

Adorning the Body, Asserting Status: Prestige-Goods and Social Distinction at Ancient Chadic Chiefdom of Houlouf (Northern Cameroon)

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Abstract: Copper and alloyed copper artefacts, carnelian and glass beads have been recovered in archaeological excavations since the middle of the 20th century in the Chadian plain in northern Cameroon, northeastern Nigeria and southwestern Chad Republic. The initial research projects conducted by Marcel Griaule and Jean-Paul Lebeuf resulted in the “creation” of the Sao Civilization, characterized by a relatively high level of art craftsmanship. They made impressive large pottery vessels, terracotta figurines, iron objects, and copper and alloyed copper artefacts, called “Sao Bronzes”. These artefacts were generally analysed from their supposed artistic characteristics; production techniques – the lost wax technique – were addressed but no metal production features were ever recorded in the first decades of research on northernmost Cameroon mounds. The Houlouf archaeological project conducted from 1981 to 1991 allowed for a better understanding of the production and use of the copper/alloyed copper artefacts and other prestige goods recovered from archaeological contexts. They range widely in nature, forms, and shape. There are ordinary personal adornment items – finger-rings, arm-rings, and ankle rings, necklaces, waist-beads – to very specialized cavalry – leg-guards – and archery – arm-bands -, including exceptional figurines. This contribution brings to light the context of use and socio-political implications of these prestige artefacts and outlines their meaning in the developing Central Sudan long-distance trade networks.

Keywords: Alloyed Copper, Copper, Carnelian, Glass Beads, Personal Adornment, Prestige Good, Grave Goods, Houlouf, Cameroon, Chadian Plain, Central Africa

1. Introduction

After leading the Mission Dakar-Djibouti (1931-1933) and before launching his long-term Dogon country anthropology project. Marcel Griaule [1] focused on the Chad basin and conducted fieldwork on the mound sites of the Chad plain. Fascinated by folk stories, he published “*Les Sao Legendaires*” in 1943, features a bygone civilization of giants, manufacturing large So-pots, terracotta figurines, and mastering copper and iron metallurgy. He literally created the “Sao Civilization” and initiated systematic archaeological fieldwork with his then partner Jean-Paul Lebeuf, to documents this vanished culture [2-4]. Jean-Paul Lebeuf and Annie Masson-Detourbet Lebeuf kept on with the tradition [5-9]. They conducted combined archaeological and

ethnographic research on kotokos polities [10, 11] and retired in the early 1980s.

It was shown that the term *Soo* or *Sao* was a Kanuri word used to refer to the mound-dwellers, speakers of Chadic languages and ancestors of present-day Kotoko. The expression “Sao Civilization” that gained currency during the Colonial Period and was even part elementary school history textbook was an artificial construct. Ancient Chadic polities is probably a more accurate label. The Houlouf archaeological project launched in 1981 initiated a shift from a single-site approach to a regional archaeology perspectives with the focus on the formation and evolution of a Chadic polity [12-17].

2. Adorning the Body, Asserting Status: Theoretical Perspectives

Objects are polysemic, consistently and systematically multivalent. Whatever the case, none has intrinsic “natural” value. Value, in this perspective, is the product of human cognitive ability to generate symbols and assign meaning. Objects values are therefore social currencies. However, the concept of “value” is not as simple as intuitively suggested above [18-21]. Marx suggested in his 1844 manuscripts that “it is use that determines a thing’s value and that fashion determines use” [19]. Use-value is accordingly determined by demand. Air is an essential life-supporting element, indispensable to any breathing creature; it has no price-tag, no exchange-value.

“The classical economist Adam Smith asked why water, which is essential to life, is normally very cheap while inessential diamonds are very expensive. The resolution depended on distinguishing between value in exchange and value in use. While the total contribution to economic welfare of water, or its use value, is very high, it is so abundant relative to other, perhaps less essential resources, that it exchanges in markets for only small quantities of the other resources.” [21].

Things with higher utility like air and water tend to have the lowest value and those with low utility like diamond, gold, jewellery, etc.. tend to have higher value. Use value and exchange value are incommensurable but they are nonetheless “inseparable dialectical aspects of the social unit the commodity” [19]. Things or objects, subsumed under the category of material culture, crafted and used by humans, can be differentiated by raw materials, labour invested in their procurement and transformation, their distribution and use.

