

THE MANDARA ARCHAEOLOGICAL PROJECT :
PRELIMINARY RESULTS OF THE 1984 SEASON

Nicholas DAVID, A. Scott MacEACHERN
University of Calgary

INTRODUCTION

This paper is a very preliminary report on the first stage of

- a) an investigation of the culture history of the diverse peoples of the northern Mandara mountains and adjacent plains of North Cameroon, and
- b) an associated enquiry into the nature and uses of style in material culture as a form of communication.

Our choice of area was affected by both practical and theoretical considerations. We will not dwell on the former, although these include both the size of the Canadian team, six archaeologists and one geoarchaeologist, Michael WILSON (this volume), and the length of our field season, from mid-May to the end of July, 1984. For academic reasons we required a region possessing a maximum of, on the one hand, topographic and environmental variety, and, on the other, ethnic and socio-economic complexity. The 2000 sq km area selected for

intensive investigation in the northern Mandara possesses both, with environments ranging from the plain of former Lake Mega-Chad at about 320 m a.s.l. to the plateau around Mokolo that averages 700-800 m (Fig. 1). It also includes all or part of the territories of at least 16 ethnic groups. With the exception of the Choa dialect of Arabic, these are all speakers of Chadic languages (Table 1), varying from small communities of subsistence framers to the inheritors of the precolonial Wandala (Mandara) state.

Our aims are threefold. First, and as a necessary introduction to the study of style, we wish to establish the broad outlines of the terminal Pleistocene and Holocene prehistory of the region. We hope to gain an understanding of prehistoric subsistence-settlement systems that will ultimately enable us to explain the region's ethnic diversity and to infer the dynamics of its culture history.

Understanding of developments in our region is of course in part dependent upon being able to compare its prehistoric record with that of neighbouring areas : with Borno to the northwest and the sequence constructed by CONNAH (1981, 1984); the "Sao" area of Cameroon and Chad to the north (A. HOLL, this volume ; LEBEUF 1962, 1969 ; LEBEUF *et al.* 1980) ; the Diamare to the east where A. MARLIAC (1973, 1975, 1981, 1982, 1985 ; MARLIAC and DELNEUF 1984) has been conducting research for many years, and with that of the Upper Benue Basin Archaeological Project (DAVID 1981) and of Michèle DELNEUF and colleagues to the south.

Our second aim is theoretical. Archaeologists are constantly digging up remains - for example fragments of pots or hoes - that embody both functional and stylistic information. In various ways we are becoming better at identifying function and at inferring the economic infrastructure of prehistoric societies. However, in order to carry out a particular task, there are generally a large number of different but functionally equivalent, equally efficient, forms of artefact. The choice among them is in fact a choice of a particular stylis-

tic expression and, following SACKETT (1982), we define style as "an aspect of form that is either adjunct to utilitarian function or which represents a choice, conscious or capable of being raised to the level of consciousness, between equally viable functional alternatives". The stylistic component of artefacts is the main expression of the structure and superstructure of past societies that is available for and amenable to archaeological analysis. It is therefore surprising that, until very recently, archaeological theories of style were simple in the extreme and often reducible to the belief that stylistic similarity between assemblages is a simple function of social interaction between the social groups responsible for their production. Our second, long term aim is therefore to work in the light of recent theoretical approaches (e.g. WOBST 1977 ; HODDER 1982) towards a theory of style that will be of general predictive value in archaeology, and that can be applied to enrich our understanding of the culture history of the northern Mandara region.

Thirdly, we aim to assist our colleagues at the University of Yaoundé, the Institut des Sciences Humaines and ORSTOM in the formation of Cameroonian archaeologists. Already in 1984, we were joined for part of the season by two recent graduates of the University of Yaoundé, MM. Martin POULIBE and Thomas NGOUNE. Our collaboration proved successful and mutually beneficial.

THE 1984 SURVEY

SURVEYS

Since our chosen area had not previously been the subject of systematic archaeological research, and in order to familiarize ourselves with the area and its peoples for later ethnoarchaeological studies, our first task was to survey the region for archaeological sites. Two kinds of surveys were carried out, probability and judgmental. These were then followed

by test excavations of one Neolithic and one Iron Age site.

a) The probabilistic survey

Following the classification of each of the 2000 one kilometre squares in the research area by topography, ethnicity (and other variables) (Table 2a), we selected a stratified random sample of 39 squares (Table 2b), the proportion of each stratum chosen reflecting to some extent our intuitions regarding the likely density of sites within them. In the event we were only able to survey 33 of the 39 squares (Fig. 1).

