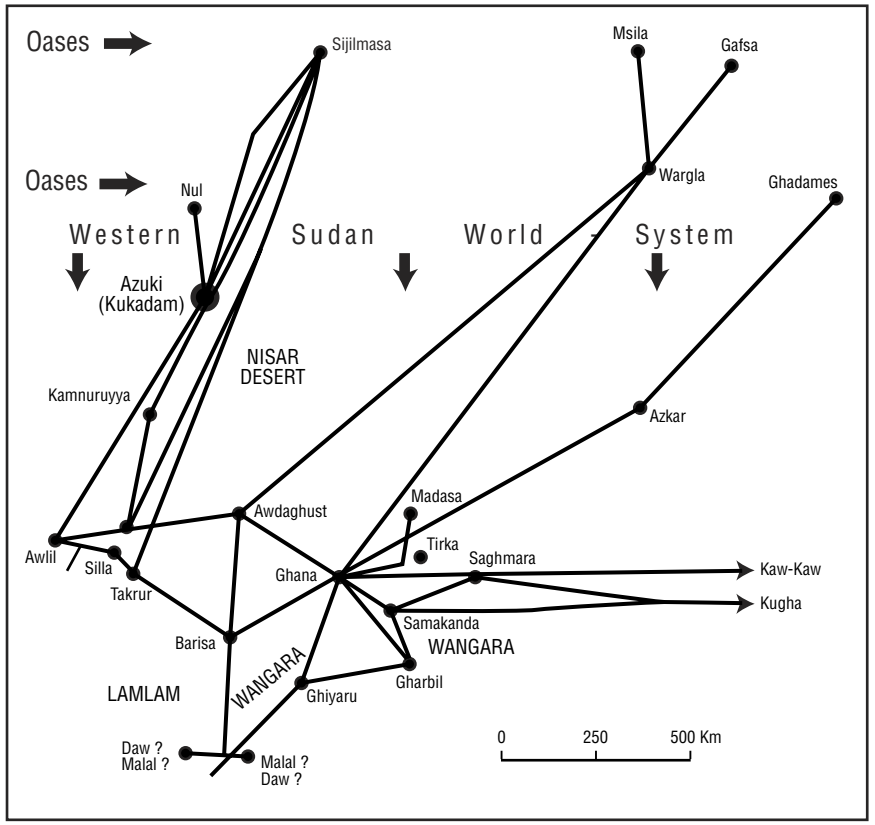
(Robert 1970; Vanacker 1979; Devisse et al 1983; Polet 1985; Devisse 1988; Robert-Chaleix 1989).

The entrepot's domestic architecture resembles that of Koumbi Saleh. Between the 9th and the mid-11th century, changes in architectural style (e.g., the adoption of triangular niches, stone beds, and central pillars or columns) and in craft production techniques (e.g., pottery making and metalworking) paralleled similar developments in Koumbi Saleh. There was an accompanying growth in luxury consumption in the town during this period (Robert 1970: 271; Vanacker 1979: 173, 176; Devisse 1988; Robert-Chaleix 1989: 265–66; Berthier 1997).

The area of stone housing—the upper town—measures 400 by 700 meters or about 12 hectares and represents the central zone of the city. Here were the merchants' and artisans' quarters, where the largest residence, a multi-story structure, measures 40 by 40 meters. In the 9th–11th century period the resident population of this section of the city is believed to have ranged between 3,000 and 7,000. Another estimate, based on a site size of 25 hectares, places the resident population at 5,000–6,000, or about 200 inhabitants per hectare, for the middle of the 11th century. There are no estimates of the much bigger area of mud brick buildings—the lower town—that extend well beyond the stone ruins. The numerical range of the entire resident population was, perhaps, between 10,000 and 20,000 (Mauny 1967:71–72, 474, 482–83; Mauny 1970:151–54; Robert 1970).

A huge prayer ground, measuring 74 by 24 meters, is located 500 meters beyond the stone ruins. It probably dates from the 10th century. Two kilometers from the city is a particularly large cemetery, measuring 900 by 300 meters. Like the cemeteries of Koumbi Saleh, it has groups of tombs enclosed within stone walls. Beyond the cemetery, there are several large structures that archaeologists believe were used to store agricultural produce for the needs of the city's resident population, merchant caravans, and transhumant camel pastoralists. The produce was most likely imported from the SV, although some probably came from the MNV. Beyond the produce storage facilities are the ruins of numerous settlements; however, since they have not been excavated, little is known about their functions and inhabitants. Population estimates for the Tegdaoust/Awdaghast hinterland are not available, but a conservative guess of 5,000 to 8,000 inhabitants might be proposed (Robert 1970; Robert et al 1970; Vanacker 1979; Polet 1985; Robert-Chaleix 1989; Cornevin 1998: 250–53). The city remained an important re-distribution center in the Ghana/Wagadu tributary system umtil the late 13th century, in spite of the rise of another center several hundred kilometers to the northwest. The rival was Azuggi or Azukki (also

Figure 13 – Western Sudan interaction networks according to al-Idrisi's description (12th c.)



Adapted from Devisse, 1988

known as Kakadam or Kukadam) (see Figure 3 above and Figure 13). A faction of the Almoravids turned the town into a fortress-city in the second half of the 11th century. In the 12th and 13th centuries it functioned as a thriving caravan-city on a major trans-Saharan trade route, the Triq Lamtuna (see below). It served as an indispensable halting-place for caravans traveling from the Maghrib al-Aqsa to Ghana/Wagadu and the SV (Farias 1967: 852–54; Cheikh and Saison 1985: 302–03; Levtzion and Hopkins 2000: 73, 128).

Located southwest of the Koumbi Saleh complex in the Upper Niger Delta, the Mema district (see Figure 7 above) was of particular importance in the history of Ghana/Wagadu (Togola 1996: 95–96). Covering an area of 24,000 km², the Mema basin is of interest from several points of view. Today it is semiarid, sparsely inhabited steppe land with extensive traces of ancient settlement, such

as large habitation mounds, ancient fields, and huge slagheaps from iron production. Clearly, the district supported a much larger population in the past than it does today. In the first millennium A.D. it was covered with a dense network of watercourses, and several major trade routes passed through it (Szumowski 1957; Håland 1980; Raimbault and Togola 1991; McIntosh 1998). In a description of the district's pre–10th century settlement history, an archaeologist, Kevin MacDonald, remarked that the "high point of Middle Niger civilization in terms of maximum settlement growth would date to the period between 400 and 800 [A.D.]" (MacDonald n.d.). How is settlement development on this scale to be explained? Or differently phrased, what movement of society and history led to maximum expansion of settlement formation in the Mema district? One response is to interpret settlement expansion as one of the material and social effects of the polarizing tendencies that existed within the Western Sudan world-system as a whole and specifically within the Ghana/Wagadu organization. The centralized authority of Ghana/Wagadu would have generated polarizing processes across the Mema landscape where it concentrated surplus in urban clusters in the form of tribute/tax (on production and trade) and circulated it in the form of trading capital. The distribution and accumulation of surplus would have been decisive for the process of urbanization in Mema. The 6th–10th century period marked a time of Ghana/Wagadu military and territorial expansion (e.g., towards the SV) and the growth of Koumbi Saleh and its hinterlands. It was also crucial for Mema's settlement cluster development.

Aerial photography has identified over 250 site complexes in Mema, dating from between 400–1200 A.D. On the basis of this data a regional survey of the district's western section was carried out in the 1990s. The survey area measured 25 x 50 kilometers and included 137 sites, 109 of which are Iron Age sites. Of these, 94 were habitation settlements and 15 were specialized iron-producing sites. Over 75 % of the sites are located in 13 clusters, or groups of settlement sites. The evidence suggests that Mema was a major production space and one of the key points in the Ghana/Wagadu network of exchanges and surplus transfers (Togola 1996). The survey shows that clusters in western Mema assumed two specific forms in the first millennium A.D.:

Early phase, 5th–7th century A.D.; many small, clustered sites less than 1 hectare in area (averaging fewer than 300 inhabitants per settlement); they represent specialist communities—farming, fishing, herding, and crafts; no single settlement was nodal and dominant.

Middle phase, 7th–14th century; site size was generally 10–20 hectares (averaging more than 2,000 inhabitants per settlement) and in some cases reaching more than 80 hectares (with a possible population peak at more than 30,000); 700–1100 was a time of population growth and urbanization.

In the early phase, different occupational specialist groups occupied specific sites within clusters of villages and hamlets. There were no towns and the area probably functioned as a rural periphery of the Koumbi Saleh complex, on the one hand, and an urbanized eastern and northern Mema, on the other. In the middle phase the rural hinterland became urbanized. This was not only a time of favorable rainfall (lasting up to ca.1100), it was also a time when the Ghana/Wagadu tributary organization expanded militarily, thereby creating more tribute-paying areas which remained dependent until the early 13th century. Western Mema's urbanization phase coincided with the two major phases of urbanization in Koumbi Saleh's Great Mosque quarter and in this period certain social-political groups and settlements became agents in the surplus appropriating and centralizing process. From the 7th century until the 14th western Mema developed a number of large urban clusters. Among the residents would have been commodity-producing craftsmen, Wangara merchants organized in corporate groups, and political-military functionaries (Szumowski 1957; Raimbault and Togola 1991: 368–70; Togola 1996). One can therefore assume that in the middle phase of the district's history a considerable portion of the social surplus was realized as trading capital. Two factors would seem to have accounted for this. The web of economic exchanges was denser from the 7th century onwards and in consequence the scale of surplus transfers distributed through these exchanges assumed a different order of magnitude (cf. Devisse 1988). Furthermore, western Mema was a central location in the network of expanding BGN and PGN exchanges of produce, raw materials, craft goods, livestock, fish and fish products, salt, gold, copper, brass, metalware, etc.

Historical conditions were rather different in northern and eastern Mema. Here, the earliest phase of town building spans the end of the first millennium B.C. and the beginning of the first millennium A.D. A second urbanizing phase dates from 700 to 1100, roughly coinciding with the first phase of urbanism in western Mema. Second phase urban settlements in northern and eastern Mema, some of which were well over 80 hectares in area and could have ranged in population size from 11,000 to 43,000, show, characteristically, a tendency to cluster. The iron smelting industry achieved peak production throughout the entire district between the 8th and 12th centuries. By 1300 rural settlements in northern and eastern Mema were no longer inhabited, and some towns were abandoned altogether, although in western Mema urban centers continued to flourish through the 14th century. The transformation of the district's eastern and northern settlement patterns has been ascribed to several factors:

(1) increasing aridity due to a change in the flow of the Niger and the drying up of the basin's tributaries and watercourses;

(2) deforestation due to massive and intensive iron and pottery production over a period of more than four centuries;

(3) political upheavals traceable to the 13th century conquests of the imperial Mali tributary system;

(4) the voluntary (or involuntary) movement of people to Koumbi Saleh and its hinterlands between the late 11th and the 14th centuries (Håland 1980; Raimbault and Sanogo 1991: 322–23; McIntosh 1995, chapter 10; Togola 1996; McIntosh 1998: 202 and chapters 8 and 10).

In the mid-14th century, western Mema still possessed a few large cities, but, for the most part, they lacked clustered settlements and had rural hinterlands less populated than in previous centuries (Raimbault and Togola 1991: 85). The cities depended directly on craft production and long-distance trade (PGNs) for their prosperity and are indicative of another stage of socio-political and demographic organization in the urbanized Ghana/Wagadu heartland, which enjoyed its most flourishing period between the late 11th and the early 15th century.

Péhé (7th–14th century), Kolima (7th–14th century), Akumbu (4th–12th century), and Toladie (5th–14th century) are among the largest of Mema's clustered settlement sites, each being over 80 hectares in territorial extent, excluding the contiguous satellite settlements and the huge funerary tumuli, some of which were surrounded by habitation sites. Thus, in area each is twice the size of the walled quarters of Koumbi Saleh. The economies of these centers were tied to iron production—the sites had extensive remains of iron smelting furnaces—and long-distance trade (see Figures 11, 12 and 13 above). Located along a large (now dry) tributary of the Niger, Péhé's mounds, four to eight meters in height, occupy an area 1,000 meters in length and 700 meters wide. Archaeological finds in the Péhé, Kolima, and Akunbu tumuli include the following: terracotta statuettes of armed horsemen, cowrie shells (imported from the Indian Ocean and used as a local currency), iron lance heads, copper and bronze objects (e.g., bracelets, rings, and trinkets), spindle whorls (implements in textile production), a rich variety of local and imported utilitarian and luxury ceramics (including enamelware, painted pottery, and multi-legged vases), beads of all sorts (e.g., glass and semi-precious stones), and curvilinear and rectilinear buildings. The inhabitants were clearly involved in BGNs and PGNs (including the trans-Saharan trade) and they maintained craft industries on a very big scale (Szumowski 1957: 224–48; Mauny 1967: 97–100, 103–04; Raimbault and Togola 1991; McIntosh 1995, chapter 10; Togola 1996; McIntosh 1998, chapter 8).

The material culture of the urban sites reflects the intensification of craft and commercial activity in the Mema district that occurred between 600 and 1100.

For more than 200 years Mema was the most important iron-producing locality in Ghana/Wagadu. Archaeologists have located thousands of iron-smelting furnaces. Iron production between the early 8th and the late 11th centuries was on too great a scale for local requirements only. The producers were obviously engaged in commodity production for distant markets such as Saharan oasis towns. Mema's annual iron trade—in bloom, ingots, and artifacts—must have been enormous; however, archaeologists have yet to offer any quantitative estimates. Mema possessed no iron ore deposits, and hence mining was not carried out there. Iron was imported in the form of bloom or ingot. The sources of the iron ore remain unknown, but they were probably located well to the south of the district.

The magnitude of craft and agricultural production and the intensity of the interacting networks led to the flowering of a mercantile-tributary social system in Mema's urban clusters. A mercantile dynamic can be seen in the activities of the gold trading merchants known as the Wangara. They dominated the mercantile handling of the social surpluses throughout the period. The social system's central features would have included private property/estates, long-distance trade, commodity production, and the extension of dependent labor in agricultural and craft production (Krueger 1937; Thomassey and Mauny 1951; Thomassey and Mauny 1956; Brett 1969; Lessard 1969; Vanaker 1973; Lacoste 1974; Devisse 1988; El Ajlaoui 1994; Berthier 1997; McIntosh 1998).

The Western Sudan world-system encompassed an immense cultural-ideological area, within which common (non-Islamic) cosmographic, mythic, historical, legendary, and philosophical presuppositions, propositions, and formulations—in short, a state ideology—circulated over a wide expanse, thanks in part to the wide ranging roles of the Wangara in the interaction networks. The state ideology had its roots in the Ghana/Wagadu tributary organization and its historically determined forms of social production. The elaboration of the polity's centralization practices and their expression through a state ideology (e.g., the widespread snake, or serpent, cult) made this process a general model at world-system levels of orientation and understanding—with regard to cosmogony, supernatural forces, human necessity, social hierarchy, and values. This rationality allowed the centralizing process of the tributary system to express awareness of (i.e., to symbolize and represent) itself at different levels of concrete and abstract thought. It generated a macro-regional oriented metaphysics, transcending the horizons of heartland ways of thinking and acting. That is, the Ghana/Wagadu system, as idealized in the lifestyle and ideology of its ruling military aristocracy, was presented at the level of the entire world-

system as a model of social-political (tributary) organization and metaphysical aspiration. In other words, the state society's tributary ideology defined the cultural and geopolitical regions of the Western and Central Sudan world-systems (Monteil 1953; Levtzion 1973:16–19; Gado 1986: 187–90; Phillips 1995: 488–90; Cissé 1998:72–85, 111–20; McIntosh 1998: 26–30, 224–29, 285, 291–92; Togola, n.d.). From the 8th century on the philosophical and religious movement of Islam—in its different institutional expressions—established itself throughout much of this world-system. Evidence of the different forms of Islam is archaeologically identifiable in the architecture and material culture of Koumbi Saleh and Tegdaoust/Awdaghast (*Vallées du Niger* 1993: 113, 542; Berthier 1997). The gradual spread and adoption of Islam "set up" the Ghana/Wagadu tributary organization as a "general system" at the levels of the Western Sudan world-system and Islam of the West (Maghrib) (Monteil 1929; Last 1980; Levtzion and Hopkins 2000, passim).

Ghana/Wagadu and the Middle Niger Valley

Archaeological surveys conducted in 1981 and 1983 brought to light 186 sites in one Lakes Region sector of the MNV. The sites comprise megaliths, fortifications, cemeteries, settlements of different sizes, and metalworking and pottery workshops. The important tumuli range in height from 5 to 15 meters; the more numerous mounds average less than four meters. Some of the Lakes Region sites are quite large, possibly representing urban clusters or large towns, but they were not as larges as the settlements found in Mema. One sizeable Lakes Region complex has fourteen large tumuli, each consisting of not fewer than three mounds. The average distance between each mound is 100 meters. The average length of a mound is 300 meters and the average height ranges from 4 to 10 meters. In one tumulus of more than six mounds, four mounds contain stone structures, evidently buildings of some sort, two mounds were metalworking sites, and still others were graves. Another site complex had nineteen large, contiguous mounds. Some were eight or more meters high; others were very long—up to 300 meters—but low in height. Seven of these mounds reveal structures of fired brick, two were former metalworking sites, five had blocks of sandstone, presumably ruined buildings or megaliths, and four had cemeteries. One particularly large site (Arham-Jeno) occupied an area of 100 hectares (excluding its satellite settlements) and one might propose a population between 14,600 (146 persons per ha.) to 38,600 (389 persons per ha.) for this sizeable town. The most flourishing period for the Lakes Region sites, when the size and density of clustered mounds and tumuli suggests a very large population, was from the 5th to the early 10th century A.D.

Iron production in the Lakes Region also assumed great importance in

the first millennium A.D., especially from the 4th century. Archaeological surveys have revealed that every ancient habitation site—and there are hundreds of sites—showed vestiges of metallurgical activity and numerous other sites that were not habitation settlements were devoted solely to iron production. In their day the smelting furnaces apparently numbered in the thousands. Archaeologists have identified four different kinds of smelting furnaces, each representing different smelting techniques and capabilities. The sheer magnitude of Lakes Region metallurgical activity meant that production was not solely meant for the needs of local agriculture but was most likely intended for markets near and far (Chieze 1991). On the one hand, iron production in Mema and the Lakes Region grew under the direct and indirect effects of large-scale commerce—at both bulk goods and prestige goods levels of exchange—and, on the other hand, it reflected the scale of secondary distributions of the surplus within the Ghana/Wagadu system.

Between the 7th and the 11th centuries elite burial mounds were raised throughout the MNV, but there was a particular concentration of them in the Lakes Region, which seems to have been a site for grand construction projects since the 6th century A.D. Most of the funerary monuments in the Lakes Region were built in the 10th and 11th centuries, overlapping wet and dry climatic phases and A- and B-phases of oikumene expansion and crisis. Archaeologists associate these structures with the Ghana/Wagadu ruling classes. Most of the great tombs, which reach heights of 10–18 meters, were circumscribed by circular or semi-circular clusters of habitation and metalworking sites (principally iron and copper), dressed and undressed sandstone megaliths, and low burial mounds. They stretched along an east-west axis on the floodplain. Their grave-goods indicate, as one archaeologist phrased it, "an unusual level of wealth." Excavated tombs contained huge quantities of glazed and painted pottery, spindle whorls, human and animal figurines of copper, bronze, and terra cotta, as well as copper, bronze, and iron tools, weapons, and jewelry, beads and necklaces of semi-precious stones (marble, agate, cornelian, rock crystal, and garnet), flint, glass, and terra cotta (Connah 2001: 127; also Desplagnes 1903; Desplagnes 1951; McIntosh 1998: 223–27).

A related phase of construction involved the raising of several hundred dressed sandstone megaliths, which range two to three meters in height. The megalith period fell between ca. 500 and ca.1000 A.D. The megaliths formed distinct groups, separate from the megaliths surrounding the monumental tombs. The Tondidaro site consisted of three dressed-stone alignments (of 150, 50, and 30 stones respectively), two single monoliths, and two funerary mounds. The site is dated to the 7th century (Fontes et al 1991; Dembélé 1991a; Dembélé 1991b; Sidibé 1991; Person et al 1991; McIntosh 1995, chapter 10; McIntosh 1998:

190–99, 219–30; Connah 2001:127, 130, 136, 138). The great quantity and variety of objects found on different sites in the Lakes Region suggest that among the population were artisans (e.g., smiths, weavers, potters, and stone cutters), fishermen, herders, peasants, soldiers, and merchants. In their midst, the monumental tombs and the megalith clusters would have served as both material manifestations and ideational mediations of the Ghana/Wagadu state ideology. They represent, in one sense, the elites' spiritual and symbolic dominance over "a network of [secret] power localities" and "the occult forces created within the sacred landscape." They would have served as markers of a sacred geography and a spiritual cosmology (Desplagnes 1903; McIntosh 1998: 27–30; cf. Cissé 1998: 72–85; Levtzion and Hopkins 2000: 80–81).