There is an unstable system of use and display of material culture. It is a process in which material capital is translated into higher valued symbolic capital [22]. Exotic and scarce materials as well as personal adornments objects tend to be relied upon to display and assert social statuses [23, 24]. A ruler is symbolized by a crown, a warrior by a sword. The working of such a dynamic system thus requires either local procurement of critical raw materials and/or access via long distance exchange networks, skilled labour to process the raw material and manufacture prestige-goods items, and finally, their distribution, acquisition, use, display, and final disposal, in this case in burial contexts. This paper examines how copper and alloyed copper objects were used in social distinction strategies set in place by the elite members of the Houlouf, an ancient Chadic Polity in the Northern Cameroon portion of the Chadian plain between 1000 and 1800 CE. [Common Era].

3. Methodology

3.1. The Houlouf Archaeological Project

The Houlouf Archaeological project was initiated in 1980. Archaeological fieldwork organized in 10 field seasons was

conducted from 1981 to 1991. Data processing, laboratory analyses and writing too some ten years to be completed, with the complete monograph published in 2002 [15]. The delineated study area, situated at 11°40' – 12°10' latitude North and 14°50' -15°15' longitude East, measures 500 square kilometers (figure 1), delimited in the east by the meandering course of the Logone River. The area situated in northern most Cameroon is located in the Chadian plain. It is a low-lying landscape with arbustive savanna and grassland in the annually flooded depressions. 20 archaeological sites of varying size and shape were mapped and 14 excavated. The recorded occupation sequence of the Houlouf region that started around 1900 BCE (Before Common Era) following the receding of Lake Chad is approximately 4000 years long. It is divided into 5 main phases with varying number of sites in each.

The initial Deguesse phase (ca. 1900 BCE – 0 CE (Common Era)) is comprised of two sites, Deguesse and Krenak, both mobile pastoral groups occupations on the receding Lake Chad islands. It is followed by the Krenak phase (0 – 500 CE) that witnessed the formation of sedentary village communities. It is made of four equidistant settlements, Ble, Deguesse, Houlouf and Krenak, located along the lake’s shore in a deltaic contexts. The number of established settlements shifted from 4 to 8 during the Mishiskwa phase (500 – 1000 CE), with the addition of Hamei, Krenak-Sao, Madaf and Mishiskwa. Settlement growth is sustained during the Ble Phase (1000 – 1400 CE) with this time 10 sites arranged into two competing peer-polities: the Houlouf one in the northwest with Deguesse, Hamei, Madaf and Houlouf, the Ble-5 - Mounds complex in the southeast, and Mishiskwa as an outlier. During the Houlouf phase (1400-1800 CE) that witnessed a dry spell, the number of sites dropped to 7, with a significant shift westward. Houlouf became the main center of the dominant polity, with a virtual monopoly on exotic prestige goods, including alloyed copper artefacts, carnelian and glass beads [12-17].

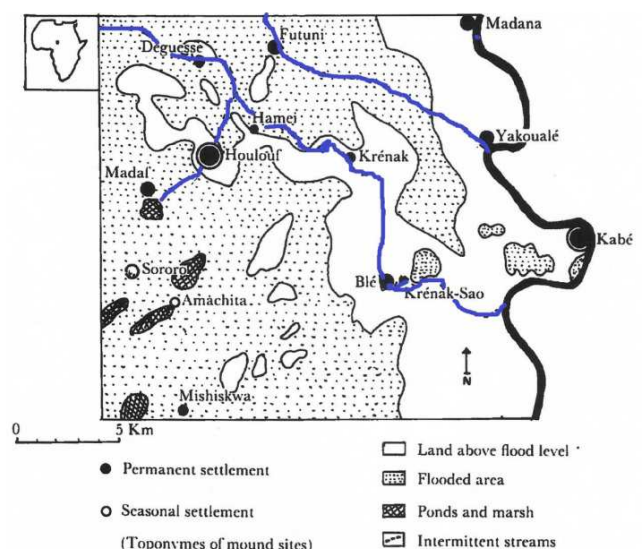


Figure 1. Archaeological sites from the Houlouf Region.

3.2. The Archaeological Record: Houlof Copper/Alloyed Copper Artefacts

One hundred copper/alloyed copper artefacts were excavated from the earthen-walled central site of Houlof. The earliest specimens, dated to 500 CE at the beginning of Mishiskwa phase and collected in Houlof occupation II at 3.20-3.40 m below the surface, consist of 4 buttons, likely part of an unpreserved garment. The discovery of a crucible at Mishiskwa along with evidence of copper slag fragments recorded in the Houlof archaeological sequence, at 1.60-1.80 m dated to 1165-1190 CE and 0.30-0.60 m dated to 1500-1600 CE, point to the local production of at least some of the alloyed

copper objects. Two techniques were generally in use. The lost-wax technique was used for the production of dense artefacts such as arm-rings, rings, torque and spurs. Hot and cold hammering combined with welding and bending was used for the manufacture of leg-guards and arm-bands

Most of the recorded copper/alloyed copper artefacts were collected from burials. They were used for personal adornment, and prestige items signalling achieved social status. The Items of personal adornment are distributed into four categories: arm-rings, rings, torque, and buttons and garment-tokens. Status objects, all related to war and horsemanship, include leg-guards, arm-bands, and spurs.