The probability sample produced 42 collections of flaked and ground stone, pottery, iron and iron slag, and other less common materials including beads and glass. Many of the collections made (during both types of survey) are from surface scatters on coherent archaeological sites, and are thus likely to represent single occupations, most of the remainder being general collections from squares that may well include materials of very different ages. We did not attempt exhaustively to cover every metre within each square ; rather we extensively sampled each microenvironment represented, again focusing on those that in our opinion were most likely to have preserved *in situ* materials. We soon learnt, for example, that the practice of terracing results in the rapid destruction of sites, and that to find even subrecent sites on the plateau and in the hills it will be necessary first to identify internal drainage basins in which sedimentation has taken place. These must then be prospected for cut sections and pits in which archaeological materials may be visible. In short, the probability survey required us visit all parts of the region and taught us a great deal about the geomorphological and anthropic processes that have affected and which continue to affect the region's archaeological potential (WILSON this volume).

b) The judgmental sample

While following one's intuitions - reconnaissance au

pifomètre - is often an effective way of discovering archaeological sites, it has the disadvantages as compared with probability sampling that one cannot subsequently make predictions about site numbers, types or distributions from the sample obtained with a known degree of uncertainty, and that the surveyor's biases may lead to the omission or gross over-representation of certain classes of sites.

Our judgmental survey concentrated on areas that were either in close proximity to the probability squares and could therefore be surveyed on the same day, or were of known historic significance, or were of especial geomorphological importance. A partial listing follows.

- the Ngassawé flood plain and right bank terrace from the Mora-Kerawa road downstream to Sare (one Neolithic and one Iron Age site discovered),
- Doulo, a former Wandala capital (several IA collections, probably all historic or sub-recent),
- excavations by road-builders on either side of the Mora-Kousseri road from ca 4 km south to ca 10 km north of the Bama-Limani-Yagoua ridge, an ancient shore line of Lake Mega-Chad (several traces of Neolithic occupations north of the ridge),
- older red dunes between Mémé and Kossa that predate the Bama ridge (archaeologically sterile),
- part of the Ouldémé valley (only recent sites found, and evidence of smelting in the hills to the south),
- Vama-Mbrema territory in the hills south of Mora (evidence of iron smelting and Iron Age middens reported to us by O. NYSSENS),
- the crater of Mt Gouaza (several promising locations but no definite sites),
- the plains north and west of Mt Gréa (two Iron Age mounds discovered and an historic site visited), and
- an area around Mehé Djiddere (site 523), was later tested).

Both the Gréa and Mehé localities are just outside the research area initially defined (Fig. 1).

The types of site recognized during the survey include :

- remains of villages abandoned relatively recently,
- iron smelting furnaces of the historic period,
- surface scatters formed by a variety of erosive and depositional processes and representing both Neolithic and Iron Age occupations,
- much rarer finds of Iron Age but not unfortunately earlier occupations in cutbanks and well sections,
- Iron age mounds and mound complexes,
- a Neolithic quarry site (529B ; UTM 1210.4/379.8) near Mozogo comparable to but smaller than the famous Maroua sites studied by HERVIEU (1968),
- an extensive Neolithic camp (site 506), just north of the Bama ridge, which we also tested, and
- scattered and isolated flaked stone tools that can grossly be assigned to the Middle and Late Stone Ages.

A total of 36 collections were made during this part of the survey, and it was by this method that we discovered the mound sites that offered the best prospects for deriving Iron Age cultural chronology. One disappointment, however, was our failure to locate any caves or rock shelters or other sites that might be expected to contain long sequences of earlier occupations. Caves and rock shelters suitable as habitation sites may indeed not exist in our area due to the nature of faulting and weathering of its mainly granitic rocks, (WILSON, this volume).

c) Analysis of the collections

Preliminary description of the sherd collections in terms of a wide range of technological, morphological and decorative attributes was carried out during the field season, standardization being maintained by reference to a "sherd library" containing examples of all the attribute states represented. Nicholas JONES (n.d. a), with the assistance of Martin POULIBE, also carried out in Mora a limited study of modern pottery made by Kirdi Mora, Matakam, Kanuri and other potters

in order to record in a preliminary fashion some of the correlations between attributes that presently characterize ethnic groups. He was able to show that, although most of the pots studied had been made for the Mora, and thus a mainly Wandala, market, there are clear differences in overall vessel and rim morphology and in decoration between the various pottery suites (Figs 2-4 and Table 3).