In the 11th and 12th centuries there occurred a serious demographic shift in the Lakes Region, following a sharp population decline. Indeed, later generations recalled a distant time when one Lakes Region district (Killi/Kougha) was populous and rich and contained no less than 330 villages, but in the early 20th century there were only 30 (Desplagnes 1903: 155). This social memory recalls the scale of floodplain de-population in the late cluster-settlement period. The causes behind the demographic decline are not really known. Deforestation, due to high volume ceramic and iron production and overgrazing by livestock, has been suggested as a major contributor to desertification (Dembélé 1991a: 65–66; also McIntosh 1998:190–99). Another possible cause pertains to the social dynamic and relations of production of the Ghana/Wagadu heartland and the urban clusters of the Upper Delta. The supposition is that the scale of surplus appropriating and centralizing practices in the heartland required greater transfers of resources (from raw materials to laboring bodies) from the Lower Delta and the Lakes Region to Koumbi Saleh and its hinterlands. The transfers reflected a continued centralization of political power and the reproduction of hierarchy and social difference. The coerced and/or voluntary movement of large numbers of people from various Lakes Region districts to the heartland would have been one manifestation of the polarizing tendencies in the tributary system. The construction of monumental tombs and tomb clusters in an area where population decline was precipitous suggests an affirmation of sovereignty by Ghana/Wagadu political-military authorities. The cultural politics of these iconographic representations produced hierarchical and relational designations that facilitated governance and surplus appropriation. Mercantile accumulation was important in this context. The increasing scale of long-distance trade relations—both Saharan and Sudanic—were directly connected to a second phase of urbanization and population growth (late 11th century on) in the Koumbi Saleh urban complex. Increasing intertributary exchanges and mercantile accumulation would have been a basis for drawing resources, including people, from

the Lakes Region and other parts of the MNV into the heartland. At a world-system level of analysis, these wide-ranging developments cannot be separated from the structures and relationships within which the Almoravid revolution took form (see below).

The various developments in the Ghana/Wagadu state society between the 8th and the 12th centuries have to be understood in terms of the expansion of the productive forces, the changing relations of production, and the distribution patterns of the social surplus within the structures of the tributary organization. The following features can be noted:

(1) increasing social and proprietary stratification organized around ruling militarized groups or Houses that carried titles of honor, conspicuously exemplified in megalith and monumental tomb construction and in the creation of large terra cotta equestrian figures;

(2) the establishment of dependent artisan caste groups, the creation of the Somono occupational group, and the establishment of the royal Zanj institution as part of the central political apparatus;

(3) the large-scale growth of iron production in the Lakes Region and the Mema district (and, later, in the SV) and the growth of agricultural and fishing production in the MNV; the sites of expanded production were market oriented;

(4) urban cluster growth, the intensification of urbanism, and the proliferation of clustered settlement hierarchies in the MNV and the WSa, processes predicated upon the consolidation of mercantile (exchange value) accumulation strategies and the intensification of social surplus extraction;

(5) the military and political extension of the WS periphery into the western Mediterranean basin via the collective agency of the Almoravid project

(Delafosse 1920; Gallais 1962; Mauny 1967: 129–36; Tymowski 1967; Tymowski 1971; Hunwick 1968; Devisse 1988; Fontes et al 1991; Person et al 1991; McIntosh 1995; McIntosh 1998: 219–23; Connah 2001: 127–29; see also Tamari 1991; Barendse 2003).

The power centralizing practices of the ruling dynasty and its adherents carried defining social, cultural, and material traits: monumentalism in architecture, ceremonialism in royal court protocols, and idealization of the horse warrior.

Growth and contraction in the Middle Niger Valley

Power-centralization and militarization cannot be separated from long-

distance exchange networks. The 12th century geographer Al-Idrisi provides an account of the land or island of Wangara, i.e., the floodplain of the MNV, was represented, geographically and cartographically, as the land of gold (see Figures 8, 11, 12, and 13 above). The Wangara were gold merchants and exercised a virtual monopoly of the world-system's gold trade. The geographer al-Idrisi provides pertinent details:

> This country of Wanqara is the country of gold, famous on account of its good quality and abundance. It is an island 300 miles long and 150 miles wide, surrounded by the Nil on all sides during the whole year.... Most of the gold is bought by the people of Warqalan and al-Maghrib al-Aqsa who export it to the mints in their own country, where dinars are struck from it, which they use in trade. Thus it happens every year, and this is the greatest source of income for the Sudan, upon which both great and small depend. In the land of the Wanqara there are flourishing towns and famous strongholds. Its inhabitants are rich, for they possess gold in abundance, and many good things are imported to them from the outermost parts of the earth (Levtzion and Hopkins 2000: 111; also Taylor 1928).

Archaeological investigations in the MNV and in neighboring districts confirm al-Idrisi's description. Excavations of tumuli reveal imports from many distant places, e.g., the Mediterranean world, historic India, and Southeast Asia. They verify that products came to the Western Sudan world-system from the outermost parts of the Earth, not only in the 12th century, but also in the time of Roman and Byzantine dominance in the Mediterranean world (see e.g., Magnavita 2002a; Magnavita 2002b; Magnavita and Pelzer 2000).

Located in the Lakes Region at the eastern end of the "country of Wanqara" was Tiraqqa, a predecessor of Timbuktu. It was one of the great commercial centers of the MNV—a meeting place of caravans from Ghana and Tadmakka in the 10th and 11th centuries—and a dependency of Ghana/Wagadu. Al-Idrisi describes it as "one of the towns of Wanqara"—large, well populated, and unwalled—and relates that it was "subject to the ruler of Ghana, in whose name the *khutba* is delivered, and to whom the people go in litigation" (Levtzion and Hopkins 2000: 111). By this time the Ghana/Wagadu-dominated districts of the Lakes Region were no longer densely settled. Nevertheless Tiraqqa seems to have remained an important mart until the 13th century, at which time Timbuktu replaced it. An early 20th century survey of the presumed Tiraqqa site revealed a central ruin area between one and two kilometers in length and 800 to 900 meters wide. Surrounding it are tumuli scattered over an area of several square kilometers, suggesting that the city formed part of an urban cluster (Bonnel de Mézières 1914–16). No excavations have been carried out on the site, and its identification with Tiraqqa remains problematic.

Between the 12th and 14th centuries, the Wangara extended their trade networks eastwards towards the Lake Chad basin, via the centers of the Kawkaw/Gao tributary system. They also moved several hundred kilometers northwards from Koumbi Saleh into the WS where they established agricultural colonies and fortified oasis towns, which served as caravanserai. Their strategic movements were a response to increased commercial traffic along the WS trade routes. They were, in part, a consequence of Almoravid and Almohade political and social hegemonies and commercial activity in the Maghrib and Andalusia (11th–13th century) and, in part, an effort to consolidate Ghana/Wagadu's political interests in the southern Sahara, interests that predated the 11th century (Mauny 1967: 70; McDougall 1983: 277–78; Last 1985: 171–72, 216–18; Devisse 1988).

The agricultural sectors of the Ghana/Wagadu system changed radically between the 9th and the 13th century, thus overlapping the period of Wangara commercial exapnsion. Transhumant cattle pastoralists moved into the pasture lands above the floodplain and new peasant communities were founded between Mema and the Lakes Region. In the 9th century Soninke-speaking peasants who cultivated millet and sorghum migrated from the WSa to Mema and Macina, where they occupied lands above the floodplain and in the 10th and 11th centuries other cultivators of millet and sorghum arrived, Migrating from the Upper Niger Valley, Bamana-speaking peasants, settled above the MNV floodplain, and in the increasingly arid Mema district (Tymowski 1971). The agriculture of the incoming peasants relied on assartage ("dry-farming") and seasonal rainfall, and not on irrigation and the annual flooding of the Niger. The labor demands of assartage agriculture and floodplain agriculture required different forms of social organization and, in contrast to floodplain cultivation, assartage was closely linked to transhumant cattle herding.

Dry-farming agriculture stimulated the fishing industry and incorporated it into a wider commercial network, e.g., the export of fish and fish products to the Upper Niger gold fields and Saharan oases. The new peasant immigrant groups and cattle-herding pastoralists created a new market for Saharan salt. The Ghana/Wagadu regime made a conscious effort to exploit more effectively the resources of the Niger River—fishing and the hunting of aquatic animals—and the trade in these resources. Thus, in the course of the late 11th and 12th centuries new specialized occupational groups, known collectively as the Somono, were created to exploit the resources of the Niger. Drawn from slaves and war prisoners, they were settled in fishing villages and specialized in river transport, boat building, aquatic hunting, and the production of fish and fish products. The MNV fishing industry supplied rural and urban populations with dried, salted, and smoked fish and fish oil. Somono communities got directly involved

in the Saharan trade in order to purchase salt. The more intensive exploitation of the Niger's resources led to the expansion of the boat building industry. A concomitant development, related to the centralization of dynastic power, concerned the creation of a number of specialized servile groups—including blacksmiths, cultivators, herders, masons, armed retainers, and boatmen—who as royal property were in life-long state service obligations to the kingship. Known collectively as the Zanj, they could be moved from place to place and since they could never be (legally) freed, they were not slaves (Tymowski 1967; Tymowski 1971; Hunwick 1968). On the basis of the Somono-Zanj labor systems the surplus-appropriating classes of Ghana/Wagadu were in a position to maximize their wealth (as surplus product) in stored form, e.g., in monumental constructions, and to valorize it as trading capital, which would support lifestyles of conspicuous consumption.

Changes in production strategies can be linked to the demands of trade. In the 9th century (an oikumene B-phase) the Western Sudan's BGNs extended to the Umayyad Caliphate of al-Andalus. At this time sorghum replaced millet as a staple in the diet of the Caliphate's lower classes. According to Glick, sorghum was "imported from the Sudan, no doubt by Berbers. Sorghum played in al-Andalus the same social and nutritional role as that played by rye in Christian Spain.... The Andalusis imported grain from North Africa from the ninth century on...." He cites ibn Khaldun, who attributes the "good health of Andalusis to their Spartan diet of sorghum and olive oil" (Glick 1979: 81, 82). Likely sources of the sorghum were the floodplains of the MNV and the SV. The export of sorghum occurred during the first urbanization period (9th–10th centuries) of Koumbi Saleh's Great Mosque quarter. How long this trade continued is uncertain, but presumably it lasted as long as the Umayyad Caliphate, which collapsed in the early 11th century. The sorghum trade between the Western Sudan world-system and the Umayyad Caliphate implies the emergence of a single interactive socioeconomic complex, for when considered together with other kinds of exchange (e.g., in metals and cultural artifacts), one can recognize the presence of interacting BNGs and PNGs over a vast distance.

A second commercial-production trend relates to the growth of textile manufacturing in the MNV urban clusters and the Ghana/Wagadu heartland and the growth of a prestige good export to the western Mediterranean basin. The prestige good was a cotton cloth whose export appears to have begun in the second half of the 11th century in the wake of Almoravid military and political expansion into the Maghrib and al-Andalus. Increased cotton production was apparently connected to the occupation of lands above the floodplain. A burgeoning trade in cotton cloth production was undoubtedly connected to the expanding artisanal economy in certain urban clusters, e.g., in the Mema district, and the second urbanization period of the Great Mosque quarter. The earliest documented reference to the cloth comes from a Latin Christian document of the first half of the 12th century (an oikumene A-phase). The cloth was known in Latin Christendom as "bouracan" or "bougran" (from Mande birinkan). There is no clear-cut evidence that it existed earlier than this. In any case, it probably continued through the 14th century and perhaps longer (Nicolas 1958; also Brooks 1998: 150). The intensification of production and exchange in both a bulk good (sorghum) and a prestige good (bouracan cotton cloth) would seem to indicate the importance of particular production and commercial strategies when core areas were undergoing large-scale transformations. Through the interaction networks of the Wangara the production of sorghum and cotton was tied to an inter-continental commercial-monetary system (see below; cf. Barendse 2003).

The continued prosperity of the Ghana/Wagadu heartland and the power consumption of its ruling classes are evident from al-Idrisi's mid-12th century description:

> [The town of Great Ghana] consists of two towns on both banks of the river. This is the greatest of all the towns of the Sudan in respect of area, the most populous, and with the most extensive trade. Prosperous merchants go there from all the surrounding countries and the other countries of al-Maghrib al-Aqsa. Its people are Muslims.... The *khutba* is delivered in [the king's] own name, though he pays allegiance to the 'Abbasid caliph. He has a palace on the bank of the Nil, strongly built and perfectly fortified. His living quarters are decorated with various drawings and paintings, and provided with glass windows. This palace was built in the year 510 of the hijira [1116–17 A.D.]. His kingdom and his land adjoin the land of Wanqara. This is the country of gold, which is [often] mentioned and described as having quantities of it of good quality (Levtzion and Hopkins 2001: 109–10).

The 12th century capital was at the height of its power and wealth (cf. Berthier 1997).

How does Ghana/Wagadu's period of growth, expansion, and contraction compare with the chronology of the Afro-Eurasian oikumene? Frank and Gills identify two A-phases between 700 and 1100 (500–750/800 and 1000/1050–1250/1300) and one B-phase (750/800–1000/1050). Koumbi Saleh flourished and expanded from the 9th to the 14th century, declining only in the first half of the 15th century. The Ghana/Wagadu political organization entered a period of contraction, fragmentation, and decline in the 13th century and in the 14th century was under the suzerainty of the Mali tributary system. The expansion phase of northern and eastern Mema urban history ended in the later 12th century and a crisis phase became evident in the 13th and 14th centuries. In western

Mema large urban centers prospered until the end of the 14th century and the beginning of the early 15th. From the 5th to the 11th century the Lakes Region was populous and prosperous with thriving metallurgical and ceramics industries located in villages and specialized craft communities, sizeable urban clusters that functioned as markets, and large-scale megalith construction. In the 11th and 12th centuries one phase of megalith construction ended and the population declined, but the building of monumental tombs, greater in size than earlier elite graves and surrounded by megaliths, was carried out on an unprecedented scale. There was a complicated pattern of surplus appropriations and re-distributions that cannot be easily designated an A-phase or a B-phase.

An urban cluster: Jenne-Jeno

Two MNV archaeological sites of note are Jenne-Jeno ("ancient Jenne") and Dia (Ja), which lay 100 kilometers to the north of Jenne-Jeno (see Figures 14–18). Both have yielded valuable information and have led archaeologists and historians to revise their understanding of the beginning of city life in the MNV. The growth and development of Jenne-Jeno in the first millennium A.D. is connected to the ancient city of Dia, which was founded in the early first millennium B.C. It was one of the oldest urban cluster formations in the MNV and remained an important center until the 10th or 11th century when most of its satellite settlements were abandoned. The visible archaeology of Dia consists of three huge settlement mounds, which cover an area of more than 100 hectares. The mounds represent the different quarters of the city. It is remembered in oral histories as a city of masons and Muslim jurists (*fuqaha*). Between the 4th and 11th centuries A.D. Dia and Jenne-Jeno formed a single craft-commercial axis in the Upper Niger Delta.

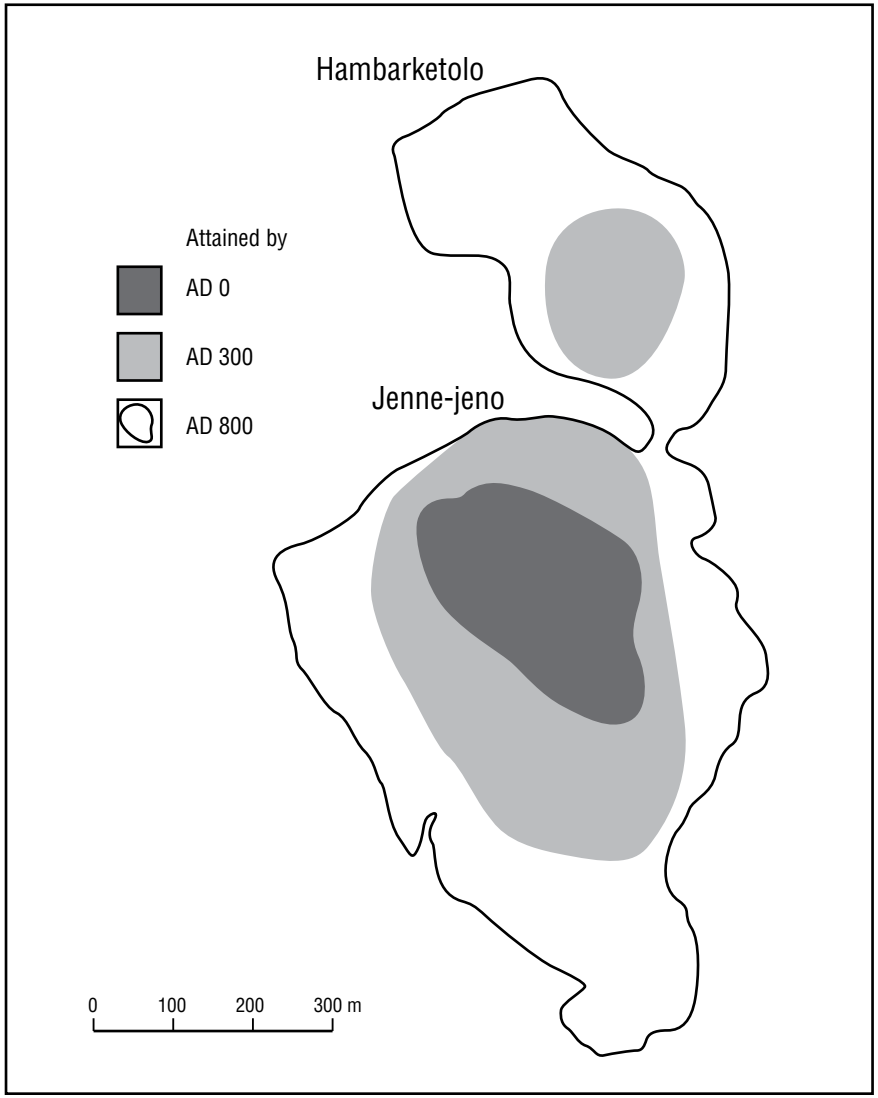
Jenne-Jeno has been the focus of archaeological fieldwork since the 1970s. The chronology of the city covers a period of more than a thousand years (Figure 14).

Phase 1, 250 B.C.—50 A.D., absence of mud brick buildings; 12 hectares in extent by 50 A.D.; iron imported from mining settlements 50 kilometers away.

Phase 2, 50–400, permanent mud brick architecture appeared; expansion of the rice-fish-cattle subsistence complex; 25 hectares in area by the mid-5th century (and with a resident population of between 3,000 and 10,000).

Phase 3, 400–900, a more intensive occupation of the site as a result of an increasing population density (20,000 inhabitants by 500, according to one estimate); there were more houses and crowded cemeteries; from

Figure 14 – Plan of Jenne-Jeno Growth

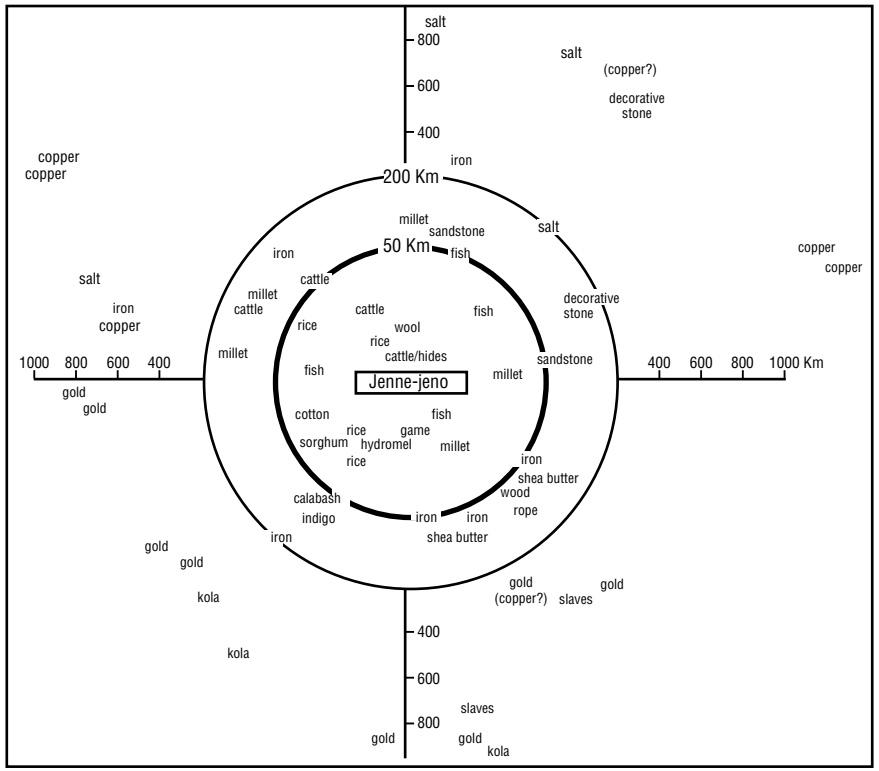


From McIntosh 1995

the 5th century until the 9th round houses were constructed with tauf, or puddle mud, foundations; the city occupied 33 hectares of land by 900; painted pottery was exported 750 kilometers upriver; city wall built (850/900).