Table 1. Distribution of copper/alloyed copper items of personal adornment.

Context	Personal adornment			War and horsemanship			Total
	Arm-ring	Ring	Other	Leg-guard	Arm-band	Spur	
Houlouf Phase (1400 – 1800 CE), cemetery							
Burial 11	4	3	2	2	1	-	12
Burial 12	2	1	-	-	-	2	5
Burial 13	7	-	-	2	-	-	9
Burial 16	1	2	-	-	-	-	3
Burial 17	-	-	-	-	-	2	2
Burial 20	-	-	-	-	1	-	1
Burial 21	1	1	-	-	-	2	4
Burial 26	-	1	-	-	-	-	1
Burial 27	-	-	-	2	-	-	2
Burial 30	3	4	-	-	-	-	7
Burial 31	-	1	-	-	-	-	1
Burial 32	4	2	-	-	-	-	6
Burial 34	-	1	-	2	-	-	3
Burial 36	1	3	-	-	-	-	4
Burial 43	1	-	-	-	-	-	1
Burial 50	7	-	-	2	-	-	9
Total	30	20	2	10	2	6	70
Ble Phase (1000 -1400 CE)							
Square C3	2	-	-	-	-	-	2
Burial 58	1	-	1	-	-	-	2
Burial 60	-	2	-	-	-	-	2
Burial 68	-	-	-	2	-	-	2
Burial 70	1	-	-	-	-	-	1
Burial 74	1	-	-	-	-	-	1
Burial 75 13	-	-	-		2	15	
Burial 78	1	-	-	-	-	-	1
Burial 81	1	-	-	2	-	-	3
Burial 83	1	-	-	-	-	-	1
Total	21	2	1	4	-	2	30
Mishiskwa phase (500 – 1000 CE)							
Courtyard	-	-	4	-	-	-	4
Burial 80	-	1	-	-	-	-	1
Total	-	1	4	-	-	5	

3.3. Structures and Patterning of the Recorded Material Culture

The sample of copper/alloyed copper artifacts collected from the Central site of Houlouf amounts to 105 specimens (Table 1). 5 specimens were collected from the Mishiskwa phase (ca. 500 – 1000 CE) deposit, shifted to 30 in Ble phase (1000-1400 CE) levels, and finally peaked at 70 in the Houlouf phase (1400 – 1800 CE).



Figure 2. Carnelian beads and associated copper artefacts from Ble Phase (1000-1400 CE) female and male burials.



Figure 3. Ble Phase (1000-1400 CE) horse-ridder burial and a horse-ridder copper figurine.

Ble phase Copper/alloyed copper artifacts were collected from 9 burials but their distribution is strongly skewed in favor of burials 75 and 81 which contained 18 items out of 30. Burials. Spurs are clearly use for the handling of horses and leg-guards protect the legs and ankles of horse-ridders against enemies swords in cavalry engagements. Accordingly, the items of horsemanship point to the emergence and existence of a corps of elite warriors at the Houlouf earthen-walled city during the Ble phase (figure 3).

Social differentiation and trends toward stronger social ranking were amplified during the Houlouf phase (1400-1800 CE). Houlouf, protected by a strong earthen rampart became the un-rivalled primate center of the polity of the same name. It witnessed the installation of a restricted access

elite cemetery (figures 4 and 5), indicated by a dense cluster of large vessels used as grave-markers, arranged around a central monument (figure 5), with tightly regulated burial protocol (figure 7).

The highly choreographed mortuary program mobilized a relatively large number of copper/alloyed copper artefacts, carnelian beads and other exotic raw materials. The cemetery is divided in four burial-clusters [12-15] with 4 to 8 burials each, arranged around the central effigy-jar. A detailed analysis of the main aspects of the Houlouf phase cemetery will allow for a better grasp of the social use of copper/alloyed copper artefacts and other exotic goods.

4. Results

4.1. The Houlouf Phase Cemetery (1500-1600 CE)

The Houlouf phase cemetery, dated to 1500-1600 CE, is relatively densely packed with 25 burials in less than 40 square meters in the north half of the Houlouf excavation probe (figure 6). The graves are indicated by 1 to 3 super-imposed large clay vessels (figure 4), without contact with the skeletons, explicitly used as “burial-markers”. All the deceased are buried in sitting position, facing southwest as the effigy-jar central monument (figure 5), with feet in a large pot (figure 7). The Cemetery is organized in four burial-clusters located in the SE, SW, NE and NW (figure 8).