This experience was of value in interpreting the sherds in the archaeological series and in helping to orient JONES's (n.d. b) working up of data recorded in the field on the pottery collected during the surveys. JONES formalized an attribute system to describe the variation present, and subjected the almost entirely Iron Age samples from the probability survey to several analyses using WARD's 6 hierarchical method in the CLUSTAN package. While imperfect and provisional, the results he obtained using a combination of decoration/surface treatment and morphology attributes revealed high order clusterings (A-D) in the data that show a fair degree of spatial correlation with the main regional ethnic groupings (Fig. 5 ; see also Table and Fig. 6). Lower order clusters (1-8) do not segregate spatially, possibly because they reflect change within a region through time. This has not yet been further investigated. For the moment, however, it would seem that, although likely to be strongly biased towards recent and sub-recent times, our samples are likely to span a considerable time depth, and, if so, that there is substantially more cultural stability in the area than is suggested by most historical sources and oral traditions (summarized by BOULET *et al.* 1984).

Turning to the question of inter-regional relationships, our Neolithic materials show close parallels to those of Borno (see discussion of site 506 below). The Iron Age series show considerable similarities though many differences in detail with the earlier phases of the Iron Age of Borno, and apparently with all the Iron Age materials known from the Diamaré, but characteristically Sao features of the later Iron Age of

the peri-Chadian area, for example the use of large carved wooden roulettes to decorate pottery, are not present in our series, nor do these include terracotta figurines. If CONNAH's (1981) dating is correct, this would suggest that from about AD. 700 the cultures in the northern Mandara and the Diamaré began to develop more or less independently of those to the north, or more probably were excluded from the trend towards the development of complex societies and states that is likely to have been taking place in the immediate vicinity of Lake Chad.

TEST EXCAVATIONS

Site 506 (UTM 1240.3/413.2)

The Neolithic site tested is located about 1 km north of the Bama ridge and close to the frontier with Nigeria. It represents a camp over a hectare in extent that was probably occupied for a relatively brief period of time. The single cultural horizon is about 20 cm thick and is both over - and underlain by fluviolacustrine deposits. It is this that makes the site especially interesting since, at some time after the Neolithic occupation, this part of the Chad basin must have been subjected to flooding on a relatively large scale. Unfortunately we obtained no charcoal, and the three TL dates run on pottery from the site give erratic results, the earliest being AD 10 +/- 190 (Alpha-1875), the other two much later : (Alpha-1877) AD 390 +/- 140 and (Alpha-1876) AD 1310 +/- 70. However the sherds sampled have anomalously high uranium and thorium contents, possibly reflecting post-depositional mobilization and concentration of these elements in the site. According to Dr J.J. STIPP of Alpha Analytic Inc. (pers. comm.), there is a growing (but still sparse) accumulation of data suggesting that where thermoluminescence dates appear far too young, they are generally accompanied by anomalously high dose rates. Given the nature of the occupation and the

likely time of arrival of iron technology in this region, we reject the two later dates, and accept the earliest one only as a minimum age estimate. We may note that the earliest reliable date for the Neolithic of Borno is about 1000 BC and that although the appearance of iron is very poorly dated, CONNAH (1981) suggests the first centuries AD/BC for this important event.

The pottery from site 506A, while not yet studied in detail, is finely made and decorated mainly with comb impressions. It is stylistically very close to the Bornoan materials, and cultural similarity is confirmed by the presence of stone axes and one terracotta figurine of Bos. WILSON has identified bones that could be of domestic cattle among the faunal remains, and is confident of the presence of domestic sheep/goat.

The main problem of the site can be summarized as follows. If it is of the relatively late date suggested, or even a thousand years earlier, to what climatic (or possibly tectonic ?) event are we to attribute the overlying fluviolacustrine deposits ? It is unlikely that during any humid episode later than that registered in the Chad basin at ca 1500-1000 B.C. (SERVANT and SERVANT-VILDARY 1980 ; MALEY 1981 : 144-146), when the lake rose to 285-290 m, there would have been sufficient fluviolacustrine activity in this locality to have accumulated some 30 cm of deposits over the cultural layer. If this is the case, we may have evidence of a Neolithic earlier than is at present known from Borno or elsewhere in the southern periphery of the lake.