Phase 4a, 900–1100, continued building; new technologies (e.g., textile

Figure 15 – Trading spheres of Jenne-Jeno; immediate (0–50 Km); intermediate (50–200 Km); distant (200+ Km)



From McIntosh 1995

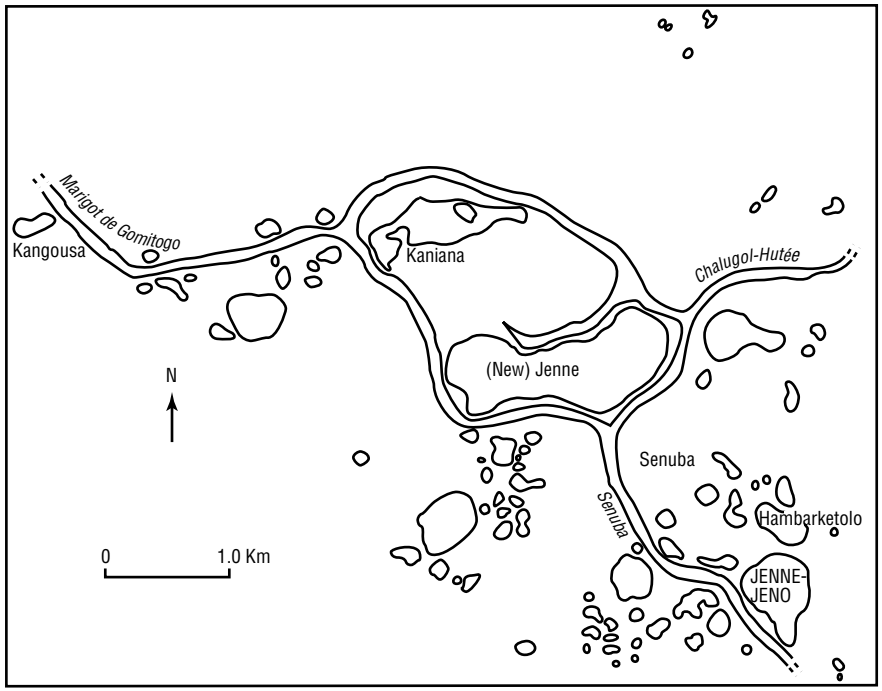
production); pottery with stamped and impressed decorations replaced painted pottery; new architectural styles introduced (e.g., the use of cylindrical and square bricks in building), and new art forms (e.g., terra cotta sculpture).

Phase 4b, 1100–1400, gradual decline of the town—contraction and abandonment

(Macintosh 1995; McIntosh 1998).

Controlled stratigraphic excavations at different places on the site, together with systematic surveys over several square kilometers and intensive surface collection over an even wider area, reveal the evolution of a settlement hierarchy, or a central place formation, with Jenne-Jeno as its focal point. The city had a rich agricultural base, producing rice, sorghum, and millet. Rice was the main staple.

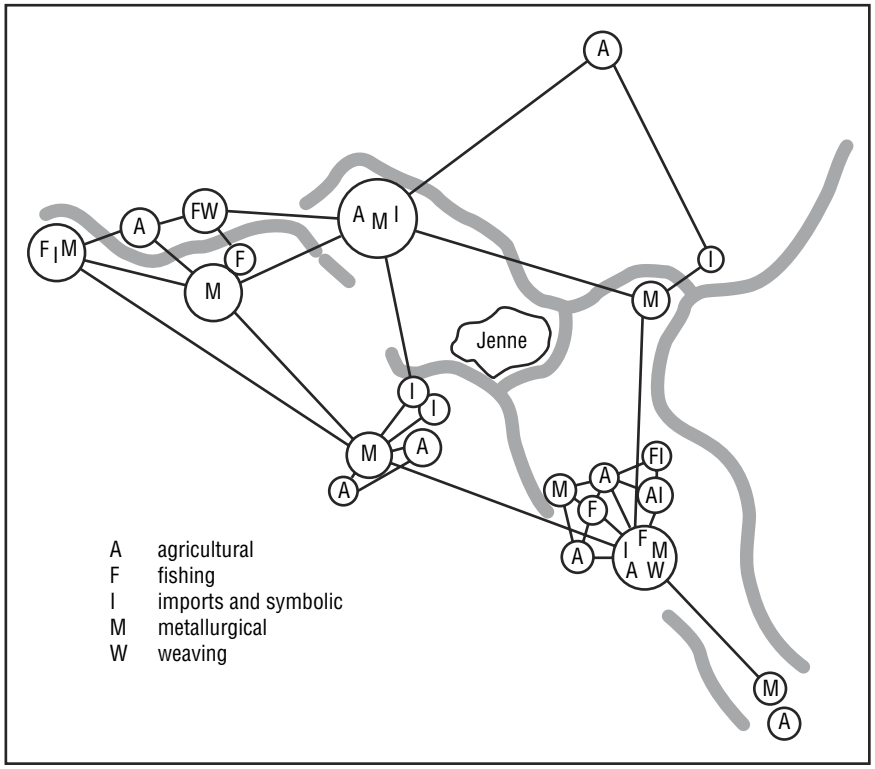
Figure 16 – Jenne-Jeno Urban Cluster



From McIntosh 1998

Fishing, herding, gathering (e.g., wild swamp grasses), and hunting were important subsistence activities. Smiths used and worked iron, fashioning the metal into jewelry, weapons, and tools. From the 4th century on the city emerged as an important producer of craft goods with the development of weaving, woodworking, pottery making, and the manufacture of copper objects. It continued to be a center of iron production. The production of bronze became important by the 9th century, replacing copper as the preferred metal for jewelry. In the 10th century brass was imported from North Africa and Tegdaoust/Awdaghast. It coexisted with bronze as a popular metal for ornaments of all kinds. Stratified layers dated between the 5th and the 9th centuries have yielded an abundance of products—painted pottery, copper and bronze artifacts of diverse sorts, gold jewelry, glass beads, numerous iron objects, especially lance heads and swords, and much more. Excavations reveal that a smithy was installed in part of the city around 800 to mold copper and bronze into ornaments and to forge iron. Smithing continued in this space for the next 600 years, suggesting to the archaeologists that artisans had become organized in castes and operated in specific, designated locales (McIntosh 1995; McIntosh 1998: 173–78).

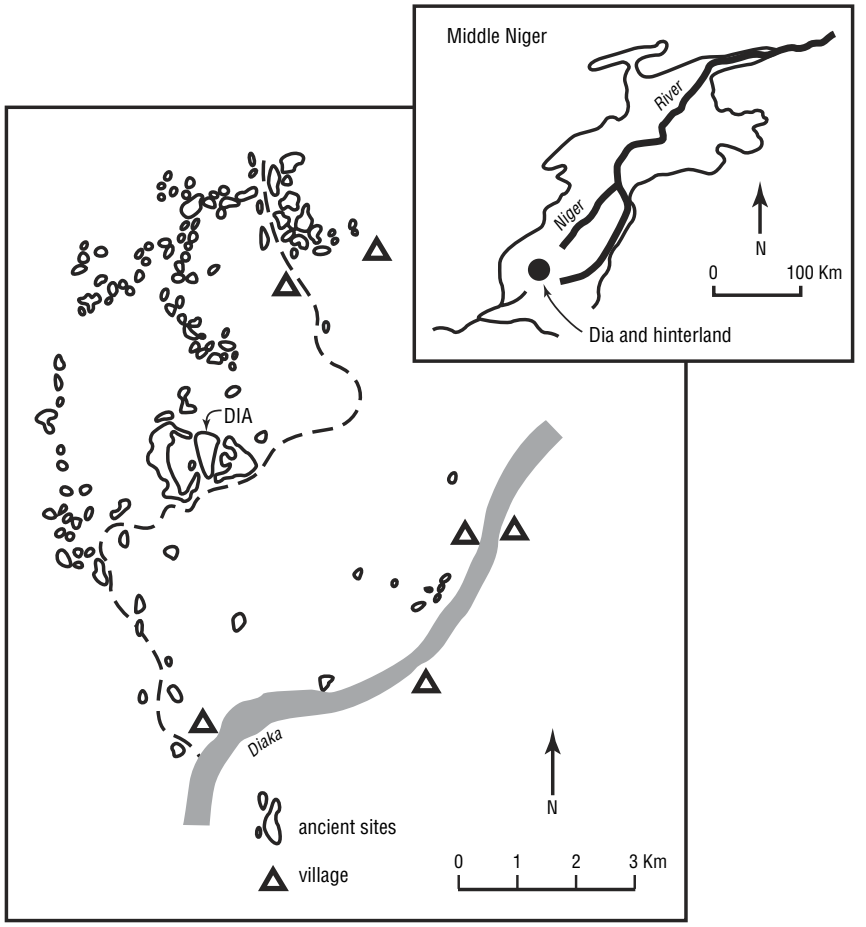
Figure 17 – Clustered specialist settlements within 4 km of Jenne-Jeno



From McIntosh 1998

It is important to note that iron, gold, and copper deposits were not to be found in the Inland Niger Delta. Iron ore and grinding stones were imported from sources at least 50 kilometers away. Copper was imported from Saharan sources 300–500 kilometers distant. The Sahara also supplied salt, sandstone, and semi-precious stones. These were exchanged for rice and other staples, fish oil, smoked and salted fish, and so on. Until the 10th century the main supplier of salt was the SV, after which Saharan salt assumed primary importance. In the 7th century Jenne-Jeno imported gold from sources at a distance of 600 kilometers, where it was exchanged for copper, fish and fish products, and rice. The town was trade-oriented from its beginning as a chemical analysis of six glass beads revealed. The beads were found in contexts dating from the last two centuries B.C. to 1400 A.D. The earliest ones are likely to have been made in India or East or Southeast Asia, while a later one might have come from India. Another may have come from the Roman world, either Italy or Egypt, and two others from Islamic sources (McIntosh 1998; also Magnavita 2002a; Magnavita 2002b;

Figure 18 – Dia-Shoma and its Clustered Sites



From McIntosh 1998

Magnavita and Pelzer 2000). The city was evidently a focal point of BGNs and PGNs, the latter extending more than 1500 kilometers to the north and east.

Wangara trading networks (BGNs and PGNs) joined the whole MNV into a single commercial network running from the goldfields in the Upper Niger basin to the Lakes Region and the large market of Tiraqqa. They linked the MNV to the Maghrib and al-Andalus via trans-Saharan exchange networks. The Jenne-Jeno urban cluster was part of this trading system (Devisse 1988; see Figures 8, 11, 12, and 13). Archaeologists have identified three trading spheres of the Jenne-Jeno complex: (1) the immediate hinterland, 0–50 kilometers; (2) the intermediate markets (50–200 kilometers); (3) the distant markets (200+kilo-

meters) (Figure 15) (McIntosh 1995; McIntosh 1998). Each trading sphere represented BGNs and PGNs of the Wangara trading system. Archeologists say nothing about how Wangara trade was organized, but one must assume that the "landlord trading system" (*système des logeurs*) was operational in the first millennium A.D. This important and ancient institution—also known as the "landlord system of long-distance trade"—was essential in the interaction networks. By means of this institution, stranger-traders could find lodging with a landlord or in a separate house owned or rented by a landlord. The landlord stored traders' goods, provided commercial intelligence by furnishing information about prices, the security or insecurity of trade routes, and demands from distant markets and rendered other services, such as supplying porters, pack animals, or boats and giving credit (Hill 1971). A landlord might also act as a commissioned broker. Wealthy and influential landlords would have had agents in towns dispersed throughout the networks of trade. Berber-speaking Imazighen and Arab merchants would have had social and personal ties to various Wangara landlords in the MNV, and this relationship would have been the basis for long term trading commitments.

In 850/900 a monumental wall of cylindrical bricks was built. Between 3–4 meters wide, it ran almost two kilometers around the city. The residential occupation of Jenne-Jeno became increasingly dense between 300 and 800, and the city probably reached its greatest spatial extent in the late 9th century, when the walled area covered 33 hectares. It was at its most prosperous from the 8th to the 12th century. Another settlement, about one kilometer away and known as Hambarketolo (9 hectares in area) was functionally part of the walled city. An earthen causeway connected the two settlements. Their combined area was 42 hectares, and both would have functioned as a single urban unit from the 8th century until the abandonment of Jenne-Jeno (Figure 14). In addition to Hambarketolo, there were 25 other dependent settlements within a kilometer of the city. Within a four-kilometer radius of the city there were more than 60 settlement sites, which were occupied between 800 and 1000. Jenne-Jeno/Hambarketolo was the summit of a 3-tier settlement hierarchy. Archaeologists have measured a positive correlation of site size with surface artifact diversity on sites within a 4-kilometer radius of the city. This relationship suggests that at its maximum development the city formed the center of a socio-political and economic domain larger than its own immediate urban environment. Politically, it was very likely organized as a city-state, albeit one that probably paid revenues to Ghana/Wagadu between the 8th century and its abandonment.

Information on the population size of Jenne-Jeno is incomplete. The population of late 9th century Jenne-Jeno has been estimated at between 7000 and 13,000. Together with its satellite settlements located within one kilometer

of the city, the entire population could have amounted to between 15,000 and 27,000. There were 65 settlements within four kilometers of the town. By the end of the 9th century, the integrated nature of the complex is indicated by the existence of a 3-tier settlement hierarchy (Figure 16):

> **Tier 1:** 2 very substantial sites over 20 hectares (two sites: 5,840+ (146 inhabitants per ha. to 15,560+ (389 inhabitants per ha);
>
> **Tier 2:** several medium-size sites, 8–19 hectares (one site: 1,168+ (146 inhabitants per ha.) to 7,391 (389 inhabitants per ha.);
>
> **Tier 3:** a great number of smaller sites, averaging 0.95 hectare in size (on average probably fewer than 200 inhabitants per site).

Although it was a satellite settlement, Kaniana, occupying 41 hectares, was bigger than Jenne-Jeno. One can estimate that Kaniana's population fell between 5,986 (146 inhabitants per ha.) and 15,949 (389 inhabitants per ha.). Surveys reveal that sites larger than 1.5 hectares (one site: 219+ to 583+ inhabitants) usually had several craft or occupational specializations, and sites smaller than 0.5 hectare (one site: 29 to 77 inhabitants) rarely demonstrated evidence of specialized activities. The settlement hierarchy would have comprised very small peasant hamlets, larger but still small craft settlements, and larger settlements, where several craft corporations and other social groups co-existed (Figure 17; McIntosh 1991: 204, 206, 208–09).

Within a 25-kilometer radius of Jenne-Jeno archaeologists have counted more than 65 tumuli. If most of the tells were occupied at the same time, the total occupied area of the town's hinterland would have exceeded 190 hectares. In the late 10th century this area contained a total of 404 villages and hamlets. A conservative figure gives the town and its 190-hectare hinterland a resident population of 42,000 in the 10th century. However, one archaeologist has proposed that a figure of 50,000 residents would not be an unreasonable minimum at the time of greatest prosperity at in the end of the 10th century. However, on the basis of a low of 146 inhabitants per hectare and a high of 389, one can calculate that the hinterland's resident population would have amounted to 27,740 and 73,910 respectively. The assumption is that all or the majority of the satellite communities were occupied at the same time. On the basis of radiocarbon dating, recent archaeological fieldwork has demonstrated that this was not the case. There was greater population movement within the Jenne-Jeno urban complex than previously believed. The precise relationship of the historical demography of the complex and occupational specialization within it necessitates further study (Clark and Hietala 2002).

The satellite communities were certainly loci of specialists of different kinds. Archaeologists identify the subsidiary settlements of the 10th and 11th

century Jenne-Jeno complex as functional specialist workshops of metalworkers (in iron, copper, gold, bronze, and brass), potters, sculptors, workers in wood, ivory, stone, leather, and bone, bead makers, jewelers, brick-makers, builders, and shipwrights. In addition, there were traders, herders, fishers, peasants, hunters, transporters and caravaneers, religious specialists, political functionaries, and professional soldiers. The population of the city and its hinterland would have constituted ranked occupational and cultural-religious status groups (Figure 17). There were different categories of servile status. Free artisans were either organized in guilds (e.g., masons) or in endogamous, hierarchically ranked hereditary castes (e.g., workers in metal, leather, and wood) (McIntosh 1998). Intensive surface collections at these sites have revealed that in the 9th and 10th centuries the basic classes of material culture (pottery, tools, weapons, jewelry, etc.) were identical to those at Jenne-Jeno.

The Jenne-Jeno district, which covered an area of 1100 km² and extended more than 25 kilometers from the city, was densely occupied throughout all of the first millennium A.D. There are no population estimates for this larger territory, but it is noteworthy that site density in the Jenne-Jeno district was nearly 10 times the density of occupied settlements in the same space today. This density was achieved between 750 and 1150 and coincided with the time when the city achieved its maximal areal extent and when Koumbi Saleh was approaching its maximum development. Elsewhere in the MNV the floodplain population and settlement density also realized their maximum development. Population density on this scale was maintained through wet and dry phases and the oikumene's A- and B- cycles of expansion and crisis.

S.K. McIntosh reports that the evidence of site expansion and site density at Jenne-Jeno between 400 and 900 A.D. (see Figure 14 above) was accompanied by changes in the domestic pottery styles, indicating the need to cook food and store water for larger numbers of people (McIntosh 1995: 374). From the 10th to the end of the 12th century other important changes occurred in the city's material culture, architecture, and trade patterns. At the beginning of the 10th century a cylindrical, adobe brick architecture is evident. A city wall was built, and terra cotta statuettes appeared in domestic contexts. In the early 11th century brass imported from North Africa and Tegdaoust/Awdaghast replaced bronze as a preferred metal for ornaments and North African beads became common, replacing to some extent beads manufactured in Kawkaw/Gao and Tadmakka, a major southern Saharan urban center. It is likely that the conduit for Jenne-Jeno's trade was Koumbi Saleh. Spindle whorls, indicating the presence of weaving, appear in substantial quantity, and rectilinear houses are built for the first time. Statuettes become more elaborate and stylistically varied. Among these, warrior and mounted warrior styles are to be found (McIntosh 1995: 214–15; Cissé 1998: 96–105; McIntosh 1998: 211–12, 278). The appearance of equestrian statuary occurred at the same time as the construction of monumental tomb clusters for Ghana/Wagadu military and political elites (see above). In the 11th and 12th centuries there is a flurry of building and rebuilding activity in some parts of the city, reflecting obvious changes of some sort—in family structure, in shifts in social status, or in social and class struggles.

Around the middle of the 12th century population decline set in, and it continued through the 13th. In the early 14th century Jenne-Jeno was completely abandoned. Most of the population had earlier moved three kilometers to the northwest and settled in (New) Jenne, a Muslim (Wangara) trading town and center of learning.

Summary

Archaeological fieldwork has shown that the WS and the WSa were important sites of urban core formation in the second and first millennium B.C. It has also revealed that the pre–13th century MNV floodplain was a densely populated, agriculturally rich landscape of massive habitation sites, monumental elite tombs, megaliths, and economic specialization including metalworking on an industrial scale. To the Latin Christian and Muslim Mediterranean world the MNV was rich in gold. Two MNV urban cluster sites that have enjoyed close archaeological study in recent years are Jenne-Jeno and Dia. For a good part of the first millennium A.D. Ghana/Wagadu was a dominant force. Archaeology has provided important evidence regarding the chronologies, material culture, morphology, and territorial extent of the Koumbi Saleh complex, the Mema district, the Lakes Region, and the southern Saharan caravan-city of Tegdaoust/Awdaghast. The interaction networks of the Ghana-Wagadu formation encompassed the entire Western Sudan world-system.