Figure 4. Partial view of Houlouf phase elite cemetery.



Figure 5. The Effigy-Jar central monument of Houlouf elite cemetery, facing southwest.

The SE cluster includes 8 burials. The burial facilities are made of 1 to 3 large vessels grave-markers and 1 to 2 pots for feet with one exception (burial 20). Burial inclusions, *de facto* grave-goods consist of 1 to 12 copper/alloyed copper artefacts per burial with one exception (Burial 22) (table 2), 5 to 174 carnelian beads, 1 to 3 coarse stone artefacts, and finally, 2 cases of terracotta figurines (table 2).

The SW cluster is made of 7 burials, with 1 to 2 large vessels tomb-markers and 1 – 3 Pots. 1 to 3 copper/alloyed copper artefacts were recorded from 4 burials, 1 to 58 carnelian beads, 1 glass bead, 2 cases of terracotta figurines, as well as 1 to 3 coarse stone artefacts (table 2).

There are six burials in the NW cluster, with single large vessel tomb-marker and 1 pot for feet in 4 occurrences. 1 to 7 copper/alloyed copper artefacts were collected from 4 burials, along with 3 to 42 carnelian beads, 1 terracotta figurine, and 3 coarse stone artefacts (table 2).

Finally, the NE cluster, the smallest, consists of 4 burials, each with one large vessel grave-marker and 1 feet-pot. 3 to 7 copper/alloyed copper artefacts as well as 8 to 134 carnelian

beads, and 1 to 2 coarse stone artefacts have been recorded in 2 of the burials (table 2).

The differential distribution of grave-goods points to the existence of outstanding individuals cumulating distinct symbols of power and prestige. Beside personal adornment artefacts represented by copper arm-rings and rings, carnelian, glass, and clay beads (table 2), some peculiar objects such as arm-bands, leg-guards, and spurs point to prestigious warriors and horsemen status. Arm-bands found in Burial 11 and 20 are used to protect the wrist from the return vibration of the bow string. The are accordingly archers' equipment. They are particularly cumbersome, weighing 0.650 and 0.750 kg, made of two bent and welded copper/alloyed copper sheets. Leg-guards, also made with bent copper/alloyed copper sheets were used to protect horse-riders legs and ankles from enemys' sword hits. They are found in 5 burials (Burial 11, 13, 27, 34, and 50) and weigh 0.640 to 0.310 kg. And finally spurs, designed for horse-riding, are found in burial 12, 17, and 21.

Table 2. Distribution of burial facilities and grave-goods.

Feature	Tomb	Feet	Copper	Carnelian	Clay	Coarse
Number	marker	pot	artefacts	beads	beads	stone
SE cluster						
Burial 11	3	1	12	115	-	-
Burial 12	3	1	5	42	-	-
Burial 13	2	1	9	174	1	-
Burial 20	1	-	1	11	-	3
Burial 21	1	1	4	136	-	1
Burial 22	1	1	-	7	1	3
Burial 43	2	2	1	5	-	1
Burial 50	1	1	9	126	-	-
Total	14	8	41	616	2	8
SW cluster						
Burial 14	2	-	-	4	-	1
Burial	16	2	3	3	3	-
Burial 17	2	1	2	58	1	3
Burial 18	2	1	-	18	-	-
Burial 26	1	1	1	15	1	-
Burial 27	1	1	2	10	-	2
Burial 56	1	1	-	1	-	-
Total	11	8	8	106	2	6
NW cluster						
Burial 29	1	-	-	-	-	1
Burial 30	1	1	7	5	-	1
Burial 31	1	1	1	-	-	-
Burial 35	1	1	-	3	-	1
Burial 36	1	1	4	42	1	-
Burial 37	1	-	-	-	-	-
Total	6	4	12	50	1	3
NE cluster						
Burial 23	1	1	-	-	-	1
Burial 24	1	1	-	-	-	-
Burial 32	1	1	7	134	-	-
Burial 34	1	1	3	8	-	2
Total	4	4	10	142	-	2