Site 523, Mehé Djiddere (UTM 1215.5/426.0)

This site, to the northeast of Mémé, is well located for a mixed farming community on the edge of an area of alluvial flats that offer pasturage and fields for the growing of sorghum in the dry season. Wet season arable land and wood for building and fuel are also plentiful. Water, probably stagnant for part of the year, is nonetheless immediately

available, and the channels that run by the site offer some opportunity for fishing. Mehé Djiddere is the largest of four Iron Age mound complexes found in this locality. It comprises at least 17 mounds that vary from less than 1 m to over 4 m in height and from 15 m to 50 m in maximum dimension. These cover an area of about 7 ha, representing, if they are all more or less contemporary, a very large village or even a town.

The Fulani inhabitants of Mehé Djiddere hamlet attribute the site to the "Sao". Enquiries among the Wandala carried out by the ethnologist Hermann FORKL (pers. comm.) elicited no more precise information. Of especial interest is a variable dense scatter of iron slag over much of the site, implying iron smelting on a scale sufficient, one might imagine, to supply not just the immediate settlement but a considerable area round about. The ore used was presumably sand-sized particles of magnetite, which derive from the hills and are concentrated in stream beds after every storm.

Two test excavations, a 3 x 1.5 and a 3 x 1 m trench, were made respectively on Mound I, the largest at the site and located at its northern end, and on the much smaller Mound VII, 400 m to the south. A further 1 x 1 m pit (Z) was excavated between Mound I and its nearest neighbour. Mound I gave a sequence over 4 m in depth - the base was not quite reached - consisting essentially of midden deposits with no evident stratification in its upper part, and of an extremely complex series of pits, other features and largely disturbed structural remains below. The lack of recognisable stratigraphy may be attributable to the use by the former inhabitants of housing largely made of organic materials rather than daub. The frequent planting, removal and replanting of posts could be a major factor in preventing the development of coherent strata. (As we excavated, we frequently believed that we had found significant changes in the deposits and designated new levels accordingly, only to find as we continued downwards that there was no real change. Redesignations

of levels will be necessary.) Mound VII offered a similar but shorter and less complex sequence. Pit Z revealed over a metre of deposits containing quantities of cultural materials, which overlay a virtually sterile clayey sand. The quantity of prehistoric artefacts present at the site must on this evidence be truly enormous.

Very large amounts of pottery, iron slag and burnt clay, the latter including tuyere fragments and pieces of burnt daub some of which are probably pieces of furnace, constitute the majority of the cultural remains. Stone grinding equipment is present. The faunal remains, numerous and very well-preserved, represent a wide range of species. Studies of carbon and nitrogen isotopes in the faunal materials are about to get under way. They will help us to reconstruct the food chain and may also provide evidence of human impact through time on the environment. Preliminary inspection of the artefact series indicates that there are differences between the small find inventories of Mounds I and VII, including the presence of ceramic lip plugs/ear spools in the latter, which may be indicative of social/ethnic diversity at the site, or that parts of it were occupied at different times. Our first impressions of the pottery sequences from the two mounds, on the other hand, are that they are very similar and that there appear to be no breaks in development. They show both generalized and specific resemblances to other Iron Age materials collected from surface sites on the plains around the northern fringes of the Mandara.

Charcoal samples submitted for radiocarbon dating gave the following results :

	Layer	Depth BS (cm)	Date A.D. (5568 yr half-life)	Sample N°
Mound I	2:30-45 cm	75-90	1790 +/- 170	S-2677
	4:90-105 cm	255-270	1495 +/- 155	S-2676
	5:15-30 cm	345-360	875 +/- 165	S-2675
Mound VII	3: 0-15 cm	95-110	930 +/- 165	S-2674

We infer that since S-2675 comes from near the bottom of Mound I, but still some 50 cm above the base of the excavation, and since it is supported by S-2674, occupation at this site is likely to go back at least to the 9th century A.D. Even at this earliest stage the site seems likely to have covered several hectares and to have been an important settlement. There is no detectable period of abandonment or break in deposition between S-2675 and 2676, which are separated by only 75 cm of deposit, and, given the large error figures, the substantial lapse of time between them may be more apparent than real. S-2677 indicates that the site may well have continued to be occupied until after the establishment of the Wandala State in the 16th century or before (MOHAMMADOU 1982; FORKL 1983).