PART THREE THE WESTERN SUDAN WORLD-SYSTEM II

Kukiya and Kawkaw/Gao

East and south of Ghana/Wagadu was the powerful and wealthy Kawkaw/Gao tributary system, which stretched for several hundred kilometers along the floodplain. In the 1990s archaeological surveys were carried out south of the Lower Inland Delta, in the Ansongo and Bentia districts, in order to identify the different phases of urban settlement formation within this system. By focusing on site size in order to distinguish rural and urban settlements, the archaeologist, N. Arazi, was able to identify a settlement hierarchy for his two study areas.

> Sites ranging between 30 and 80 [hectares] may be comparable to known… 'cities' such as Jenne-Jeno (33 hectares). Sites of between 10 to 25 [hectares] form an intermediate category, and communities of less than 1 [hectare] to 10 [hectares] are either satellites of larger settlements or villages or hamlets (Arazi 1999: 39).

The biggest sites were more than twice the size of Jenne-Jeno and represent multi-functional centers. Arazi's intermediate sites and small sites formed the hinterlands of these centers, which would have provided specialized services for the smaller communities. The Ansongo survey revealed intermediate and small sites—essentially farming and iron-working communities—but no urban-size settlements. The Bentia survey, on the other hand, indicates the presence of a three-tier settlement hierarchy and clear evidence of urban development at the end of the first millennium B.C. and in the early first millennium A.D.

One of the largest sites, known as Bentia Village, is believed to be the location of Kukiya, a place of considerable historical interest. It was the first political capital of the Kawkaw/Gao state system and was a major trading center throughout its history. At the beginning of the first millennium A.D. it covered an area of 33 hectares, and could have had a resident population range of 4,818 to 12,837 (excluding its clustered settlements). Arazi situates it in the wider context of Niger Valley urbanism:

> [D]ue to the presence of urban sites in conjunction with intermediate and rural settlements Bentia exhibits a particular phenomenon of settlement pattern, which has been termed 'urban clustering.' This form of spatial patterning can be found in regions as diverse as the Mema and the upper Inland Niger Delta around Dia and Jenne. These spatial patterns are believed to be the beginnings of urbanism, which sees the development of smaller communities, all simultaneously occupied in close proximity, providing various services to its hinterland…. The settlement of Bentia Village (33 ha.) seems to have constituted the central site during [the] late 1st millennium B.C –1200 A.D. The large intermediary sites of Sahidan Thakouaro (25 ha.) and Tando Husubiya (18 ha.) were occupied during the same period as well as the rural sites of BIII–96 (2 ha.), BIV–96 (1 ha.), BVI–96 (9 ha.) (Arazi 1999: 39–41; also Mauny 1967: 120).

If the areas of the two intermediary sites and the three rural sites—all simultaneously occupied—are accepted as part of a Kukiya/Bentia urban cluster, the spatial extent of the complex would have amounted to 98 hectares, and the population could have ranged between 14,300 (146 inhabitants per ha.) and 38,122 (389 inhabitants per ha.) at the end of the first millennium B.C.

Arazi provides a chronology of the Bentia sites:

> **Phase 1**, 2nd–1st millennium B.C.: Late Stone Age and earliest Iron Age pottery resembles ceramics from southern Sahara and Sahil, implying extensive BGNs; there is no evidence of town settlements;
>
> **Phase 2**, late 1st millennium B.C.–early 1st millenium A.D.: the earliest urban clusters appeared; some ceramic styles similar to wares from Jenne-Jeno (250–B.C.–350 A.D.);
>
> **Phase 3**, early 1st millennium A.D.–1200: the most prolific period of urban cluster development; intensive iron working and new pottery styles; in the 8th century the separation of smithing activities from habitation sites, suggesting the emergence of a blacksmith caste; a 15–hectare cemetery with stelae bearing Arabic inscriptions in the Kufic script (12th–15th centuries) (Arazi 1999: 25, 27).

Phase 1 probably represents a rural agro-pastoralist population, on and above the floodplain, engaged in fishing, farming, herding, and some craft activities. Phases 2 and 3 are distinguishable from each other and from phase 1 on the basis of their social divisions of labor. The urban clustering in phase 2 can be attributed to the unity of long-distance commerce and crafts, i.e., artisanal-mercantile groups, collectively known as the Sorko, specialized in riverine transport, boat building, and aquatic hunting and fishing. As "Masters of the River", they engaged in commodity production as boat builders, aquatic hunters, and fishers. For the purposes of trade and boat building, they founded a number of river ports along the Niger between the Lakes Region and Kukiya (cf. Tymowski 1967: 79–80; Tymowski 1971: 13–18; Last 1985: 176–78). They were socially and politically dominant in the centralization of surplus, which took the form of commodities (e.g., boats, hippopotamus tusks, and dried/salted fish). In phase 3 the separation of commerce and craft was a social basis for the prolific development of urban clusters. The separation can be attributed to the arrival of professional traders—the Wangara and the Habasha—in Kukiya. They specialized in land transport and their activities were organized around caravans and caravanserai not riverine trade and transport. With this development the Sorko groups lost their position of political prominence. Kawkaw/Gao, which replaced Kukiya as the capital, probably in the 7th or 8th century, functioned as a seat for Wangara merchants, who dominated the western trading networks of the city, and Habasha merchants who dominated the city's eastern trading networks (PGNs) (Last 1985: 174–75, 177–79, 189–92, 204–06, 209; Hadj-Sadok 1968, passim). The late first millennium B.C. and the early first millennium A.D. can be described as an A-phase (100 B.C.–200 A.D.) in the history of the Kawkaw/Gao-Kukiya system. This phase corresponds chronologically with the A-phase dates of the Afro-Eurasian oikumene.

Without counting its satellite settlements, the spatial extent of Kukiya during phase 3 was about 66 hectares, suggesting a possible population range of 9,636 (146 inhabitants per ha.) to 25,674 (389 inhabitants per ha.). An early 20th century survey of the city's site revealed an immense space with several cemeteries and covered with potsherds and fragments of grindstones and other lithic material. The only intact monuments were numerous tombstones. The engravings on the tombstones were in Arabic (12th–15th centuries) and in the tifinagh and/or the Old Saharan script(s). The tifinagh/Old Saharan script(s) can probably be dated from around 300 B.C. to the 9th or 10th century. A late 20th century survey concludes that the city formed a central site in a network of smaller specialist communities engaged in farming and large-scale iron and gold production. It was a typical urban cluster and was, no doubt, in commercial contact with the Garamantes Kingdom/Federation in the Central Sahara (ca. 500 B.C.–7th century A.D.), a principal source of salt (Liverani 2000a; Liverani 2000b). There have been suggestions that the gold imports of Roman Carthage and Alexandria came from Kukiya. Ivory and semi-precious stones were probably other exports. A 2nd century A.D. bronze feminine Janus-figure from Cyrenaica was found in a large cemetery in the Bura region south of Kukiya. The find attests to the city's long-distance trade connection to the cities of Cyrenaica and Tripolitania, which were prosperous centers in the Roman and Byzantine periods (Warmington 1986: 167; *Vallées du Niger* 1993: 546–47; Christides 2000, part 2; also Liverani 2000a).

Other grave goods found in the Bura cemetery, dated by archaeologists between the 3rd and the 10th centuries, are further evidence of the wealth and prosperity of Kukiya. Among the grave goods are 400 terracotta sculptures of animals and people. There are indications of pronounced social stratification, for some graves contained a great amount of copper and bronze jewelry as well as huge vases mounted with large human figures. The graves also contained terra cotta equestrian figures, some 1½ meters high. They, too, are signifiers of social ranking and exhibit the importance of cavalry—richly dressed horsemen with copper and bronze bracelets, necklaces, and other jewelry and weapons (swords, bows and quivers, and lances) and armor. They were symbols of a political culture, epitomized in a ruling dynasty, but they were also symbols of state centralization. In the 12th century Kukiya was a dual city. Situated one kilometer to its southwest was a Muslim trading center, presumably founded by Wangara merchants. The orientation of the settlement's trade links was towards the north, south, and east (Figure 8) (Desplagnes 1907: 75–76; *Vallées du Niger* 1993: 548, 550, 552, 553; Insoll 1996; Cornevin 1998: 206–07).

Archaeological investigations show that Gao Ancien, one of Kawkaw/Gao's qusrters, was an established and commercially thriving center by 600 A.D.

(see Figure 19). It was initially oriented to the river trade (of the Sorko), but later it turned toward the land-based caravan trade of the Wangara and other merchants. At the same time, it embarked on territorial conquests, thus establishing itself as a power center. These developments can probably be attributed to the military conquests and expansionism of the Ghana/Wagadu state organization (however cf. Lange 1991; Lange 1994; Hunwick 1994). They can also be attributed to expanding trans-Saharan traffic.

Recent archaeological fieldwork offers a chronology pertaining to five different sections of the Kawkaw/Gao urban complex (see Figure 19):

Gao Ancien, royal and merchant's quarters facing Gao-Saney, the Tilemsi valley, and the trade routes leading into and across the Sahara.

Phase 1, 6th–early 9th century; first occupational level—primary phase of banco (adobe) brick building; craft production.

Phase 2, mid 9th–late 10th century; two phases of banco brick building; large-scale craft production.

Phase 3, 11th and early 12th century; considerable building activity in banco, fired brick, and stone, which included a central walled citadel of brick buildings and funerary structures; a great deal of structural debris; craft production (metalworking, bead and pottery making, weaving, leather working, and stone cutting) continues to expand; a boom period for inter-regional trade and the trans-Saharan trade; the central nucleus of the trader's quarter was enclosed by a stone wall with a gatehouse.

Phase 4, early-mid-12th–late 13th century; considerable building activity (e.g., the Friday mosque).

Gadei, artisans' and fishers' quarter facing the Niger; engaged in the riverain trade and the supply of hippopotamus ivory to distant markets.

Phase 1, early 7th century or before; much structural debris.

Phase 2, mid-7th–early 11th century; abundant structural debris; evidence of crafts (pottery making; metalworking; weaving; bead making).

Phase 3, early-mid 11th–late 14th century; numerous banco structures, some of considerable size; continued importance of crafts; gold recovered from the site; population included Muslims and non-Muslims.

Gorongobo, located at the mouth of the Tilemsi valley, 1 kilometer northwest of Gao Ancien; close to a dry water channel, which was probably navigable from 700–1100, and linked Gao Saney to the Niger. The site contains a big cemetery, with numerous stelae carrying Arabic inscrip-

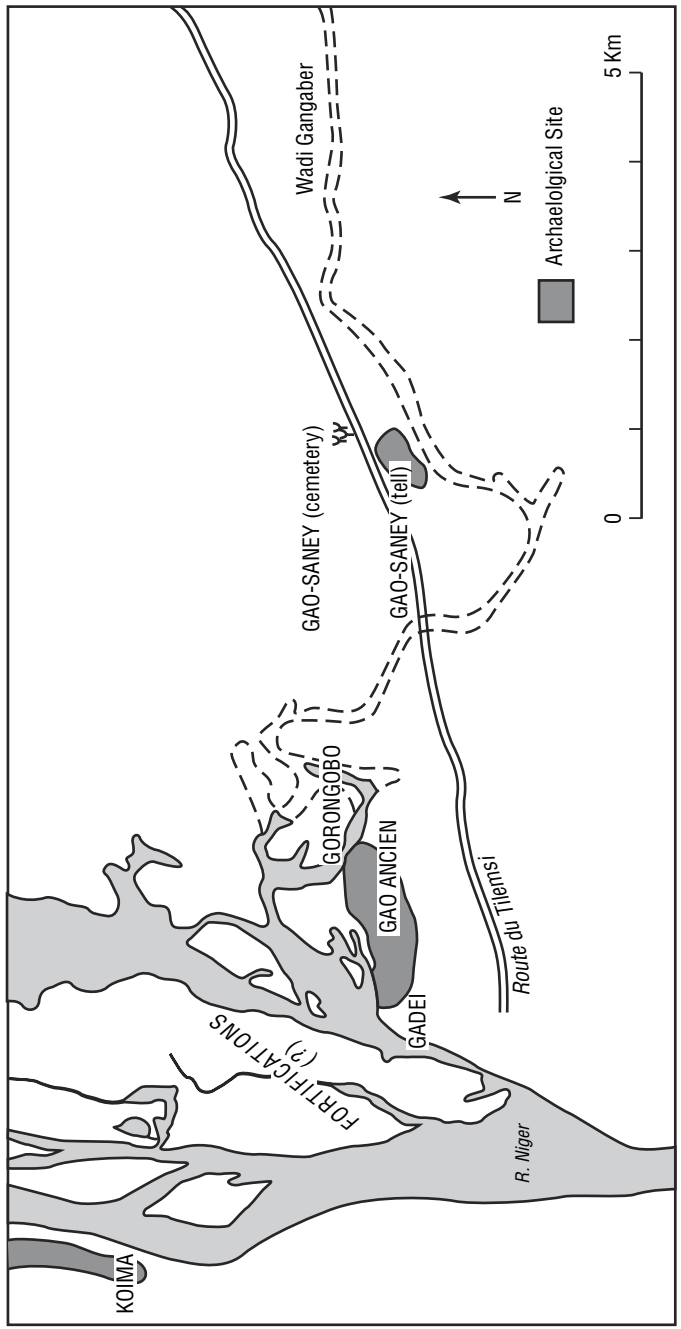


Figure 19 – The Archaelolgical Landscape of the Kaw Kaw/Gao Urban Complex

tions (12th–13th centuries), a firebrick oval grave, and a large surface spread of potsherds, copper ingot fragments and bead fragments, suggesting that the site had important craft industries.

Gao-Saney, 6 kilometers east of Gao Ancien; from the 9th century it was a Muslim quarter, a focal point for caravans, and a major crafts center (e.g., weaving, metalworking, bead and pottery making); constructions included a massive, multi-storied, domed tomb and brick buildings with glass windows (10th–13th centuries); a royal cemetery with Arabic tomb inscriptions (11th–13th centuries); to the northeast are three large and three small (unexcavated) tells, suggesting that this section of the city formed part of a larger settlement cluster.

Koima formed a right bank settlement complex and a harbor (?) opposite Gao Ancien; surface surveys found different types of pottery sherds, earlier than those found at Gao Ancien and Gao-Saney; some sherds are similar to pottery styles collected on MNV floodplain sites and are dated to between 200–600 A.D., on the one hand, and 400–800, on the other (Flight 1975; Insoll 1996; Insoll 2000).

Throughout its history the city remained unwalled, but archaeological surveys reveal that it was surrounded by a variety of settlements, dating from different periods (7th–16th centuries), and utilizing different styles of construction. Perhaps, the majority of them were erected between the 8th and the late 13th centuries. The contiguous sites include seven fortifications, the largest of which is a massive fortress 410 meters long and 230 meters wide, as well as undefended sites, among which are metalworking and pottery workshops and settlements (Insoll 1996: 7–14). The city differed from Koumbi Saleh and Tegdaoust/Awdaghast in that it was rooted in a productive environment, providing both foodstuffs (e.g., rice, millet, dates, watermelon, and fish) and other resources. The city was to remain a dominant center until the second half of the 13th century, at which time it came under the rule of the Mali Empire and its settlement pattern was disrupted and altered.

From the 6th to the mid-13th century the city complex grew continuously, without any ruptures or disabling crises. In contrast to the floodplain of the MNV, the floodplain along the Kawkaw/Gao-Kukiya stretch of the Niger did not encounter massive population displacement. Furthermore, it experienced no B-phase breaks. How is this core's extended A-phase to be explained? Its initial development rested on its central re-distribution function within an inter-regional trading system, which extended from the Lakes Region and the Niger Bend into the forest-based core zone of the Lower Niger basin (in modern Nigeria; see Figures 2 and 8 above). Sorko traders dominated the riverine traffic

between Kawkaw/Gao, Kukiya, and the Lower Niger Valley (cf. Kuba 2000; also Vanacker 1979: 174–75). Of considerable historical significance for the social development of this Kawkaw/Gao core zone is the fact that core growth and expansion in the Lower Niger Valley proceeded on a colossal scale and along an uninterrupted trajectory between the 5th and the 15th centuries.

In the second half of the first millennium A.D. developing Lower Niger basin centers were commercially linked to the Western Sudan world-system via an expanding Kawkaw/Gao core. Archaeological fieldwork has been particularly fruitful in shedding light on the historical transformations and connections. It reveals sites with exceptionally rich grave goods and towering constructions that date from this period. One major site, which dates from about 900 A.D., is Igbo Ukwu. A regal burial site, it was a storehouse of regalia with iron and ivory objects, numerous highly ornamented brass, bronze, and copper castings and tens of thousands of glass and stone beads (from the Mediterranean world and historic India) as well as many other items. Many of the imports are believed to have come via Kawkaw/Gao and Kukiya. A second principal site is the city of Ile-Ife. Surrounded by a ring of walls over 12 meters high, with the outer ring over 40 kilometers in circuit, it flourished between 950 and 1300/1400. Graves rich in artifacts, numerous shrine structures, elaborate potsherd pavements scattered throughout the city, bronze and terracotta sculpture, and a distribution of artifact finds within the walls as well as a vast area beyond them, point to its affluence. According to the Nigerian archaeologist A. Ogundiran, Ile-Ife was the political and cultural hub of the Yoruba-Edo (Benin) interaction system by the 12th–13th centuries. Its prosperity and rich material culture were contemporary with the growth and increasing wealth of Kawkaw/Gao. These developments relate to the importance of the PGNs that joined the cities.

A city that was part of the Ile-Ife dominated interaction system was Orile Owo. Founded in the 8th or 9th century, it developed into a major urban center with inner fortifications (wall and moat) extending 15 kilometers in length and outer ones measuring up to 70 kilometers in circumference. Still another site within the interaction system is Benin Iya—acclaimed the "world's longest ancient earthworks." Its construction dates from the 5th or early 8th century. It consists of a linear earthwork cluster up to 24,000 kilometers in length and extending over an area of 6,500 square kilometers. Its walls reached 20 meters in height. In its central zone, the complicated network achieves densities of up to seven kilometers of earthworks per square kilometer. A fourth site is known as Sungbo's Eredo. Cited as "Africa's largest single monument," it is a 20-meter high wall with a moat five to seven meters in width that surrounds the city of Ijebu. Probably built in the 9th century, the wall measures 160 kilometers in circumference. Through its central re-distribution function in an inter-regional

trade network, the Kawkaw/Gao tributary system drew on the resources of these major centers of surplus appropriation and centralization. This relationship endured for more than four centuries (Ozanne 1969; Last 1985: 177–79, 204–09; *Vallées du Niger* 1993; Insoll and Shaw 1997; Darling 1998; Darling 2000; Kuba 2000; Connah 2001: 160–66; Ogundiran 2000: 35–41; Ogundiran 2001, pp, 27–37; Ogundiran 2002: 6–8, 9; "African Legacy" n.d.).

According to the 9th century geographer and astronomer al-Khuwarizmi (d. 846/847) Kawkaw/Gao was a powerful kingdom and was politically independent of Ghana/Wagadu. The traveler-administrator Al-Yaqubi (d. 897) provides a useful description of Kawkaw/Gao at a time when it had achieved political dominance in the Western Sudan:

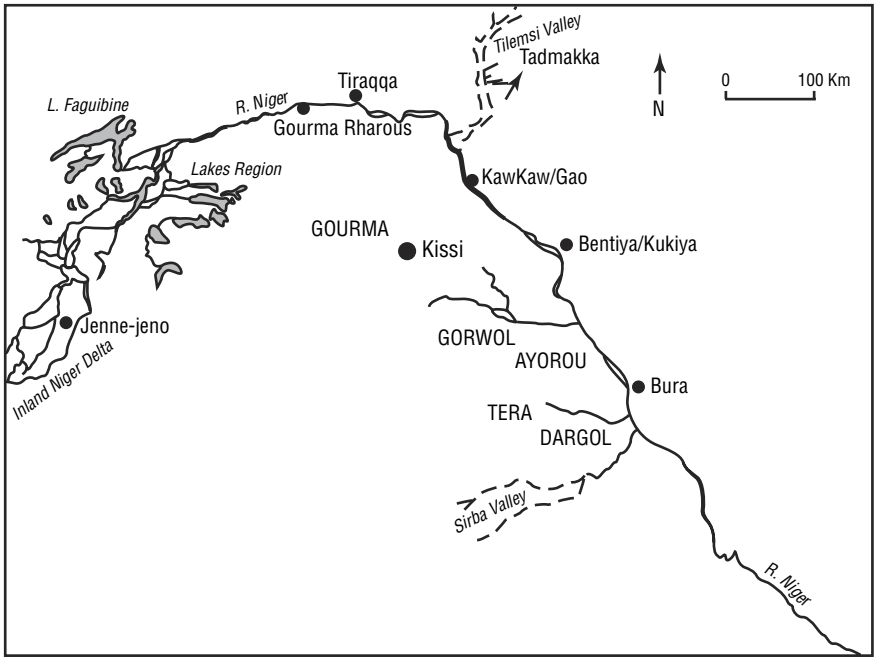
> [Kawkaw/Gao is] the greatest of the realms of the Sudan, the most important and powerful. All the kingdoms obey its king.... [T]here are a number of kingdoms of which the rulers pay allegiance to him and acknowledge his sovereignty, although they are kings in their own lands (Levtzion and Hopkins 2000: 21).