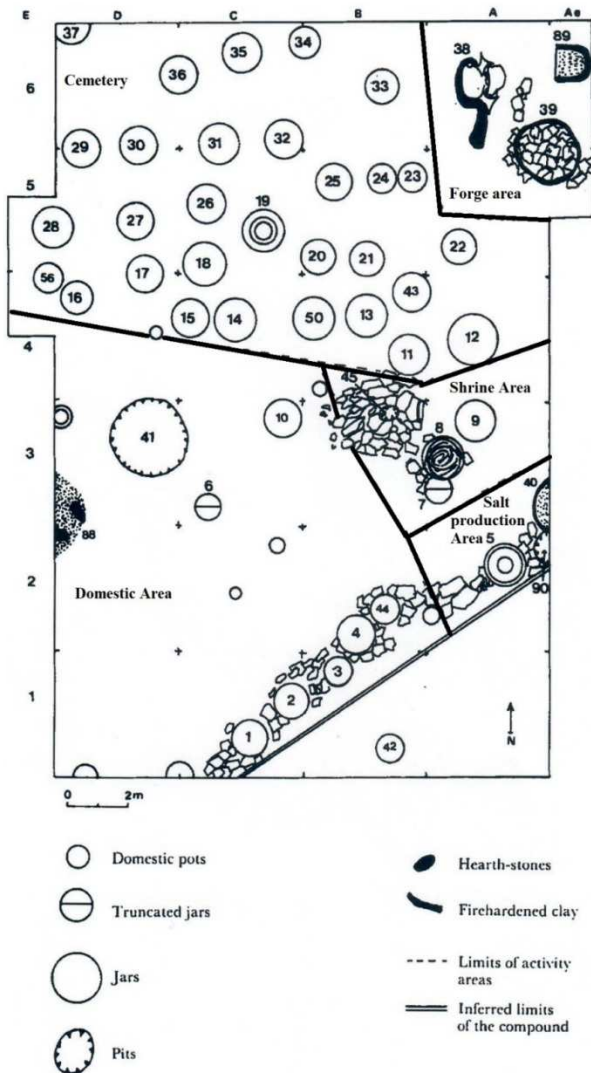


Figure 6. Houlouf Phase level VII with a restricted access cemetery in the northern half.



Figure 7. The deceased are buried in sitting position, facing southwest, with feet in a large pot.

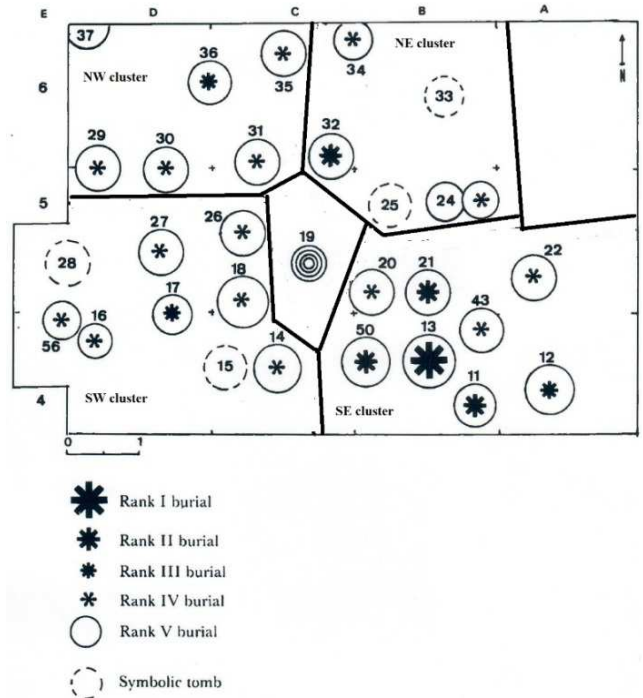


Figure 8. Organization of the Houlouf phase cemetery with burials ranking.

High-ranking individuals, from Rank I and II are found in 2 of the 4 identified clusters, with the highest concentration in the SE cluster (figure 8). The latter includes Burial 13, the top-ranked individual with 174 carnelian beads, 2 leg-guards, and 7 arm-rings; Rank II Burial 11, 21, and 50, with respectively 115 carnelian beads, 4 arm-rings, 2 rings, 2 leg-guards, 1 arm-band, and 2 copper/alloyed copper garment tokens for the first, 136 carnelian beads, 1 arm-ring, 1 ring, and 1 coarse rock for the second; and finally, 126 carnelian beads, 7 arm-rings, and 2 leg-guards for the third.

In contrast to the distribution of carnelian beads, the distribution of copper/alloyed copper artefacts is limited to 16 burials out of 29. They are predominantly made of personal adornment items, 32 arm-rings, 18 rings, and 2 garments tokens found in 14 burials. The Warriors and horse-riders status symbols are restricted to 9 individuals: Rank I individual 13, Rank II individuals 11, 21, 32, and 50, Rank III individuals 12 and 17, and finally Rank IV individuals 20, 27, and 34.