If our first impressions of the ceramic sequences are borne out by subsequent analyses and other evidence, then Mehé Djiddere and the nearby mound complexes testify to long term stability of a successful and relatively complex Iron Age society on the plain to the north of the Mandara mountains.

CONCLUSIONS

The Neolithic occupation of the research area would seem to have been concentrated to the north of the mountains. Numerous traces, but only traces, were found in road cuts along the main Mora-Waza highway, where they occurred in a variety of stratigraphic contexts and under tens of centimetres of deposits. There is here again the strong suggestion that part at least of the Neolithic period preceded a significant lacustrine episode. A Neolithic site, presently undergoing erosion, was also found on the right bank of the Mayo Ngassawé on the 2 m terrace. The Neolithic materials were

here mixed with those of a later Iron Age occupation and there appears to be no depth of deposit. The 529B quarry site is located just to the south of Mozogo on the edge of the Mayo Moskota plain, but we found only rare and isolated pieces on the plateau and in the mountains, some of which were said to have come from Kapsiki country to the south. The virtual absence of Neolithic sites in and around the massif and foothills may well be a function of very high Iron Age population densities and consequent destruction or burial of sites.

In order to understand the Neolithic period we require much more geoarchaeological evidence and also data from palynological studies on the flora of the period. The impenetrable Gokoro Forest Reserve on the plain immediately east of Mozogo suggests that in the past, and especially in the probably more humid Neolithic, the plains south of the Bama ridge would have been quite markedly more forested, and are likely for this reason to have been less than hospitable to peoples relying to any substantial extent on their herds. The higher country would presumably have been less heavily vegetated, and the forest there would have been easier to clear. We might therefore expect the hills to have been occupied early, and it only remains to find sites that have escaped subsequent erosion and destruction by man.

It is worth noting that in several parts of the area, both in the plains fringing the hills and in the southern part of the plateau, we were informed by older men that in their youth forests covered much of the countryside. A great deal of clearing has taken place during the colonial and independence periods.

We have as yet no idea whatever of why the Neolithic ended, nor how or by what it was replaced, probably at about the turn of the eras. The contrast between the simple forms of the comb-impressed Neolithic pottery and the more varied, often rouletted, and generally less well-made Iron Age wares is very marked, and we have found no series that can be considered in any way transitional. This would tend to suggest a replacement, if not of actual populations, at least of

subsistence economies and of pottery (among other) production systems. Since, however, we are as yet unable to identify an early Iron Age period, this remains speculation.

With the later Iron Age, which we may for the moment consider on the evidence of Mehé Djiddere to have begun around the 9th century A.D. or before, we are on rather firmer ground. It appears probable that it is to the apparently massive population increase in this period that are to be attributed the colluvial aprons around the base of the mountains that obscure traces of earlier periods (WILSON this volume). The great majority of the survey samples, which give us some control over cultural variation through space, are attributable to this period. Not only has JONES (n.d. b) offered evidence that there is a degree of spatial correlation between ceramic clusters and the major ethnic groupings of today, but if we have not misread the Mehé Djiddere materials and if they are at all representative of the region as a whole, then the region has been characterized for over a millennium rather by *in situ* development than major migrations and replacements of ethnic groups. The northern Mandara is not a refuge area. This is not to deny what appears amply demonstrated by oral traditions, that the mountains and plateau have an occasion served as a refuge for groups from the plains (e.g. LEMBEZAT 1961 : 10-16) but to make the point that the archaeological evidence to hand would seem to imply that such immigrants were relatively few in number, and that they were assimilated by the societies already established. To this it might reasonably be objected that the rate of site destruction and burial in and at the feet of the mountains may be so high that our most ancient pottery samples are a century or two old, and that "cultural stability" might well exist over such a short period. The reconstruction proposed is however supported by the coherent distribution within the region of numerous languages of sub-branch A of the central branch of Chadic that must surely have diversified very largely in place (BARRETEAU *et al.* 1984). It is worth emphasizing

that Wandala is one of these languages and is in fact closely related to Podokwo, implying that the emergence of the Wandala state is most unlikely to have been accompanied by major movements of population into the region.