The historian al-Masudi (d. 956) describes the polity in similar terms (Levtzion and Hopkins 2000: 35). At the time, it controlled the MNV up to the Lakes Region and possibly a little beyond (see Figures 2, 8 above and Figure 20). It was also a time when the import and export of "a variety of finished goods and commodities in all directions of the compass" continued to grow. The full development of the city was realized with the construction of large buildings in the royal and merchants' quarters. The largest structures included a walled citadel, a Congregational or Friday Mosque, which was second in size only to the Great Mosque of Koumbi Saleh, royal tombs, and a palace or a rich merchant's residence. Other constructions such as public baths and schools are, in the opinion of the investigating archaeologist, buried beneath the sands that cover the city's ruins (Farias 1974; Insoll 1996; Insoll 2000).

Writing in the late 10th century, the geographer al-Muhallabi (d. 990) relates that the king of Kuku (= Kukyia (?) or Kawkaw/Gao)

> [H]as a town on the Nile [Niger], on the eastern bank, which is called Sarnah [Gao-Saney], where there are markets and trading houses and to which there is continuous traffic from all parts. He has another town to the west of the Nile where he and his men and those who have his confidence live. There is a mosque there where he prays but the communal prayer-ground is between the two towns. In his own town he has a palace which nobody inhabits with him or has resort to except a eunuch slave. They are all Muslims. The costume of their king and his chief companions consists of shirts and turbans. They ride horses bareback. His kingdom is populous.... The wealth of the people of his country consists of livestock. The king's treasure-houses are spacious, his treasure consisting principally of salt (Levtzion and Hopkins 2000: 174).

Figure 20 – Towns and districts of the KawKaw/Gao System



From Insoll 1996

This account is contemporary with a period of big construction projects and the enrichment of material culture in the Gao Ancien, Gadei, and Gao-Saney quarters. Furthermore, it clearly notes the close link between the centralization of authority (the king and his chief companions, eunuchs, and treasure houses), Islam (a mosque and communal prayer-ground), and the mercantile handling of part of the social surplus (markets, trading houses, and continuous commercial traffic). It is tempting to equate the "continuous traffic from all parts" with the city's full incorporation into Wangara, Habasha, and Kharijite trading systems and, via the Sorko riverine-based trade network, with the intensification of commercial traffic with the Lower Niger basin centers (cf. Last 1985: 179–80, 204–06).

The Kawkaw/Gao urban complex imported iron products from the Lakes Region, where iron production was carried out on a massive scale between about 400 A.D. and 1000 (see above). Opposite Tiraqqa, on the south bank of the Niger, was Gourma-Rharous, a large iron-producing center with specialized, metalworking satellite sites. Its clustered settlements were quite big, one pair, for example, measuring repectively 19 and 47 hectares in area. In terms of trade and material culture Gourma-Rharous was closely linked to Kawkaw/

Gao. Together with its satellite settlements, it functioned, until the 13th century, as one of the biggest iron- smelting centers in the entire MNV. Gourma-Rharous-Kawkaw/Gao-Kukiya formed a single economic axis connected to BGNs and PGNs (see Figures 2, 8, and 20) (Insoll 1996; Insoll 2000; McIntosh 1998: 197–98).

Kawkaw/Gao maintained a close relationship with the gold fields and iron-working centers of the Sirba Valley and the great trading and craft center of Tadmakka in the Tilemsi Valley. Situated a few hundred kilometers to the south, the Sirba Valley was Kawkaw/Gao's principal source of gold. Founded in the 4th century A.D., Tadmakka was, by the 9th and 10th centuries, one of the leading centers of trade and crafts in the entire Western Sudan world-system. A sizeable number of Kharijite traders resided there from the 9th to the 12th century. An archaeological survey of the site reveals that the city center was one to two kilometers long and nearly one kilometer wide. The ruins of the entire urban complex covered an area of several square kilometers. It has yet to be excavated. To the east, the southern Saharan copper-producing centers of Maranda/Marandet and Takadda/Azelik traded with Kawkaw/Gao and were probably within its political sphere of influence (Mauny 1967; Lhote 1972; Lewicki 1981; Devisse 1988; Insoll 1996: 84–86). Copper imported from across the Sahara was "purified" and reworked in these centers and from these towns refined copper bars and objects were exported to the Kawkaw/Gao complex.

The Gao Ancien and Gao-Saney quarters manfuctured copper and copper alloy objects, including ingots, jewelry, and wire currency. Maranda/Marandet, where archaeologsts have found over 200,000 crucibles, was probably the world-system's principal copper/copper alloy producing center between 500/550 and 800/900 A.D. The Gorwol and Ayorou districts, a hundred or so kilometers downstream from Kukiya (see Figure 20), contain extensive remains of furnaces as well as habitation sites, testifying to the dimensions of iron and probably copper smelting operations and the scale of rural population density. Iron bloom and ingots were exported to the Kawkaw/Gao urban complex, where blacksmithing was a principal activity (Mauny 1967; Lhote 1972; Insoll 1996; Insoll 2000).

The 12th century geographer al-Zuhri provides an informative description of Kawkaw/Gao's trade.

> [Kawkaw is] the capital of Habasha. Caravans from the land of Egypt and from Waraqlan reach it, and a few from the Maghrib by way of Sijilmasa.... Silk and other objects of gauze and linen are imported into their country and from al-Andalus are imported saffron and cloth from Murcia and turbans and Susa cloth from Iriqiya. These Habasha are the richest and the best-dressed of people. The reason for this is that they stand between the Maghrib

> and Egypt and penetrate to the farthest point of the land of the Habasha (Levtzion and Hopkins 2000: 97; also Hadj-Sadok 1968; Insoll 1996).

An archaeological assessment of the city's ruins concludes that Kawkaw/Gao was the most important trading center in the Western Sudan world-system in the 11th and 12th centuries. Al-Idrisi's mid-12th century description of Kawkaw/Gao draws attention to the certain aspects of the city's political economy.

> The town of Kawkaw is large and widely famed in the land of the Sudan…. The king of the town of Kawkaw is an independent ruler, who has the *khubta* delivered in his own name. He has many servants and a large retinue, excellent apparel and beautiful ornaments. [His warriors] ride horses and camels; they are brave and superior in might to all the nations who are their neighbors around their land. The clothing of the common people of Kawkaw consists of skins with which they cover their nudity. Their merchants wear chemises and mantles, and woolen bands rolled around their heads. Their ornaments are of gold. The nobles and eminent persons among them wear waist-wrappers. They mix with the merchants, sit in their company, and take shares in their wares [participating in the profits] by way of *muqarada* (Levtzion and Hopkins 2000: 113).

A great social distance separated the ruling and commoner classes. The practices and purchasing power of a dominant class of nobles and horse warriors, constituting the aristocratic sector, on the one hand, and a class of professional traders, constituting the mercantile sector, on the other, ensured the regional centrality of the tributary organization. The labor of the urban commoner classes was responsible for the ornaments and clothing of the upper classes and the dense concentration of buildings that ordered the city's landscape. In the late 11th and early 12th centuries Kawkaw/Gao developed a distinct Sunni Maliki quarter, a process that was undoubtedly tied to the Almoravid movement (see below). It became home to a mixed population of Muslims, predominantly Sunnis but also Kharijites and Shiites, as well as non-Muslims (Insoll 1996; Insoll 2000).

Archaeological evidence reveals that in the 10th and 11th centuries the material culture of the different quarters of the city was abundant, richly varied, and opulent and that it was, economically, an integral part of the Muslim world. Gao Ancien, the city's nucleus, comprised public buildings of brick and banco construction (a Great Mosque), monumental architecture (a royal palace and elite residences), substantially built stone and brick walls ringed by graveyards, beyond which were other constructions of stone and brick. The quarter measured roughly 300 meters from north to south, and 200 meters from east to west, and covered an area of about two square kilometers. Archaeological remains extend over an area of more than two square kilometers beyond Gao Ancien.

In the different quarters of the city evidence of the urban material culture is impressive. The finds include a wide variety of local and imported products: glassware, luxury and utilitarian pottery, metalware of all kinds (in gold, iron, lead, copper, bronze, and brass), spindle whorls, beads (of ceramic, semi-precious stones, copper, gold, glass, wood, etc.). Glazed pottery from Ifriqiya, al-Andalus, and Egypt was abundantly represented and a wide variety of material was recovered during exactions. The material included numerous glass fragments, which represented different types of imported glassware. Window glass fragments were abundant in the Gao Ancien quarter, leading the archaeologist Insoll to conclude the window glass implies the presence of "substantial buildings" in the quarter between the 10th and 12th centuries (Insoll 2000).

Commercial and political relations between al-Andalus and Kawkaw/Gao were especially close between the 10th and 13th centuries (Insoll 1996; Insoll 2000; Haidara n.d.). In the same period, Ghana/Wagadu also maintained close trading ties to al-Andalus (see above). These connections can be attributed to a historical phenomenon described by Ian Blanchard. He relates that during the years 930–1125/30 an "industrial diaspora" occurred as the major focus of gold and silver production in the oikumene was relocated from Central Asia to Western and Eastern Africa and Western Eurasia respectively and a new intercontinental monetary-commercial system began to emerge (Blanchard 2001; also Spufford 1993repr., chapters 4–7; cf. Barendse 2003: 517–18). The Western Sudan world-system, in particular, was a leading producer of gold and Ghana/Wagadu and Kawkaw/Gao were principal distributors of the precious metal within the inter-continental system, although, as one archaeologist has concluded, the two formations were linked to different trading orbits.

Summary

Situated south and east of the MNV, a second dominant core zone was centered initially on the city of Kukiya and later on the city of Kawkaw/Gao. The emergence of this zone can be traced to the second half of the first millennium B.C., the time archaeology establishes for the earliest appearance of urban clustering. Kukiya was the principal urban cluster from that date until about the 7th or 8th century. At that time Kawkaw/Gao became the royal capital, replacing Kukiya. Archaeological fieldwork in the 1990s has provided an abundance of information about the capital and its environs, with respect to chronology, architecture, material culture, economic activities, and local and long-distance trade. On the basis of the city's ruins and artifacts one archaeologist opines that Kawkaw/Gao was the most important commercial center in the Western Sudan world-system in the 11th and 12th centuries.

PART FOUR: THE WESTERN SUDAN WORLD-SYSTEM III

The Senegal Valley

An early 1990s archaeological survey of the MSV floodplain covered an area of 32,000 km². It recorded over 10,000 tumuli or tells at 1,500 sites. However, earlier surveys (from the 1960s and 1970s) list a total of 23,000 tumuli. Whether 10,000 or 23,000, archaeologists agree that most of the tumuli date from the first and early second millennia A.D. The MSV probably emerged as a core zone within the Western Sudan world-system in the early first millennium B.C. At the time, it maintained close connections through migration and trade with the settlement complexes of the Tichitt and Tagant Traditions. In the later centuries of the first millennium A.D. it was a periphery of the Ghana/Wagadu tributary organization (see Figures 2, 3, 6, and 7 above).

With semi-desert lands to the immediate north and south, the floodplain of the MSV is a fertile and well-watered "oasis." It extends 430 kilometers along the river and is from 10 to 25 kilometers wide. A dominant feature of this section of the floodplain landscape is, in the words of one archaeologist, "extremely dense accumulations of cultural material in mounded settlements sites up to 7 meters high" (McIntosh n.d.). It has a particularly high density of sites and it also contains some of the largest tells compared to the tumuli sites in the Lower and Upper Senegal Valleys. It encompassed some of the most productive land in the floodplain and was a strategic central region where, historically, ruling dynasties seeking to control the entire river valley have often placed their capitals. In defining SV urban settlements, the archaeologists Becker and Bocoum say one salient feature is that "sites with more than 50 [megalithic] monuments can be classed as urban settlements or ancient capital towns" (Becker and Bocoum 1998: 164). Other features include the scale of spatial development, the presence of earth tombs (most dating to the 8th–14th century period), multifunctionality and specialization, the richness and diversity of the material culture, and the size of refuse dumps and cemeteries (Becker and Bocoum 1998; Cornevin 1998: 253–56).

Regional archaeological surveys of MSV tumuli and excavations on selected sites reveal the existence of five occupational phases. Walaldé, the largest of the phase one sites, seems to have developed around 800 B.C. and was thus contemporary with the founding of Dia in the MNV. It flourished for the next several hundred years as a center of iron and copper production. Archaeologists conclude that the site had a complex social organization and its inhabitants engaged in specialized, occupational activities. Walaldé copper came from the mines of Akjoujt, Lemdena, etc. (in present-day Mauritania). Copper metalworking techniques were in place in the SV in the early to mid-first millennium B.C. and

it seems likely that settlements in the WS and the WSa practiced a copper metallurgy at the same time and and probably earlier—in the 2nd millennium B.C. (Diop 2001; Deme 2002; Fenn 2002; Guèye 2002; "Senegal.Thiéhel-Guede" 2002; Killick, Fenn, and Deme 2002; also Lambery 1970; Lambert 1980). A second MSV urban site was a large walled settlement that was founded in the 5th century B.C. It had an important copper-working industry. The large MSV sites mark the first phase of SV urbanism.

A second phase of urbanization in the MSV began in the 3rd and 4th centuries A.D. and a third covers a period from the 9th to the 14th century (Robert-Chaleix 1991; Vernet 1993: 366, 376; Becker and Bocoum 1998; Cornevin 1998: 253–56). The occupational history of one major MSV settlement, the 67-hectare Sincu (Sintiou) Bara site, is instructive. Based on recent excavations, the site's chronology offers some insight into the process of development in the MSV sector of the SV core zone.

> **Phase 1**, 0–250 A.D., mixed farming (agriculture and herding), hunting, fishing, and gathering; widespread iron-smelting; break in settlement occupation between ca. 250 and ca. 400.
>
> **Phase 2**, 400–600, subsistence economy remained the same; a larger cylindrical iron smelting furnace was introduced and iron production increased substantially; new ceramic forms appeared and ceramic production grew considerably
>
> **Phase 3**, 600–800/900, the subsistence economy remained the same; iron production continued to grow; new ceramic styles continued to appear and pottery production continued to increase.
>
> **Phase 4**, 800/900–1200, a complete transformation of the economy with respect to agricultural and craft production and trade; new pottery styles intriduced; iron production expanded and a new metalworking technology (e.g., brass became especially common) appeared; a richer material culture compared to earlier phases (Thilsman and Ravise 1980; Garenne-Marot 1996; McIntosh and Bocoum 2000).

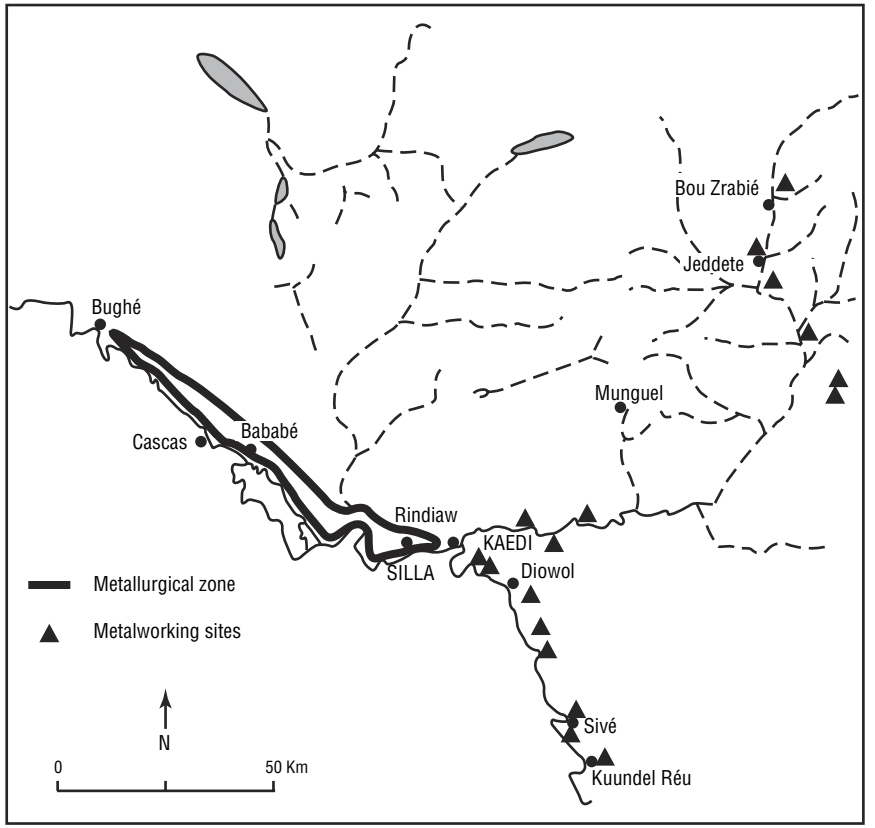
Phases 2 and 3 indicate a period of relatively slow growth with respect to agricultural production, but incremental changes occurred in craft production, which apparently met not only local needs, but also served more distant markets. Phase 4 was a time of transformational changes, not only in the craft and commercial sectors (BGNs and PGNs), but also in agriculture. In this period the MSV became an expanding core zone, achieving the height of its economic and political development between the 10th and the late 13th century. In terms of oikumene chronology, Sincu Bara's phase 1 corresponds to A-and B-phases

of the oikumene and the break in occupation (250–400 A.D.) coincides with a B-phase. Phase 4 begins when the oikumene is in a B-phase cycle and continues through an A-phase cycle. In this phase, its population, residing in a 67-hectare urban settlement, can be estimated at between 9,782 (146 inhabitants per ha.) to 26,073 (389 inhabitants per ha.). The population range of its unexcavated satellite settlements is not known.

Most of the tumuli of the Lower Senegal Valley date from the 700 to 1000 A.D. period. The remaining tumuli are several centuries earlier. Most of the MSV tumuli date from the 10th to the 13th/14th century. The total number of Lower and Upper Valley tells exceeds 15,000. Funerary monuments, or megalithic tombs, which are distinct from the Lower Valley tumuli, consisted of great stone circles and are almost as numerous in the Lower Valley as tumuli in the MSV. The earliest date ascribed to the tombs is 200 B.C. It marks, perhaps, the first appearance of towns in the Lower Valley. The stones weigh between two and ten tons and are from two to four meters high. Their positioning, or orientation, is said to conform to celestial sightings and this respect they were probably signifiers of a sacred geography. The tombs have yielded rich collections of grave goods—gold and silver jewelry, iron, bronze, and copper objects, luxury pottery, and so on (Becker and Bocoum 1998; Bocoum 2000; McIntosh and Bocoum 2000; also Deschamps 1980).

The earliest documented reference to the Senegambia region comes from a late 8th century work by al-Fazari. It refers to a densely populated Lower Valley polity called Waram, whose dimensions are given as 400 kilometers by 160 kilometers (see Figure 3; Pingree 1970: 117). Archaeologists assume its ruling classes erected the numerous monument tombs over a period of several centuries, perhaps as early as the 3rd century B.C. The wealth of Waram's elites came from their political control of the Awlil salt pans, which were located in Aftout es-Saheli, a coastal depression that extends 180 to 200 kilometers north of the Senegal Delta. Awlil was a periphery of the Lower Valley center and had systemic links with its processes of accumulation. The depression is 5 to 10 kilometers wide and was a major source of sea and rock salt for communities throughout much of the world-system. It was 600 kilometers, as the crow flies, from Tegdaoust/Awdaghast which was a principal salt market and a re-distribution center (see Figures 3, 11, 12, and 13). Caravans organized by the Gudala Imazighen transported salt and fish from Awlil to the WS, the WSa, and the MNV. Archaeological surveys of Aftout es-Saheli indicate that habitation sites in the depression were numerous, but the largest and greatest number of sites was near the Senegal Delta. The inhabitants of Awlil not only produced and traded in salt and dried/salted fish, they also traded in agricultural produce and gold. Some of the bigger settlements engaged in the production of

Figure 21 – Metalworking Centers in the Middle Senegal Valley (Takrur) (10th – 14th c.)