4.2. Metallographic Analyses

Eighteen copper/alloyed copper artefacts from the Houlouf phase deposit were submitted to advanced metallographic analyses (table 3). All the analyzed specimens are basically ternary to quaternary alloys with copper (Cu) proportions ranging a maximum of 89.45% in an arm-band from burial 11 to a minimum of 61.20% in an arm-ring from burial 32 (Table 3). With very few exceptions, each artefact presents a unique combination of metal components, suggesting that each order was unique, the melted metal obtained from ingots or worn out objects from different origins.

Burial 11 arm-band has the highest proportion of copper

(Cu), with the other 3 key components ranging from 4.50% for tin (Sn), 2.65% for lead (Pb) and 2.00% for zinc (Zn). Burial 20 specimen has higher proportion of lead, 7.20% (Pb) and zinc, 8.00% (Zn).

Table 3. Metallographic composition of Houlof phase copper/alloyed copper artefacts.

Context	Cu	Sn	Pb	As	Sb	Ag	Ni	Bi	Fe	Zn	Mn
Arm-bands											
Burial 11	89.45	4.50	2.65	0.60	0.50	0.08	0.20	0.025	0.001	2.00	-
Burial 20	75.95	2.00	7.20	1.20	0.60	0.08	0.04	0.01	2.00	8.00	-
Leg-guards											
Burial 12	78.10	6.85	8.15	0.40	0.60	0.15	0.15	0.02	0.10	5.50	-
Burial 13	79.55	4.20	6.40	0.10	0.30	0.06	0.03	0.007	0.50	8.80	-
Burial 13	78.50	6.55	7.80	0.30	0.40	0.07	0.10	0.03	0.20	6.00	-
Burial 16	78.90	3.00	5.60	2.00	1.20	0.20	0.05	0.015	2.00	7.00	-
Burial 50	72.50	6.80	14.50	0.25	0.25	0.10	0.05	0.005	0.05	5.50	tr
Burial 50	74.75	1.90	14.05	1.00	1.20	0.10	0.40	0.015	0.10	6.50	-
Arm-rings											
Burial 32	73.00	2.80	4.10	1.50	1.00	0.30	0.08	0.03	1.50	10.00	tr
Burial 32	61.20	0.50	12.80	0.06	0.05	0.04	0.01	tr	0.15	25.00	tr
Burial 32	74.80	3.80	10.80	0.25	0.15	0.05	0.02	0.003	0.10	10.00	tr
Burial 32	88.00	7.00	2.00	0.20	0.40	0.08	0.008	0.002	0.25	2.00	0.005
Burial 50	79.75	2.90	9.50	0.60	0.50	0.06	0.25	0.025	0.20	6.20	-
Rings											
Burial 21	79.40	7.30	1.25	0.50	0.80	0.15	0.05	0.02	0.25	10.00	tr
Burial 31	61.20	4.40	13.20	0.25	0.25	0.06	0.15	0.008	0.40	20.00	tr
Burial 36	87.50	1.00	4.20	0.80	0.20	0.08	0.025	0.005	1.00	5.00	0.003
Burial 36	85.50	1.00	1.50	0.60	0.35	0.05	0.02	0.005	0.80	10.00	0.003
Spurs											
Burial 17	73.40	0.50	4.50	2.00	0.30	0.08	0.03	0.002	4.00	15.00	0.003

Key: Cu = copper; Sn = tin; Pb = lead; As = arsenic; Sb = antimony; Ag = silver; Ni = nickel; Bi = bismuth; Fe = iron; Zn = zinc; Mn = manganese

The leg-guards can be split into two groups. One made of 4 specimens from Burial 12, 13 and 16 have Cu proportions ranging from 79.55 to 78.10%, Sn from 3.00 to 6.85%, Pb from 5.60 to 8.15% and finally, Zn from 5.50 to 8.80% (table 3). The other with two leg-guards from Burial 50 have lower Cu proportions, respectively 72.50 and 74.75%, 1.90 to 6.80% Sn, 14.05 to 14.50% Pb and 5.50 to 6.50% Zn. Each of the arm-rings presents a unique combination of metal components. Cu proportions range from 61.20 to 88.00%, Sn from 0.50 to 7.00%, Pb from 2.00 to 12.80%, and finally, Zn from 2.00 to 25.00%. The situation is identical for the recorded rings, belonging to burial 21 and 36. The set from burial 21 has 61.20 to 79.40% Cu, 4.40 to 7.30% Sn, 1.25 to 13.20% Pb, and 10.00 to 20.00% Zn. Burial 36 specimens have 85.50 to 87.50% Cu, 1.00% Sn, 1.50 to 4.20% Pb and Finally, 5.00 to 10.00 Zn. And the single specimen of spur has 73.40% Cu, 15.00% Zn 4.50% Pb and 0.50% Sn.