Finally we may note that if, as is generally believed (DAVID 1976 : 257-258), the appearance of early Chadic languages in sub-Saharan Africa is to be associated with the immigration into the Sudan zone of Neolithic herdsmen from the southern Sahara, then it is perhaps surprising that there appears to be a complete rupture in the northern Mandara region between the Neolithic and the Iron Age. Do the modern languages of the region represent not the first but a subsequent stratum of Chadic speech ? More archaeological research and lexicostatistical analyses of the differentiation of the languages of the area, combined with cautious use of glottochronology, may help to resolve this question.

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TABLES and FIGURES

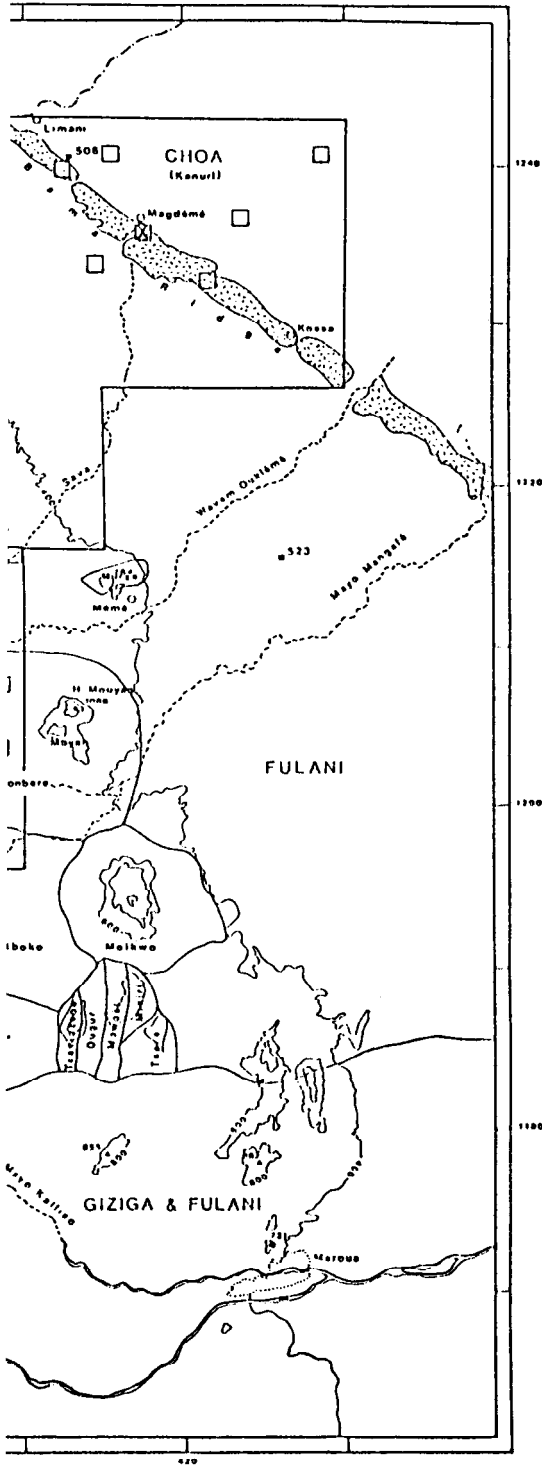


Figure 1. - Map of the northern Mandara region showing general topography, the four survey blocks of the research area, distributions of ethnic groups, probability survey squares and excavated sites.

Open squares were surveyed during the 1984 season.