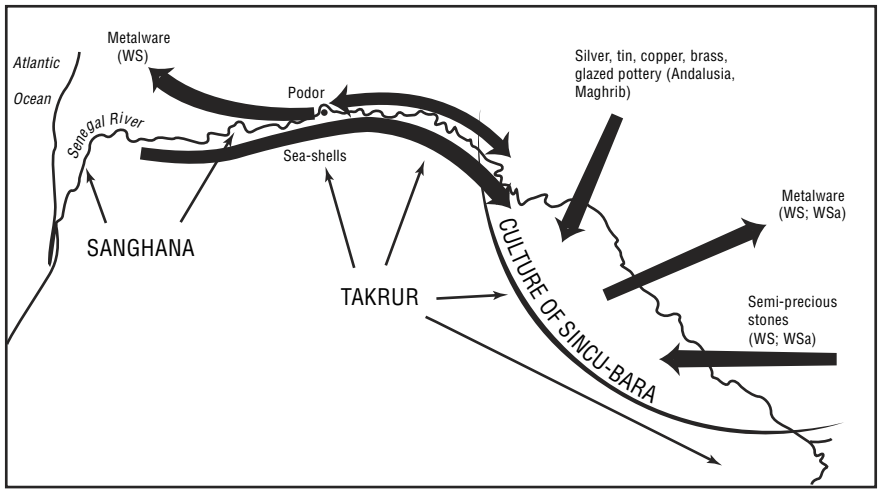


From Thilmans and Ravise 1980

copper and iron artifacts and pottery and not in salt production. All of the Awlil sites shared a common material culture—pottery, beads, spindle whorls, lithic objects, gold weights, and copper and iron artifacts—and their ceramic craftsmanship reveals strong associations with the pottery traditions of centers like Tegdaoust/Awdaghast and Koumbi Saleh and sites in the MSV (Robert-Chaleix 1991). With their rich grave goods, the funerary monuments and tumuli of the Lower Valley typify the scale of surplus accumulation in the SV during the period of Waram's political dominance.

By the 11th century there are no further references to Waram. In his account of the SV, al-Bakri refers to three Muslim political formations: Sanghana in the Lower Valley and Silla and Takrur in the Middle Valley (see Figures 21 and 22). The royal capital of Sanghana consisted of two towns on either bank of the

Figure 22 – Schematic representation of Sincu-Bara's PGNs (11th–13th c.)



Adapted from Thilmans and Ravise

river, and its habitations stretched to the Atlantic Ocean. The capital of Takrur was built in the MSV floodplain, and further upstream was the capital of Silla, which consisted of two towns on opposite banks of the river. From the 11th to about the late 13th century Takrur dominated the entire SV as well as territories extending north and south of the floodplain. The ruling dynasty converted to Sunni Maliki Islam in the early 11th century and politically aligned itself with the Almoravid movement, which emerged in the WS and WSa around 1052. It provided soldiers for the Almoravid campaigns in the Maghrib and al-Andalus (Hrbek and Devisse 1988: 354–57). Thus, the SV core zone became involved in the geopolitical re-constitution of the modes of accumulation and distribution within the PGNs that linked the Western Sudan world-system to North Africa and Andalusia. It signaled a change in the world-system's position in the oikumene accumulation and power hierarchy (see below; Levtzion and Hopkins 2000: 77–78, 107; McIntosh and Bocoum 2000: 4; Thilmans and Ravise 1980: 146–47 and note 118; also Hrbek and Devisse 1988).

What is the relationship between these processes and events and the finds of archaeology? Archaeological fieldwork provides evidence of a particularly intense phase of urbanization, and the political rise and Islamization of Takrur were central to this process. Thus, urban settlements in the MSV underwent, in the words of S.K. McIntosh, "a major and extremely rapid transformation in scale and complexity between A.D. 900 and the period of the Takrur Empire, which was historically attested just over 100 years later" (McIntosh and Bocoum 2000). These changes parallel the transformations that occurred in the Ghana/

Wagadu heartland, the MNV, and Kawkaw/Gao in the same period. Among the changes were innovations in metalworking in MSV towns. Archaeologists have identified more than 300 sites, all dating from the late 10th century and over thirty of them exceeded 25 hectares in area (McIntosh and Boucoum 2000). All of the sites revealed craft production activities of unprecedented scale. Between 900 and 1000 a single trade and artisanal center, focused on the Takrur organization, took shape in the MSV. Crafts, in particular metalworking industries, constituted a social and economic foundation of the ruling dynasty and its adherents (Boucoum 2000). The social logic of the centralization of political authority in the MSV and the political incorporatrion of the Lower and Upper Valleys stimulated craft production to the point that the commercializing (commodification) of the surplus took on considerable significance. An important contributing factor to these developments included surplus transfers from the MNV and the Ghana/Wagadu heartland. In the late 9th and early 10th centuries a new method of copper production, a weaving technology, glass-making and other craft technologies, and luxuries of all kinds entered the Takrur system (Thilsman and Ravise 1980; Boucoum 2000; McIntosh and Boucoum 2000).

Metallurgical sites are among the most dominant features of the MSV landscape. Iron production testifies to the immensity of metalworking activity and the scale of surplus accumulation and centralization in the Takrur tributary system. Archaeological surveys have located up to 60,000 (rural) smelting furnaces concentrated in a 15-kilometer stretch of a *veritable zone métallurgique* that stretched for about 150 kilometers along the MSV floodplain (see Figure 21 above). The earliest furnaces in the zone date from the 9th century, and the entire metallurgical complex remained active until the 14th century. One site alone contained over 400 smelting furnaces, all of which were apparently in simultaneous use by the 11th and 12th centuries (Robert-Chaleix 1989: 253–54, 265; Robert-Chaleix 1993; Garenne-Marot 1996; Cornevin 1998: 257; McIntosh and Boucoum 2000). Metalworking was a mass-production industry and the metallurgical zone would seem to have been specifically organized for export markets.

Contemporaneous with the growth and elaboration of an iron-producing metallurgical zone was the emergence in the towns, after about 900, of a sophisticated copper and copper alloy industry. Both developments coincided with a period of intense metalworking activity in Tegdaoust/Awdaghast, specifically from the 9th to the mid-11th century. In the southern Saharan entrepot objects in copper, copper alloys (especially brass), silver, gold, tin, and lead were being produced on a considerable scale and in great variety. Relations between MSV towns and Tegdaoust/Awdaghast were close and continuous, especially

from the 9th to the 12th century. Copper and silver objects similar to artifacts produced in Tegdaoust/Awdaghast were manufactured in the town of Cubalel between 800 and 900. Copper-based metal artifacts from MSV sites, such as Sincu Bara and Podor, and Tegdaoust/Awdaghast are more similar to each other than they are to any other corpus of West or North African copper-based objects. How is this to be explained? One central factor was the dependence of Tegdaoust/Awdaghast on Awlil salt and fish production and a second was the Saharan city's dependence on MSV agricultural production (Vanacker 1979; McDougall 1983; Polet 1989: 251–52; Garenne-Marot 1996; McIntosh and Boucoum 2000: 34–36).

Excavations of an 11th–12th century burial mound in Sincu Bara and a tumulus near (modern) Podor have brought to light a rich corpus of metal objects, amounting to several thousands. The artifacts, principally of copper and brass, include jewelry, pendants, bells of different shapes and sizes, embossed discs, chains, ornamented bars, weapons, horse trappings, and copper wire currency. Archaeological research indicates that before the 10th century MSV centers had resident metalworking specialists—smiths—and from the late 13th century on they had metalworking specialists. However, between the 10th and 13th centuries, the time of Takrur military and political dominance, there was a different kind of metalworker. The towns ceased to have metalworking specialists in numbers comparable to earlier or later periods. Instead, they had what one archaeologist calls "smith-jewelers." One explanation is that the smith who worked in copper and iron and the jeweler who worked in gold and silver evolved into a single artisan working in these as well as other metals. The urban metalworker became a generalist who produced a wide range of objects in copper and copper alloys. In their operations, smith-jewelers used a whole range of metals—iron, gold, silver, brass, bronze, lead, tin, and zinc. They combined several different metalworking techniques and traditions—derived from smithing and jewelry-making—to produce artifacts in brass-silver, brass-iron, copper-iron, copper-silver-gold, brass-silver-lead-tin, copper-zinc, and copper-zinc-tin. They employed a wide range of techniques—e.g., casting, riveting, and repoussé—and multiple techniques were used on the same artifact—e.g., casting and sheet hammering. The only other place in the world-system where there were smith-jewellers who worked in the same manner was Tegdaoust/Awdaghast. Until the mid-11th century, copper working was an important business and the production of bimetallic objects (copper-iron; gold-silver) and ternary alloys (copper-iron-silver) was a standard practice. However, in Tegdaoust/Awdaghast the smith-jeweler did not replace the smith. Sincu Bara and other MSV towns, as well as Tegdaoust/Awdaghast, imported silver, copper, and brass from the northern Saharan city, Sijilmasa. However between the 9th and the mid-11th century Tegdaoust/

Awdaghast produced brass for export markets. For nearly three centuries smith-jewelers dominated the metalworking industry in the MSV towns. Rural communities continued to have metalworking specialists, or smiths. During the time of Takrur rule, iron production was moved from inside the towns to clustered settlements on their outskirts, or to more distant villages (Vanacker 1979; Thilmans and Ravise 1980; Devisse 1988; Garenne-Marot 1996; Cornevin 1998: 257–59; Levtzion and Hopkins 2000 passim). Archaeological surveys and excavations testify to the dynamism and magnitude of metal working operations in Takrur and the intensity of its long-distance trading connections between the 10th and 13th centuries (see Figures 21 and 22 above). In this period Takrur became a leading exporter of gold to the Mediterranean world.

The era of the smith-jeweler coincided with the rise and expansion of the Almoravid movement and the active participation of the Takrur ruling dynasty in the movement's military campaigns in the Maghrib al-Aqsa and al-Andalus. Through the first half of the 12th century, Takrur remained in a close political and commercial relationship with the northern Almoravids of Marrakush and the southern Almoravids of Azuggi. The relationship enabled the Almoravids—as a movement and as a state organization—to have access to the agricultural, metallurgical, and commercial resources of the Takrur organization. Al-Idrisi's 12th description of the SV is informative:

> Sila on the northern bank of the River Nil [i.e., Senegal] is a metropolis, a meeting place and a good market. Its inhabitants are brave. Sila belongs to the domains of the Takruri, who is a powerful ruler. He has slaves and soldiers, strength and firmness as well as widely-known justice. His country is safe and calm. His place of residence and his capital is the town of Takrur, on the south bank of the Nil. Between that town and Sila is a distance of about two days' traveling by the river or by land. The town of Takrur is larger than Sila, and has more trade. The people of al-Maghrib al-Aqsa go there with wool, copper, and beads, and they export from there gold and slaves (Levtzion and Hopkins 2000: 107).

The intertributary exchanges of the Takrur system extended to al-Andalus. The Maghrib al-Aqsa was linked to the MSV by the famous Triq Lamtuni, a principal trade route that ran from the Dra'a Valley on the northern Saharan fringe to Azuggi, a double-walled *dar al-murabitun* in the southern Sahara, and from thence to Takrur and other MSV centers. At the end of the 11th century the route ran from Guadalquivir in al-Andalus to Takrur, the southernmost *dar al-murabitun* (Hrbek and Devisse 1988: 361–66).

Summary

Archaeological fieldwork in the second half of the 20th century reveals that the Lower Valley and the MSV floodplain has thousands of tells, monumental tombs, and megaliths, dating from the 1st millennium B.C. to the 13th and 14th centuries A.D. The SV emerged as a core zone in the 1st half of the 1st millennium B.C. At the end of the 1st millennium A.D. there was a veritable revolution with respect to the scale of craft production and the development of new craft technologies. The metalworking crafts were the most dramatic of this transformation—in the formation of a vast metallurgical zone and in the emergence of the smith-jeweler. These developments were systemically tied to the Takrur state organization, which dominated the entire SV from the late late 10th century until the late 13th. The ruling dynasty allied itself with the 11th century Almoravid movement, and it participated in the movement's conquests in North Africa and Andalusia.

PART FIVE: THE WESTERN SUDAN WORLD-SYSTEM IV

World-historical change

At the level of the Afro-Eurasian oikumene, the historical dynamic of the Western Sudan world-system is evident in two related phenomena: (1) the Kharijite-Wangara interaction nexus and (2) the Almoravid revolution and movement. The relationships can be defined in terms of ICNs with respect to the former and PMNs with respect to the latter. Under the general rubric "The routes of al-Andalus" two recent essays, which form part of an ongoing UNESCO "Intercultural Dialogue" project, present challenging perspectives concerning these relationships and raise questions that need to be addressed. One essay, "Al-Andalus: Scientific Heritage and European Thought", is written by Pierre Philippe Rey and the other, "The Almoravids: An Afro-Iberian Hegemony", is by Yoro K. Fall. The routes comprised first of all a route through an upheaval in thought (on which al-Andalus was founded) and, relatedly, a second route through an economic and demographic transformation. The new line of thought originated in North and West Africa and the economic and demographic changes were tied to the expansion of caravan traffic on trans-Saharan trade routes in the 8th and 9th centuries and the rise of the Almoravid monetary system in the late 11th century (Anonymous 1997).

In his description of the first of the Andalusian routes, Rey posits a bold and unorthodox thesis. He refers to a "veritable 'road of universalist rationality'" which, he argues, should be explored as systematically as the silk road and the routes traveled by gold and spices are studied. He begins thus:

> Al-Andalus, lying to the north of the Maghrib, to the south of Europe, is the heir to the rationalist, philosophical, and scientific thought of ancient Persia and Greece, reformulated in the light of the universalism born of the fertile dialectic between the three great monotheistic religions whose coexistence it made possible. It was this new universalist rationalism that al-Andalus transmitted to North Europe, either directly or via Sicily, its twin sister. One figure more than any other marks this Andalusian origin of European rationalism: that of Ibn Rushd, Averroës, physician, jurist, and philosopher (Rey n.d.).

The Muslim West asserted a reformulation of universalist rationalist thought that enabled it to take the place of the Abbasid-dominated East in leading the way in science and philosophy. The first stage of the new universalist rationalist thought originated in West and North Africa. In his account of the history of universal rationality, Rey lays particular stress on the intellectuality of Kharijite religious-philosophical culture and its ICNs. By the 8th century, he writes, the "scientific and technical achievements of Greece and Persia had been reformulated and developed by this dissident current of Islam established in the Maghrib." The Kharijites combined commerce and scholarship: the merchant was also a man of learning. Rey's starting point for an understanding of 12th century Andalusian intellectual life is the Kharijite North African and Kharijite West African connection. He maintains that the scholarly achievements of Averroës, or Ibn Rushd (1126–1198), represent the culmination of a lengthy social process, a process whose starting point was the Maghrib-Western Sudan nexus of the 8th century. The road of universalist rationalism passed through Tahart, an important Ibadi imamate in the northern Sahara, into the world of Wangara exchange networks (Lewicki 1960; Lewicki 1962; Lewicki 1971a; Devisse 1988). The Kharijite interaction network, he comments, is "a fact deeply etched in the history of Muslim philosophy." During the period of intense interaction between Wangara West Africa, Kharijite North Africa, and Umayyad Spain the Andalusian culture that would flourish in the following centuries was formed (Rey n.d.; also Benaboud 1987; for al-Andalus as "the hinge of medieval philosophy" see Collins 1998: 428–50). Rey's recovery of a specific Kharijite-Wangara ICN places the Western Sudan world-system in a hitherto unacknowledged position within the western Islamic world and, by extension, the Afro-Eurasian oikumene (Rey, n.d.; Anonymous 1997; also Haidara n.d.).

According to R. McIntosh, non-Muslim Wangara traders were not simply distributors of commodities they were also organic intellectuals who had their ICNs. Wangara praxis entailed a unity of commerce and learning. McIntosh offers details:

> [They] served the important purpose of transmitting over long distances a major constellation of Mande beliefs about the nature of authority and about the powers of the earth. Later as the first long-distance [Ibadi] Muslims, they provide the critical function of discovering a working synthesis of older traditions, symbols, and esoteric views of causation with the new religion. These are not just traders in gold. They traffic also in power of beliefs and esoterica. Secret, peripatetic, competent in the occult, the Wangara provide an important role in the creation and transmission of the new canons of authority and new expressions of power that we call the Imperial Tradition (McIntosh 1998: 281).

In this account the Wangara appear as bearers and articulators of different kinds of knowledge that circulated in the symbolic space of the Western Sudan world-system. Wangara resident in different urban centers, including Koumbi Saleh, Tadmakka, Kawkaw/Gao, Dia, and Tegdaoust/Awdaghast, joined the Kharijite social and intellectual movement in the 8th and 9th centuries. In the Western Sudan Kharijite-Wangara knowledge production and learning took place under the domination of the Ghana/Wagadu and Kawkaw/Gao surplus-appropriating regimes and against a social background of urbanism, population growth and maximum site development in the MNV, expanding trade, construction on a monumental scale, and deepening social stratification. Kharijite-Wangara discourse and intellectual praxis advocated, according to some interpretations, universality and diversity. These values cannot be separated from the political economy in which they were enmeshed. The promotion of commerce constituted a material basis of universality and the promotion of craft skills was a material basis of diversity (Anonymous 1997; cf. Ennami 1970).

The other connections between al-Andalus and the Western Sudan world-system formation were organized around economic and demographic transformations. In his discussion of the origins and development of the anti-Kharijite Almoravid movement and its state building project (1039/40–1147), Yoro Fall offers the following analysis.

> [T]he movement developed very rapidly in the form of a coalition with Takrur [between 1052–54], a newly islamized state in the Senegal valley. It would seem probable that most of the other city-states of the Senegalo-Nigerian Sahel also formed part of this coalition. Within two decades, from the south to the north, the towns and principalities of the western regions of the Sahel and the Sahara, which took an active part in controlling the trans-saharan routes, were placed under the Almoravid administration.... [T]hey contributed to the establishment of a Muslim Sahelo-Maghribi area centered on urban cultures (Fall n.d.; cf. Farias 1967; Clarke 1982, chapter 2).

The "other city-states" would have included urban clusters of the MNV as well as places like Koumbi Saleh, Kawkaw/Gao, and Kukiya (Lange 1991; Lange 1994; Hunwick 1994; Insoll 1996; Insoll 2000; also Hrbek and Devisse 1988: 354–61; Insoll 1996; Insoll 2000).

The movement began in the WS among transhumant camel pastoralists, caravaneers, and merchants organized in social-political collectives (the Lamtuna, the Gudala, the Lamta, and the Massufa) which constituted branches of the Sanhaja formation. The roles of these collectives in the inter-tributary (surplus) exchanges between the state organizations of the Maghrib and the core zones of the Western Sudan gave them a certain "vocation" to take decisive initiatives at particular historical moments. The initiatives included: (1) politically unifying immense territories by military means; (2) situating themselves in the heart of ideological initiatives (e.g., the Kharijite-Sunni controversy), and (3) having the capacity to place themselves in central positions in a tributary system (cf. Amin 1993: 259–60; also Farias 1967; Norris 1982, chapter 7; McDougall 1983; Lange 1991). The movement transformed the WS periphery into an expansionist and centralizing core zone. Its northern wing, with its capital at Marrakush, successfully established a surplus centralizing tributary system in the Maghrib and Andalusia in the second half of the 11th century. The southern, or Saharan, wing, with its capital at Azuggi, returned to a periphery status as a surplus redistributing formation within the Ghana/Wagadu and Takrur tributary systems during the same period (Farias 1967). In its origins the Almoravid revolution and movement were clearly a phenomenon of the Western Sudan world-system.