Copper and alloyed copper raw material, along with other exotic objects like carnelian and glass beads, were accessed through long-distance trade networks that connected different parts of the continent in the last two millennia.

4.3. Long Distance Trade Connections and Exchange Dynamics

Provenience studies of African archaeological material culture are still very limited [25-27]. No significant research has been carried on the sources of a large spectrum of raw materials that was traded through African past long-distance exchange networks [23]. Sutton (1991 [29]) revived Arkell's [30] idea of Cambay (India) as the source of carnelian beads found in Africa. According to him, carnelian beads produced

at Cambay in India were shipped through Red Sea harbours, to Egypt and from there transited through the Nile valley, Nubia and the Chad basin to reach Igbo Ukwu region in southeastern Nigeria [31, 32] in the 10th Century CE. Sutton [29] acknowledges that his suggestion is highly speculative and untestable. The scanty archaeological work conducted in the eastern part of the Chad basin [33] and Central Darfur further east [34] does not provide additional evidence and supporting data.

Evidence attesting for the production of carnelian beads have been recorded in Mali, at a few thousands kilometers west of the Chad basin. These workshops are located in the Tilemsi valley, from the Adrar-n-Ifoghas in the north to the Niger river bend in the South [35]. A calcedony outcrop named as "La station de la calcédoine" was found at about 50 kilometers north of Kidal in the Adrar-n-Ifoghas. The site measures approximately 1 hectare in surface extent.

"Presque toutes les variétés (de calcédoines) sont présentes: agate, onyx, chrysoprase, jaspe, cornaline, toutes roches vivement colorées et tellement brillantes que les deux Sonray qui nous accompagnaient se mirent à pousser des cris de joie, persuadés que nous venions de découvrir une mine de pierres précieuses. Toute l'industrie est lisse, brillante comme vernie, et il apparaît que la technique de chauffe préalable à la taille ait été systématiquement utilisée» [35].

[Almost all kinds of calcedony are represented: agate, onyx, chrysoprase, jasper, carnelian, all very colourful and shining rocks, so that both Sonray guides screamed of excitement, convinced that that have just discovered a mine of precious stones. All the manufactures artefacts are smooth and shining as if varnished. It appears that heating prior to

shaping was systematically used” [35]

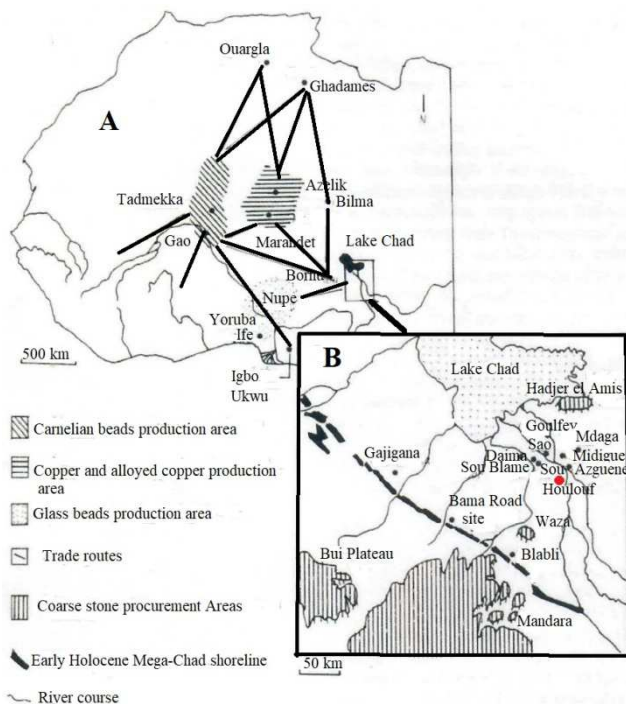


Figure 9. Map of some West African long-distance exchange network during the last 2 millennia.

Many other workshops were recorded at Asselar, Eblebit, Smar Smarren, Nilkit Mich II, Ilouk, Gadaoui, Lagreich Neo I, In Arabou, Aoukert and Gao-Hydrocarbure on the shore of the river Niger. The highest concentration of complete carnelian beads was recorded at the latest site. It is in the latter site. At each of the recorded workshop, the concentration of carnelian beads production waste is very high, suggesting a specialized craft provisioning groups far above the needs of the involved domestic units. Surface sites are difficult to date without careful excavations. However, carnelian beads were found in burial mounds of the Inland Niger Delta dated to 700 -1100 CE [36, 37] and in other archaeological sites such as Goa-hydrocarbures [37], Igbo Ukwu [31, 32], in In Gall Tegidda-n-Tesemt burial mounds [38], and at Tin Nak I in Telataye region in the Tilemsi valley [35].