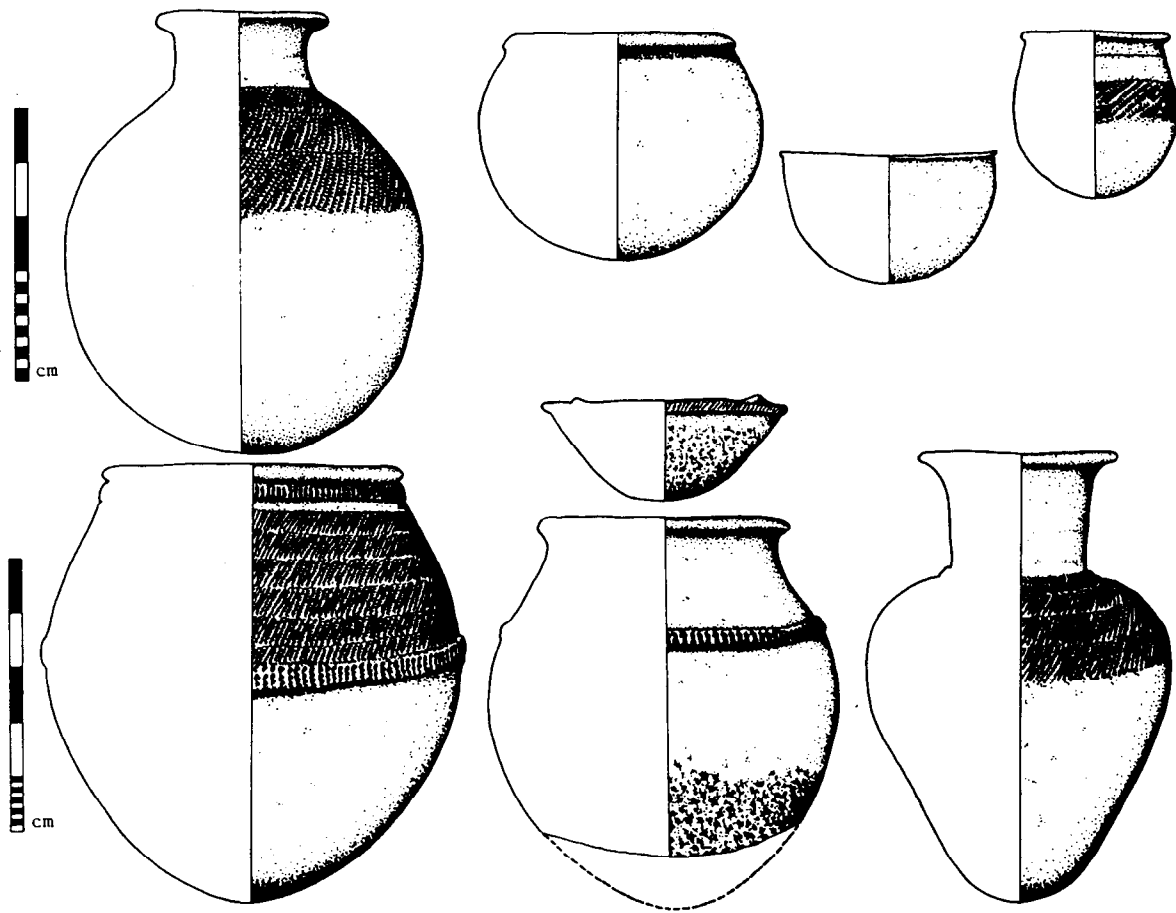


Figure 2. - Pottery manufactured by Mafa potters in Mora. (Scales by row as indicated).