The geographer Yaqut (1179–1229) throws some light on 12th century Almoravid-Western Sudan relations. Writing about Zafun(u) (Diafunu), a powerful polity allied with the Ghana/Wagadu political system (see Figure 7), he states that the Zafun(u) ruler was more powerful than the Almoravid rulers of Marrakush and was "more versed in the art of kingship. The veiled people [i.e., the Almoravids] acknowledge his superiority over them, obey him, and resort to him in all important matters of government." Al-Zuhri provides information of a different sort. In his account of the "town of Ghana", i.e., Koumbi Saleh, he mentions "scholars, lawyers, and Koran readers [who] have become pre-eminent in these fields." The geographer visited various Andalusian towns between 1137 and 1154, and during the course of his travels he met 'ulama' from the Ghana capital (Levtzion and Hopkins 2000: 93, 98). He also acknowledges that many army commanders from the "town of Ghana" travelled to al-Andalus. Presumably, their purpose was to join Almoravid military forces such as the Hasham organization in order to engage in the holy war against the Christians of northern Iberia. Dating from the days of the Umayyad Caliphate

of Cordova, the organization comprised "salaried troops paid in money and recruited outside Spain, whether Europeans or Africans, white or black" (Hopkins 1958: 74–75; Hadj-Sadok 1968: 95; Lewicki 1971b; Norris 1982: 134; Clarke 1982: 20–22; Hrbek and Devisse 1988: 356; Levtzion and Hopkins 2000: 98, 170). Like other contemporary sources, Al-Zuhri's references to Sudani in Almoravid Spain indicate that considerable numbers of 'ulama', artisans, soldiers, and others from the Western Sudan system traveled to and settled in the Maghrib and al-Andalus in the days of Almoravid and Almohad suzerainty (ca. 1062–1269) (Hopkins 1958: 74–78, 92–93; Talbi 1984: 57–58; Johnson 1994; for references to a pre-11th century Western Sudan military presence in the Muslim armies of the Maghrib and Andalusia see The Song of Roland 1960; Brett 1969; Johnson 1994, chapters 2 and 3; Levtzion and Hopkins 2000: 39; also Devisse 1979; Devisse and Mollat 1979; Páez 1999).

Yoro Fall draws attention to the historical relevance of the Almoravid project, as a cultural, demographic, economic, and political phenomenon within Islam of the West:

> The Almoravid hegemony represents the only historical experience, albeit ephemeral, of political integration ever formed between West Africa, the Maghrib, and the Iberian Peninsula…. However, it is their architectural and artistic achievements, as well as their role in the cross-cultural influences between Spain, the Maghrib, the Sahara, and the Sahel, which stand out among the cultural contributions made by the Almoravids…. The Almoravid hegemony thus contributed to the proliferation and merging of the intercultural routes of al-Andalus and to their extension to the Saharan and Sahelian regions of West Africa. Marrakech, their capital, was greatly influenced by Andalusian culture. Power and wealth flowed into al-Andalus from the south, and after the first centuries of Shiite or Kharijite Islamisation, the caravan routes became vectors for the spread of Sunnism (Fall n.d.; also Blier 2004: 187, 189–92).

A material foundation of the Almoravid achievement was the gold trade. Fall makes the point that Almoravid gold dinars, "the famous *marabotins*, coins of the finest quality, were the currency of the period. This led to the Almoravids being considered by their African, Mediterranean, and European contemporaries as one of the greatest powers of that period" (Fall n.d.; also Spufford 1993: 165). R.A. Messier spells out the implication of this statement. The Almoravid regime, he relates, played a key role in the exploitation of the gold sources of the Western Sudam world-system and in the circulation of that gold—not only within the Almoravid empire itself, but also in "southern Europe, in Egypt, and perhaps even in the Far East" (Messier 1974: 41; also Devisse 1988; Hrbek and Devisse 1988; Spufford 1993:165–66, 167–70; Miller 2001; Blanchard 2001; Gondonneau and Guerra 2002). The Almoravid project and the circulation of gold in a wide area of the oikumene cannot be separated from the social production of the Western Sudan world-system.

Ian Blanchard adds another dimension to the nature of the gold trade in the oikumene. He explains that the years 1125/30–1175 saw the emergence of a distinct North African zone of cheap and plentiful gold extending from the Atlantic to the Red Sea. He attributes this phenomenon to technological changes in the production base of the Western Sudan gold industry and to developments in the trans-Saharan trade system. The exchange of African gold and equally cheap and plentiful Western Eurasian silver created a situation that encouraged and engendered the emergence of a distinctive Afro-Western Eurasian bullion market structure that was characterized by long-term price stability and an "anti-cyclonic" distribution of the two metals. During the first great output long cycle (1125/30–1225) Western Eurasian silver and African gold production rose to a position of dominance in the oikumene. He states further that the changes in trade and in the Western Sudan gold industry permanently established the industry's position in inter-continental monetary-commercial system for the next four hundred years (Blanchard 2001; also Spufford 1993: 170–86; Insoll 1996).

Summary

The "Routes of Al-Andalus" project draws attention to two world-historical connections of the Western Sudan world-system. One connection was the interchange of ideas (value systems) and wealth (ICNs and PGNs) between Wangara Western Sudan, Kharijite North Africa, and Umayyad Andalusia in the 9th and 10th centuries, which contributed to the flourishing of Andalusian cultural and intellectual life in the 11th and 12th centuries. The emergence and consolidation of the Almoravid movement was a phenomenon that was internal to the Western Sudan world-system. As a political regime the Almoravid played a key role in the circulation of Western Sudan gold within an inter-continental commercial-monetary system.

abbreviations

BGN, bulk goods network
ICN, information-cultural network
MNV, Middle Niger Valley
MSV, Middle Senegal Valley
PGN, prestige goods network
PMN, political-military network
SV, Senegal Valley
WS, Western Sahara
WSa, Western Sahil

BIBLIOGRAPHY

Abu-Lughod, Janet L. (1989), *Before European Hegemony. The World System A.D. 1250–1350* (New York and Oxford: Oxford University Press).

"African Legacy" (n.d.), http://apollo5.bournemouth.ac.uk.

Ajayi, J.F. Ade and Michael Crowder (editors) (1985), *History of West Africa*, vol.1. (Harlow: Longman Group Ltd.).

Amin, Samir (1980), *Class and Nation, Historically and in the Current Crisis*. Translated by Susan Kaplow (New York and London: Monthly Review Press).

Amin, Samir (1989), *Eurocentricism*. Translated by Russell Moore (New York: Monthly Review Press).

Amin, Samir (1993), "The Ancient World-Systems versus the Modern Capitalist World-System" in Frank and Gills: 247–77.

Amin, Samir (1998), *Globalization in the Age of Globalization. The Management of Contemporary Society* (London and New York: Zed Books).

Andah, Bassey W. et al (editors) (1998), *Africa: The Challenge of Archaeology* (Ibadan: Heinemann Educational Books (Nigeria) PLC).

Anonymous (1997), "Interregional meeting on 'Routes of al-Andalus: places of encounter for intercultural dialogue', Granada, Spain, 27–30 September," http://www.unesco.org/culture/al-andalus/html_eng/.

Arazi, Noemie (1999), "An Archaeological Survey in the Songhay Heartland of Mali," *Nyame Akuma* no. 52: 25–43.

Aumassip, Ginette (1996), "L'Afrique de l'Ouest Préhistorique d'après les Données Récentes" in *La Préhistorie*: 7–20.

Barendse, R.J. (2003), "The Feudal Mutation: Military and Economic Transformations of the Ethnosphere in the Tenth to the Thirteenth Centuries," *Journal of World History* vol. 14 no. 4: 503–29.

Barth, Hans Karl (1976), "Zum Alter der Grab-und Siedlungshügel im Binnendelta des Niger, Mali," *Paideuma* vol. 22: 231–35.

Barth, Hans Karl (1977), "L'Age de la Civilisation des Tumulus et des Anciens Habitats du Delta Intérieur du Niger (Mali)," *Notes Africaines* no. 155: 57–61.

Becker, Charles and Hamady Bocoum (2000), "Manifestations of Urbanisation in Senegambia: Situation Report" in Andah et al:143–70.

Bedaux, R.M.A. (1972), "Tellem, Reconnaissance Archéologique d'une Culture de l'Ouest Africain au Moyen Age: Recherches Architectonic," *Journal de la Société des Africanistes* vol. 52, fasc. 11: 107–85.

Bedaux, Rogier et al (2001), "The Dia Archaeological Project: Rescuing Cultural Heritage in the Inland Niger Delta (Mali)," *Antiquity* vol. 75, no. 290: 837–48.

Benaboud M'hammed (1987), "Historiography in Al-Andalus during the Period of the Taifa States (XIe Century A.D.)," *Hespéris-Tamuda* vol. 25: 5–32.

Berthier, Sophie (1997), *Recherches Archéologiques sur la Capitale de l'Empire de Ghana*, BAR International Series 680 (Oxford: Hadrian Books, Ltd.).

Blanchard, Ian (2001), *Mining, Metallurgy, and Minting in the Middle Ages*, 2 vols. (Stuttgart: Franz Steiner Verlag).

Blier, Suzanne Preston (2004), "Butabu: Adobe Architecture of West Africa" in Morris: 185–216.

Bocoum, Hamady (2000), *L'Âge du Fer au Sénégal. Historie et Archéologie* (Dakar: IFAN Ch.A. Diop).

Bonnel de Mézières, A. (1914), "Note sur les Récentes Découvertes," *Comptes Rendus des Scéances de l'Académie des Inscriptions et Belles-Lettres* (Paris): 253–57.

Bonnel de Mézières, A. (1914–16), "Découverte de l'Emplacement de Tirekka," *Bulletin du Comité des Travaux Historiques et Scientifiques* vols. 29–31 (Paris): 132–35.

Bosworth, Andrew (1995), "World Cities and World Economic Cycles" in Sanderson: 206–27.

Brett, Michael (1969), "Ifrīqiya as a Market for Saharan Trade from the Tenth to the Twelfth Century A.D. *Journal of African History* vol. 10, no.3: 347–64.

Brooks, George E. (1998), "Climate and History in West Africa" in Connah: 139–59.

Chase-Dunn, Christopher and Thomas Hall (1992), "World-systems and Modes of Production: Toward the Comparative Study of Transformations," *Humboldt Journal of Social Relations* vol. 18, no.1: 81–117.

Chase-Dunn, Christopher and Thomas D. Hall (1995), "Cross World-System Comparisons. Similarities and Differences" in Sanderson: 109–35.

Chase-Dunn, Christopher and Thomas Hall (1997), "Ecological Degradation and the Evolution of World-Systems," *Journal of World-Systems Research* 3,3:403–31. http://jwsr.ucr.edu/

Chasseurs et Guerriers(1998), Exposition: Musées Dapper, Paris 30 Avril-30 Septembre 1998 (Paris: Éditions Dapper).

Cheikh, Abd El Wedoud ould and Bernard Saison (1985), "Le Théologien et le Somnambule: Un Épisode Récent de l'Histoire Almoravide en Mauretanie" in Jewsiewwicki and Triaud: 301–17.

Chieze, Valérie, (1991), "La Métallurgie du Fer dans la Zone Lacustre. Archéologie-Archéométrie" in Raimbault and Sanogo: 449–72.

Christides, Vassilios (2000), *Byzantine Libya and the March of the Arabs towards the West of North Africa*, BAR International series 851 (Oxford: Hadrian Books Ltd.).

Cissé, Youssouf Tata (1998), "Cavaliers et Chevaux de Guerre du Mali" in *Chasseurs et Guerriers*: 71–129.

Clapier-Valladon, Dr. V. and Mme S. Clapier-Valladon (1961), "Les Ruines de Settah (Mauritanie), *Notes Africaines* no. 89: 1–4.

Clark, Mary and Harold Hietala (2002), "Analytic Approach to Understanding Settlement Organization Represented by Nucleated Site Clusters, Inland Niger Delta, Mali" in "Abstracts of the 16th Biennial Conference of the Society of Africanist Archaeologists, Tucson, Arizona, May 18–22, 2002," *Nyame Akuma* no. 57: 47.

Clarke, Peter B. (1982), *West Africa and Islam: A Study of Religious Development from the 8th to the 20th Century* (London: Ed. Arnold).

Collins Randall (1998), *The Sociology of Philosophies. A Global Theory of Intellectual Change* (Cambridge and London: Harvard University Press).
Connah, Graham (editor) (1998), *Transformations in Africa. Essays on Africa's Later Past* (London and Washington: Leicester University Press).
Connah, Graham (2000), *African Civilizations. An Archaeological Perspective* (Cambridge: Cambridge University Press, 2nd ed.).
Cornevin, Marianne (1998), *Secrets du Continent Noir Révélés par l'Archéologie* (Paris: Maisonneuve et Larosse).
Darling, Patrick (1998), "A Legacy in Earth—Ancient Benin and Ishan, Southern Nigeria" in Wesler: 143–97.
Darling, Patrick B. (2000), "Does Size Matter? The Case of Nigeria's Visible Archaeology" in "Abstracts from the 15th Biennial Meeting of the Society of Africanist Archaeologists, Cambridge, UK, July 12–15, 2000," *Nyame Akuma* no. 54: 30–40
De Grunne, Bernard (1980), *Ancient Terracottas from West Africa* (Louvain-La-Neuve: Institut Supérier d'Archéologie et d'Historie de l'Art)
De Grunne, Bernard (1981), *Ancient Treasures in Terra Cotta of Mali and Ghana* (New York: The African-American Institute).
Delafosse, Maurice (1920),"Des Soi-Disant Clans Totémiques de l'Afrique Occidentale," *Revue d'Ethnographie et des Traditions Populaires* vol. 1, no. 2: 87–107.
Dembélé, Mamadi (1991a), "Les Missions Léré—Faguibine (1981–1983)" in Raimbault and Sanogo: 63–80.
Dembélé, M., (1991b), "La Prospection en Zone Lacustre (1984)" In Raimbault and Sanogo: 185–89.
Deme, Alioune Abu (2002), "New Archaeological Research on Social Complexity in the Middle Senegal Valley: Prelimiary Results from Walaldé (Senegal)" in "Abstracts of the 16th Biennial Conference of the Society of Africanist Archaeologists, Tucson, Arizona, May 18–22, 2002," *Nyame Akuma* no. 57: 49.
Descamps, Cyr (1981), "Note sur le Mégalithisme Sénégambien" in Perrot et al: 29–36.
Desplagnes, Louis (1903), "Étude sur les Tumuli du Killi dans la Région de Goundam," *L'Anthropologie* vol. 14: 151–69.
Desplagnes, Louis (1907), *Le Plateau Central Nigérien* (Paris: Émile Larousse).
Desplagnes, Louis (1951), "Fouilles du Tumulus d'El Ouledji (Soudan)," *Bulletin de l' Institut Francais l'Afrique Noir* vol. 29: 1159–73.
Devisse, Jean (1979), *The Image of the Black in Western Art* vol. 2, part 1 (Cambridge: Harvard University Press).
Devisse, Jean (1988), "Trade and Trade Routes in West Africa" in Elfasi and Hrbek: 367–435.
Devisse, Jean and Michel Mollat (1979), *The Image of the Black in Western Art* vol. 2, part 1 (Cambridge: Harvard University Press).
Devisse, Jean et al (1983), *Tegdaoust III: Recherches sur Aoudaghost. Campagnes, 1960–1965* (Paris: ADPF).

Diop, Alioune (2001), "New Archaeological Research on Complex, Metal-Using Societies in the Middle Senegal Valley: Preliminary Results from Walalde (Senegal)." Paper presented at the annual meeting of the African Studies Association, 15–18 November, Houston, TX.
Djaït, Hichem (1973), "L'Afrique Arabe au VIII Siècle (86–184 H/705–800)," *Annales* 28e Années, no.3: 601–21.
El Ajlaoui, El Moussaoui (1994), "La Mine d'Argent et la Question de Todgha (VIIIème Siècle- Xème): Vers une Hypothèse," *Hespéris-Tamuda* vol. 32: 11–33.
Elfasi, M. and I, Hrbek (editors) (1988), *General History of Africa III: Africa from the Seventh to the Eleventh Century* (Berkeley: University of California Press).
El-Rashdy, F. (1986), "Garamantian Burial Customs: Their Relation to Those of Other Peoples of North Africa" in *Libya Antiqua*: 77–105.
Ennami, A.K. (1970), "A Description of New Ibadi Manuscripts from North Africa," *Journal of Semitic Studies* vol. 15: 63–87.
Fall, Yoro K. (n.d.), "The Almoravids: An Afro-Iberian Hegemony," http://www.unesco.org/culture/al-andalus/html_eng/fall.shtml.
Farias, Paulo Fernando de Moraes (1967), "The Almoravids: Some Questions concerning the Character of the Movement during its Periods of Closest Contact with the Western Sudan," *Bulletin de l' Institut Fondamental l'Afrique Noir* vol. 29: 794–878.
Farias, P.F. de Moraes (1974), "Du Nouveau sur les Stéles de Gao: les Épitaphes du Prince Yama Kuri et du Roi F.n.da (XIIIe Siècle)," *Bulletin de l' Institut Francais l'Afrique Noir* vol. 36: 511–24.
Farias, P.F. de Moraes (1990), "The Oldest Extant Writing of West Africa: Medieval Epigraphs from Essuk, Saney, and Egef-n-Tawaqqast (Mali)," *Journal des Africanistes* vol. 60, no. 2: 65–113.
Fenn, Thomas R. (2002), "The Copper Metallurgy of the Western Sahel: A Reassessment of the Evidence in Light of New Data from Senegal" in "Abstracts of the 16th Biennial Conference of the Society of Africanist Archaeologists, Tucson, Arizona, May 18–22," *Nyame Akuma* no. 57: 51.
Flight, Colin (1975), "Gao, 1972: First Interim Report. A Preliminary Investigation of the Cemetery at Sané," *West African Journal of Archaeology* vol. 5: 81–90.
Fontes, P.-B. et al, "Prospection de Sites Archéologiques de la Région des Lacs et du Delta Intérieur du Niger (1980)" in Raimbault and Sanogo: 27–61.
Frank, Andre Gunder and Barry K. Gills (editors) (1993), *The World System. Five Hundred Years or Five Thousand?* (London and New York: Routledge).
Gado, Boubé (1986), "Possible Contacts between the Central Valley of the Nile and the River Niger Area" in *Libya Antiqua*: 187–242.
Gallais, Jean (1962), "Signification du Groupe Ethnique au Mali," *L'Homme*: 106–29.
Garenne-Marot, Lawrence (1996), "Organization of Metalworking Societies in 'Medieval' West Africa: The Smith of Sintiou Bara (Senegal)" in Pwiti and Soper: 523–32.
Gills, Barry K. and Andre Gunder Frank (1993), "World System Cycles, Crises, and Hegemonic Shifts, 1700 BC to 1700 AD" in Frank and Gills: 143–99.

Glick, Thomas F. (1979), *Islamic and Christian Spain in the Early Middle Ages* (Princeton: Princeton University Press).
Gondonneau, A. and M.F. Guerra (2002), "The Circulation of Precious Metals in the Arab Empire: The Case of the Near and the Middle East," *Archaeometry* vol. 44, part 4: 573–99.
Grebenart, Danilo (1996), "Les Premiers Métaux en Afrique de l'Ouest" in *La Préhistoire*:75–82.
Guèye, Ndeye Sokhna (2002), "Les Datations du Site de Thiehel: Evaluation des Implications sur la Question du Peuplement de la Moyenne Vallée du Fleuve Senegal" in "Abstracts of the 16th Biennial Conference of the Society of Africanist Archaeologists, Tucson, Arizona, May 18–22," *Nyame Akuma* no. 57: 53.
Hadj-Sadok, M. (1968), "Kitāb al-Dja'rāfiyya," *Bulletin d'Études Orientales* vol. 21: 17–110.
Håland, Randi (1980), "Man's Role in the Changing Habitat of Mema during the Old Kingdom of Ghana," *Norwegian Archaeological Review* vol. 13, no. 1: 31–46.
Haidara, Ismael Diadie (n.d.), "Las Relaciones Subsaharianas se Al-Andalus durante el Siglo X," http://www.zawiya.org.
Hall, Thomas D. (1996), "World-Systems and Evolution," *Journal of World-Systems Research* 2,4: 1–43. http://jwsr.ucr.edu/
Hall, Thomas D. (editor) (2000), *A World-Systems Reader. New Perspectives on Gender, Urbanism, Cultures, Indigenous Peoples, and Ecology* (Lanham: Rowland & Littlefield Publishers, Inc.).
Hall, Thomas D. and Christopher Chase-Dunn (1993), "The World-Systems Perspective and Archaeology: Forward into the Past," *Journal of Archaeological Research* vol.1, no. 2: 121–43.
Hill, Polly (1971), "Two Types of West African House Trade" in Meillassoux: 303–18.
Holl, Augustin (1985), "Background to the Ghana Empire: Archaeological Investigations on the Transition to Statehood in the Dhar Tichitt Region (Mauritania)," *Journal of Anthropological Archaeology* vol. 4: 73–115.
Holl, Augustin (1993), "Late Neolithic Cultural Landscape in Southeastern Mauritania: An Essay in Spatiometrics" in Holl and Levy: 95–133.
Holl, Augustin and Thomas E. Levy (1993), *Spatial Boundaries and Social Dynamics. Case Studies from Food-Producing Societies* (Ann Arbor: International Monographs in Prehistory).
Hopkins, J.F.P. (1958), *Medieval Muslim Government in Barbary until the Sixth Century of the Hijra* (London: Luzac & Company Ltd).
Hrbek, I and J. Devisse (1988), "The Almoravids" in Elfasi and Hrbek: 336–66.
Hunwick, John O. (1968), "The Term 'Zanj' and its Derivatives in a West African Chronicle," *Research Bulletin. Center of Arabic Documentation* vol. 4: 41–51.
Hunwick, John (1994), "Gao and the Almoravids Revisited: Ethnicity, Political Change, and the Limits of Interpretation," *The Journal of African History* vol. 35, no. 2: 251–73.