The location of carnelian beads production workshops, set between Tadmekka and Ghadames (figure 9A), as well as their relatively high value in contemporary societies are described by Al Bakri who lived in Al Andalus in 1100 -1200 CE as follows:

“Another road from Tadmekka to Ghadamis: you go from Tadmekka for six days over the country inhabited by the Saghmara and then through the waterless waste for four days before attaining water, and then through another waterless région also four days. In this second waste is a mine of stone called tasi-n-nasamt, which resembles agate (aqiq). Occasionally you may find in one stone various colors such as red, yellow, or white. Sometimes, though very rarely, a large, fine stone is found. When such a stone is brought to the

people of Ghana, they value it extravagantly and pay a high price for it. They consider it to be more splendid than any other precious object. This stone is polished and pierced by means of another stone called ti-n-tuwas in the same way as rubies are polished and pierced with emery. Iron would make no impression on it at all without the ti-n-tuwas. The place where this stone lies can only be located precisely by slaughtering a camel and sprinkling its blood over the mine. The stones thus appear and may be picked up.» [40]

Carnelian beads were accordingly manufactured in the Tilemsi valley and the Adrar-n-Ifoghas from the first millennium CE on. They were involved in the cycles of exchange Saharan pastoralists, berbers and Tuareg, and sedentary populations from the Niger river. Goods were dispatched either through the Niger river traffic or on land through caravans. The Niger river systems operated with dug-out flotillas that could reach, as far as Igbo Ukwu region in southeastern Nigeria. Merchants caravans, sponsored by Arab, Berber, Tuareg, Hawsa, Diulas, Kanuri, etc. connected the rest of West Africa to North Africa, the In Gall Tegidda-n-Tesemt to the Hawsa city-states and the Bornu kingdom, reaching the mound sites from the Chad basin (figure 9A and B). Accelerated social differentiation had boosted the demand for scarce and exotic materials and prestige goods and facilitated the deployment of long-distance trade networks

As was the case for carnelian beads, copper and alloyed copper, as ingots or artefacts, were parts of the goods exchanged in the long-distance trade networks that criss-crossed Central and West Africa. There are abundant evidence for the smelting and production of copper artefacts in the mound sites from the Chad plain [23, 7, 9, 12, 13, 15]). There are two possible sources of the copper and alloyed copper found in the mound sites of the Chad plain. One is the Bauchi plateau in Nigeria, a few hundred kilometers southwest of the Chad plain and the other is the In Gall Tegidda-n-Tesemt region in Niger, also a few hundred kilometers away but in the Northwest (figure 9).

Data on Bauchi plateau copper metallurgy are ambiguous and uncertain. The exploitation of tin is however well documented. There is better documentation on the In Gall Tegidda-n-Tesemt region metallurgy with the important production centers of Azelik, Marandet, and other smaller stations dated between 500 and 1800 CE [41, 42]. Archaeological research points to particularly intensive copper production at Marandet between 800 and 1000 CE and Azelik and surrounding lands from 1100 to 1600 CE. Ibn Battuta provide some information on the circulation of copper and copper objects made at Takadda (Azelik) in 1355:

“... the copper is transported from here to the city of Kùbar in the land of the Infidels and to Zaghay and the land of Burnii, which is at a distance of forty days from Takadda... From this country they bring handsome slave girls ijawari) and young men slaves (fityan) and cloth dyed with saffron (Jasad)” [40].

Copper from Azelik was shipped in different directions, including the kingdom of Bornu [Burnii] where it was

exchanged for young male and female slaves and famous dyed tuniques [tobbes] made by ancestral kotoko inhabiting the Chadian plain mound sites. Kotoko merchants caravans connected Bornu markets places to different cities of the Chadian plain. The raw material and manufactured objects obtained by those who could afford them were forwarded to blacksmiths workshops to be made into arm-band, leg-guard, spur, arm-ring, ring, or garments tokens to be used in daily life activities.

5. Conclusion

Copper and alloyed copper raw material and artefacts were parts of high-value prestige items that played important roles in the emergence and development of ancient African long-distance trade networks. These commodities were used by local elites to assert and display their social statuses. The earthen-walled 15.5 ha center of Houlouf achieved regional primacy in 1400 – 1800 CE Houlouf phase, and monopolized access to exotic prestige goods. Relying on raw material obtained very likely from neighbouring Bornu kingdom markets, local elites commissioned a diversified range of copper/alloyed copper objects from local blacksmiths workshops. These insignia, part of the elite members social persona and glued to their statuses ended up in their final resting places, in their burials.

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