Ilevbare, J.A. (1986), "Potential Contact between the Central Valley of the Nile and the River Niger Area in the First Seven Centuries of the Christian Era" in *Libya Antiqua*: 179–86.
Insoll, Timothy (1996), *Islam, Archaeology and History. Gao Region (Mali) ca. AD 900–1250*, BAR International Series 647 (Oxford: Hadrian Books Ltd.).
Insoll, Timothy (1999), *The Archaeology of Islam* (Malden and Oxford: Blackwell Publishers).
Insoll, Timothy (2000), *Urbanism, Archaeology, and Trade. Further Observations on the Gao Region (Mali). The 1996 Fieldseason Results* (Oxford: Hadrian Books Ltd.).
Jewsiewicki, Bogumil and Jean-Louis Triaud (editors) (1985), *Islamic Leaders in West Africa* (Quebec: Safi and ACEA/CAAS).
Insoll, T. and T. Shaw (1997), "Gao and Igbo-Ukwu: Beads, Inter-Regional Trade and Beyond," *African Archaeological Review* vol. 14: 9–23.
Johnson, Catherine Theresa (1994), "The Representation of Blacks in Medieval German Literature and Art," Ph.D. dissertation, The University of Michigan.
Khattar, Mohamed Ould (1996), "Découverte d'un Âge Ancien du Fer en Mauritanie" in *La Préhistoire*: 85–90.
Killick, David J., Thomas R. Fenn, and Alioune Abu Deme (2002), "The Evidence for Metallurgy at Walaldé, Senegal, and Its Implications for the Origins of Metallurgy in the Western Sahel" in "Abstracts of the 16th Biennial Conference of the Society of Africanist Archaeologists, Tucson, Arizona, May 18–22," *Nyame Akuma* no. 57: 58.
Kreuger, Himar C. (1938), "The Wares of Exchange in the Genoese-African Traffic of the Twelfth Century" *Speculum* vol.12, no.1: 57–71.
Kuba, Richard (2000), "Cultural Contacts between the Savanna and the Forest: Trade along the River Niger" in "Abstracts from the 15th Biennial Meeting of the Society of Africanist Archaeologista, Cambridge, UK, July 12–15," *Nyame Akuma* no. 54: 49.
Lacoste, Yves (1974), "General Characteristics and Fundamental Structures of Medieval North African Society," *Economy and Society* vol. 3, no. 1: 1–17
Lambert, Nicole (1970), "Medinet Sbat et la Protohistoire de Mauritanie Occidentale,"
Antiquités Africaines vol. 4: 15–62.
Lambert, Nicole (1981), "L'Apparition du Cuivre dans les Civilisations Préhistoriques" in Perrot et al: 213–26.
Lange, Dierk (1991), "Les Rois d'Gao-Sané et les Almoravides," *The Journal of African History* vol. 32, no. 2: 251–75.
Lange, Dierk (1994), "From Mande to Songhay: Towards a Political and Ethnic History of Medieval Gao," *The Journal of African History* vol. 35, no. 2: 275–301.
Last, Murray (1985), "The Early Kingdoms of the Nigerian Savanna" in Ajayi and Crowder: 167–224.
Lessard, Jean-Michel (1969), "Sijilmasa. La Ville et Ses Relations Commerciales au XIe Siècle," *Hesperis-Tamuda*vol. 10: 5–35.

Levtzion, Nehemia (1980), *Ancient Ghana and Mali* (New York and London: Africana Publishing Company).
Levtzion, Nehemia (1985), "The Early States of the Western Sudan" in Ajayi and Crowder: 129–66.
Levtzion, N. and J.F.P.Hopkins (editors) (2000), *Corpus of Early Arabic Sources for West African History* (Princeton: Markus Wiener Publishers).
Lewicki, Tadeusz (1960), "Quelques Extraits Inédits relatifs aux Voyages des Commerçants Ibadites Nord-Africains au Pays du Soudan Occidental et Central au Moyen Age," *Folia Orientalia* vol. 2: 1–27.
Lewicki, Tadeusz (1962), "L'État Nord-Africain de Tahert et ses Relations avec le Soudan Occidentale à la Fin du VIIIe et au IXe Siècle," *Cahiers d'Études Africaines* vol. 8: 513–35.
Lewicki, Tadeusz (1971a), "The Ibadites in Arabia and Africa," *Cahiers d'Histoire Mondiale*: 3–130.
Lewicki, Tadeusz (1971b), "Un État Soudanais Médiéval Inconnu: le Royaume de Zafun(u)," *Cahiers d'Études Africaines* vol.11: 501–25.
Lewicki, Tadeusz (1971c), "Une Croyance des Ibadites Nord-Africains sur la Fin du Monde: Le Pays de Gugraf, *VCongrès Internationale d'Arabisants et d'Islamisants(Brussels): 317–27.*
Lewicki, Tadeusz (1974), *West African Food in the Middle Ages* (London and New York: Cambridge University Press).
Lewicki, Tadeusz (1981), "Les Origines et l'Islamisation de la Ville de Tadmakka d'après les Sources Arabes" in Perrot et al: 439–43.
Libya Antiqua(1986). Report and papers of the symposium organized by Unesco in Paris. 16 to 18 January 1984 (Paris: Unesco).
Liverani, Mario (2000a), "The Garamantes: A Fresh Approach," *Libyan Studies* vol. 31: 17–28.
Liverani, Mario (2000b), "The Libyan Caravan Road in Herodotus IV. 181–184," *Journal of the Economic and Social History of the Orient* vol.43, no.4: 496–520.
Lhote, H. (1972), "Une Étonnante Découverte Archéologie au Niger," *Archeologia* no. 51 (1972): 63–67.
MacDonald, K.C. (1996), "Tichitt-Walata and the Middle Niger: Evidence for Cultural Contact in the Second Millennium B.C." in Pwiti and Soper: 429–40.
MacDonald, K.C. (1998), "Before the Empire of Ghana: Pastoralism and the Origins of Cultural Complexity in the Sahel" in Connah: 71–103.
MacDonald, Kevin (n.d.), "Ancient African Civilizations," http://www.africana.com.
Magnavita, Sonja and Christoph Pelzer (2000), "Tombs of Kissi: Archaeological Evidence of Early Trade Contacts in Northern Burkino Faso" in "Abstracts from the 15th Biennial Meeting of the Society of Africanist Archaeologists, Cambridge, UK, July 12–15," *Nyame Akuma* no. 54: 51.
Magnavita, Sonja (2002a), "Kissi and the Trans-Saharan Trade" in Abstracts from the 16th Biennial Conference of the Society of Africanist Archaeologists, Tucson, Arizona, May 18–22," *Nyame Akuma* no. 57: 61.

Magnavita, Sonja (2002b), "The Beads of Kissi: Trade, Wealth, and Treasures" in Abstracts from the 16th Biennial Conference of the Society of Africanist Archaeologists, Tucson, Arizona, May 18–22," *Nyame Akuma* no. 57: 62.
Mauny, Raymond (1950), "Villages Neolithiques de la Falaise (Dhar) Tichitt-Oualata," *Note Africaines* vol. 50: 35–43.
Mauny, Raymond (1951), "État Actuel de la Question de Ghana," *Bulletin de l' Institut Francais l'Afrique Noir* vol. 13: 463–75.
Mauny, Raymond (1967), *Tableau Géographique de l'Ouest Africain au Moyen Age d'après les Sources Écrits, la Tradition et l'Archéologie* (Amsterdam: Swets & Zeitlinger N.V.).
Mauny, Raymond (1970), *Les Siècles Obscurs de l'Afrique Noire. Histoire et Archéologie* (Fayard).
Mauny, R. (1971), "The Western Sudan" in Shinnie: 66–87.
McDougal, E. Ann (1983), "The Sahara Reconsidered: Pastoralism, Politics, and Salt from the Ninth through the Twelfth Century," *African Economic History* vol. 12: 263–86.
McIntosh, Roderick J. (1991), "Early Urban Clusters in China and Africa: The Arbitration of Social Ambiguity," *Journal of Field Archaeology* vol. 18: 199–212
McIntosh, Roderick James (1998), *The Peoples of the Middle Niger* (Malden and Oxford: Blackwell Publishers).
McIntosh, Roderick James and Susan Keech McIntosh (1981), "The Inland Niger Delta Before the Empire of Ghana: Evidence from Jenne-Jeno," *The Journal of African History* vol. 22: 1–22.
McIntosh, R.J. and S. Keech McIntosh (1991), "Reconnaissances Archéologiques le Long du Moyen-Niger" in Raimbault and Sanogo," pp. 99–120.
McIntosh, Susan Keech (1981), "A Reconsideration of Wangara/Palolus, Island of Gold," *The Journal of African History* vol. 22: 145–58.
McIntosh, Susan Keech (1994), "Changing Perceptions of West Africa's Past: Archaeological Research Since 1988," *Journal of Archaeological Research* vol. 2, no. 2, pp, 165–97.
McIntosh, Susan Keech (editor) (1995), *Excavations at Jenné-Jeno, Hambarketolo, and Kaniana (Inland Niger Delta, Mali), the 1981 Season* (Berkeley: University of California Press).
McIntosh, Susan Keech (n.d.), "A Tale of Two Floodplains: Comparative Perspectives on the Emergence of Complex Societies and Urbanism in the Middle Niger and Senegal Valleys," unpublished paper.
McIntosh, S.K. and R.J. McIntosh (1993), "Cities Without Citadels: Understanding Urban Origins along the Middle Niger" in Shaw et al: 625–41.
McIntosh, Susan Keech and Hamady Bocoum (2000), "New Perspectives on Sincu Bara, A First Millennium Site in the Senegal Valley," *African Archaeological Review* vol. 17, no.1: 1–43.
Meillassoux, Claude (editor) (1971), *The Development of Indigenous Trade and Markets in West Africa* (London: Oxford University Press).

Messier, Ronald A. (1974), "The Almoravids, West African Gold, and the Gold Currency of the Mediterranean Basin," *Journal of the Economic and Social History of the Orient* vol. 17, part 1 (1974): 31–41.
Miller, James A. (2001), "Trading Through Islam: The Interconnections of Sijilamasa, Ghana, and the Almoravid Movement," *The Journal of North African Studies* vol.6, no.1: 29–57.
Monod, Th. (1948), "Sur Quelques Constructions Anciennes du Sahara Occidental," *Bulletin Trimestrial de la Société de Géographie et d'Archéologie de la Province d'Oran* vol. 71, fasc. 225: 23–52.
Monteil, Charles (1929), *Les Empires du Mali. Étude d'Histoire et de Sociologie Soudanaises* (Paris: G.-P. Maisonneuve et Larose).
Monteil, Charles (1953), "La Légende du Ouagadou et l'Origine des Soninke" in *Mélanges Ethnologiques* (Dakar: Bulletin del'Institut Francais del'Afrique Noir).
Morris, James (2004), *Butabu. Adobe Architecture of West Africa* (New York: Princeton Architectural Press).
Munson, P. (1980), "Archaeology and the Prehistoric Origins of the Ghana Empire," *The Journal of African History* vol. 21, no. 4: 457–66.
Niane, D.T. (editor) (1984), *General History of Africa IV: Africa from the Twelfth to the Sixteenth Century* (Berkeley: University of California Press).
Nicolas, Francois-J. (1958), "Le Bouracan ou Bougran, tissu Soudanais du Moyen Âge," *Anthropos* vol. 53: 265–68.
Norris, H.T. (1982), *The Berbers in Arabic Literature* (London and New York: Longman).
Ogundiran, Akinwumi (2000), "Potsherd Pavements in Ilare-Ijesa, Yorubaland: A Regional Perspective," *Nyame Akuma* no. 53: 35–41.
Ogundiran, Akinwumi (2001), "Ceramic Spheres and Regional Networks in the Yoruba-Edo Region, Nigeria, 13th–19th Centuries A.C.," *Journal of Field Archaeology* vol. 28, nos. 1 and 2: 27–43.
Ogundiran, Akinwumi (2002), *Beads, Cowries, and Cultural Translations of the Atlantic Experience in Yorubaland, 1600–1850* (Boston: African Studies Center, Boston University).
Ozanne, P.C. (1969), "A New Archaeological Survey of Ife," *Odu*, new series vol.1: 28–45.
Páez, Jerónimo (1999), "El Legado Andalusi. Route des Almoravides et des Almohades," *La Nouvelle Revue Anthropologique*: 92–98.
Pelzer, Christoph (2000), "Archaeological Excavations in Northeastern Burkino Faso and the Niger Bend in the Middle Ages: Balancing Different Kinds of Facts and Imagination" in "Abstracts from the 15th Biennial Meeting of the Society of Africanist Archaeologists, Cambridge, UK, July 12–15," *Nyame Akuma* no. 54: 54.
Pelzer, Christoph (2002), "Sedentary and Nomad Peoples in North-Eastern Burkino Faso: An Historical Archaeology of Change in the Oudalan" in "Abstracts from the 16th Biennial Meeting of the Society of Africanist Archaeologists, Tucson, Arizona, UK, May 18–22," *Nyame Akuma* no. 57: 66.

Peregrine, Peter N. (2000), "Archaeology and World-Systems Theory" in Hall: 59–68.
Perrot, C.H. et al (editors) (1981), *Le Sol, la Parole et l'Écrit* (Paris: Société Francaise d'Histoire d'Outre Mer).
Person, A. et al (1991), "La Mégalithes de la Zone Lacustre" in Raimbault and Sanogo: 473–510.
Phillips, Tom (editor) (1995), *Africa. The Art of a Continent* (Munich and New York: Prestel).
Pingree, David (1970), "The Fragments of the Works of Al-Fazāri," *Journal of Near Eastern Studies* vol. 29: 103–23.
Polet, Jean (1985), *Tegdaoust IV: Fouille d'un Quartier de Tegdaoust (Maurtanie Orientale)* (Paris: Éditions Recherche sur les Civilisations).
La Préhistoire de l'Afrique de l' Ouest. Nouvelles Données sur la Période Récente(1996) (Saint-Maur: Éditions Sépia).
Pwiti, Gilbert and Robert Soper (1996), *Aspects of African Archaeology. Papers from the 10th Congress of the PanAfrican Association for Prehistory and Related Studies* (Harare: University of Zimbabwe Publications).
Raimbault, Michel and Kléna Sanogo (1991), "Les Données de la Fouille sur la Butte de Mouyssam II (KNT 2), Campagnes de 1985 et 1986" in Raimbault and Sanogo: 301–89.
Raimbault, Michel and Kléna Sanogo (editors) (1991), *Recherches Archéologiques au Mali* (Paris: Éditions Karthala).
Rey, Pierre Phillipe (n.d.), "Al-Andalus: Scientific Heritage and European Thought," http://www.unesco.org/culture/al-andalus/html_eng/rey.shtml.
Robert, Serge (1970), "Fouilles Archéologiques sur le Site Presumé d'Awdaghost (1961–1968)," *Folia Orientalia* vol. 12: 261–78.
Robert-Chaleix, Denise (1989), *Tegdaoust V: Recherches sur Aoudaghost* (Paris: Éditions Recherche sur les Civilisations).
Robert-Chaleix, Denise (1991), "Sel, Coquillages et Jarosite: À Propos de la Saline Mediéval d'Awlil," *Journal des Africanistes* vol.61: 169–85.
Robert-Chaleix, Denise (1993), "Métallurgie du Fer dans la Moyenne Vallée du Sénégal" Les Bas Fourneaux de Silla," *Journal des Africanistes* vol. 64: 113–27.
Sanderson, Stephen K. (1995), "Expanding World Commercialization. The Link between World-Systems and Civilizations" in Sanderson: 261–72.
Sanderson, Stephen K. (editor) (1995), *Civilizations and World Systems. Studying World-Historical Change* (Walnut Creek and London: AltaMira Press): 206–27.
"Senegal. Thiéhel-Guede" (2002), *Archaeometry* vol. 44, part 3: 86.
Shaw, Thurstan et al (editors) (1993), *The Archaeology of Africa. Food, Metals, and Towns* (London and New York: Routledge).
Shinnie, P.L. (editor) (1971), *The African Iron Age* (Oxford: Clarendon Press)
Sidibé, Samuel (1991), "Reconnaissances Archéologiques aux Environs de Diré" in Raimbault and Sanogo: 190–202.
Smith, Andrew B. (1992), *Pastoralism in Africa. Origins and Development Ecology* (Athens: Ohio University Press).

The Song of Roland(1960). Translated by Dorothy L. Sayers (Harmondsworth: Peguin Books Ltd.).
Spufford, Peter (1993), *Money and Its Use in Medieval Europe* (Cambridgeand New York: Cambridge University Press).
Szumowski, G. (1957), "Fouilles au Nord du Macina et dans la Région de Ségou," *Bulletin de l'Institut Francais de l'Afrique Noir* vol. 19: 225–57.
Talbi, M. (1984), "The Spread of Civilization in the Maghreb and its Impact on Western Civilization" in Niane: 57–77.
Tamari, Tal (1991), "The Development of Caste Systems in Western Sudan," *The Journal of African History* vol. 32, no.2:221–50.
Thilmans, G. and A. Ravise (1980), *Protohistoire du Sénégal. Recherches Archéologiques*, vol.2: Sintiou-Bara et les Sites du Fleuve (Dakar: IFAN).
Thomassey, Paul and Mauny, Raymond (1951), "Campagne de Fouilles à Koumbi Saleh," *Bulletin de l' Institut Francais de l'Afrique Noir* vol. 13: 436–62.
Thomassey, P. and Mauny, R. (1956), "Campagne du Fouilles de 1950 à Koumbi Saleh (Ghana?)," *Bulletin de l' Institut Francais de l'Afrique Noir* vol. 18: 117–40.
Taylor, E.G.R. (1928), "Pactolus: River of Gold," *The Scottish Geographical Magazine* vol. 44: 129–43.
Togola, Téréba (n.d.), "Memories, Abstractions, and Conceptualization of Ecological Crisis in the Mande World," http://www.earthscape.org/r3/mcintosh/mcintosh06.html
Togola, Téréba (1996), "Iron Age Occupation in the Méma Region, Mali," *African Archaeological Review* vol. 13, no.2: 91–110.
Vallées du Niger(1993), (Paris: Editions de Réunion des Musées Nationaux).
Tymowski, Michal (1967), "Le Niger, Voie de Communication des Grands États du Soudan Occidentale jusqu'à la Fin du XVIe Siècle," *Africana Bulletin* no. 6: 73–95.
Tymowski, Michal (1971), "La Pêche à l'Époque du Moyen Age dans la Boucle du Niger," *Africana Bulletin* no. 12: 7–26.
Vanacker, C. (1979), *Tegdaoust II: Recherches sur Aoudaghost. Fouille d'un Quartier Artisanal*(Paris: Arts et Métiers Graphiques).
Vernet, Robert (1993), *Préhistorie de la Mauritanie* (Nouakchott: Centre Culturel Francais A. de Saint Exupéry).
Vernet, Robert (1996), "Un Exemple de Corrélation entre Char et Métal l'Art Rupestre Mauritanien" in *La Préhistoire*: 69–73.
Warmington, B.H. (1986), "The Semitic Migrations to Libya and North Africa" in *Libya Antiqua*: 165–71.
Wesler, Kit W. (editor) (1998), *Historical Archaeology in Nigeria* (Trenton and Asmara: Africa World Press, Inc.).
Wilkinson, David (1993a), "Spatio-Temporal Boundaries of African Civilizations Reconsidered: I," *Comparative Civilizations Review* vol.29: 52–90.
Wilkinson, David (1993b), "Civilizations, Cores, World Economies, and Oikumenes" in Frank and Gills: 221–46.
Wilkinson, David (1994), "Spatio-Temporal Boundaries of African Civilizations Reconsidered: Part II," *Comparative Civilizations Review* vol.31: 46–105.