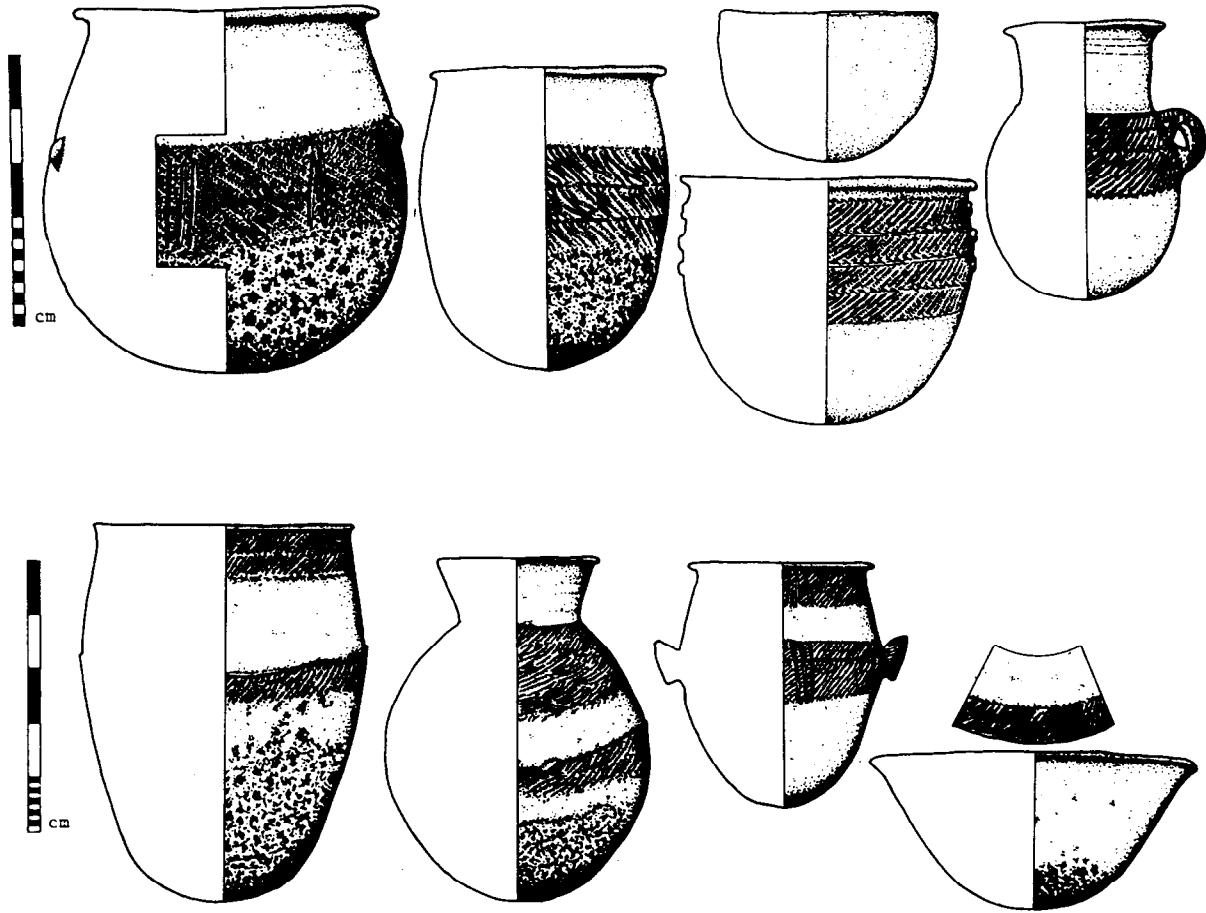


Figure 3. - Pottery manufactured by Lirdi Mora potters and sold in Mora. (Scales by row as indicated).

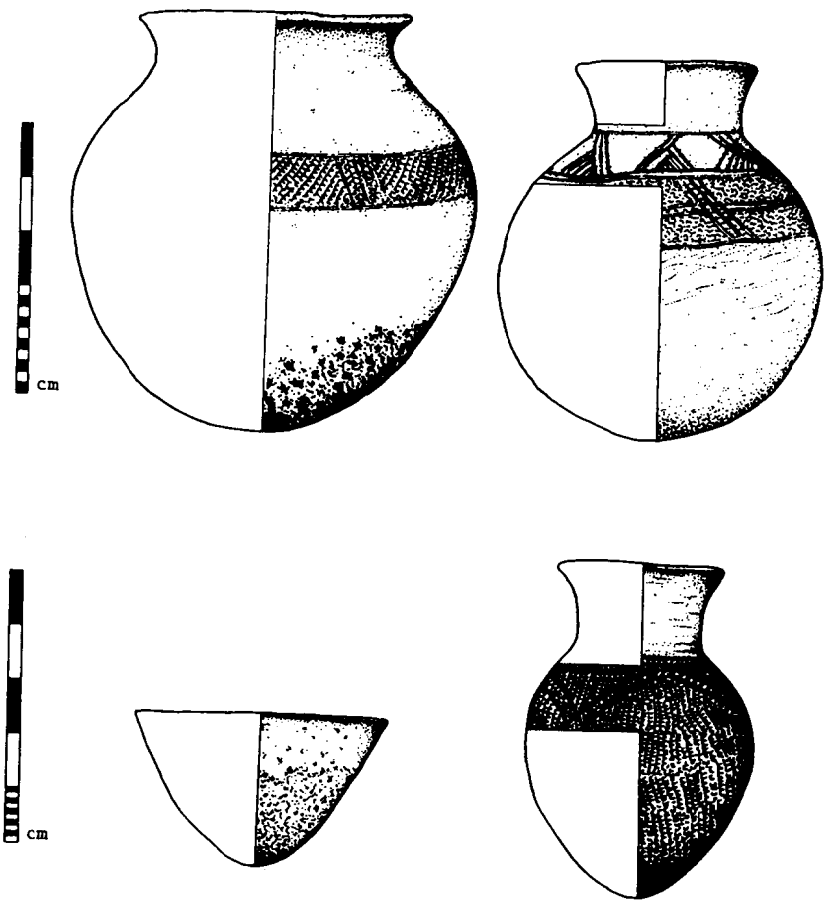
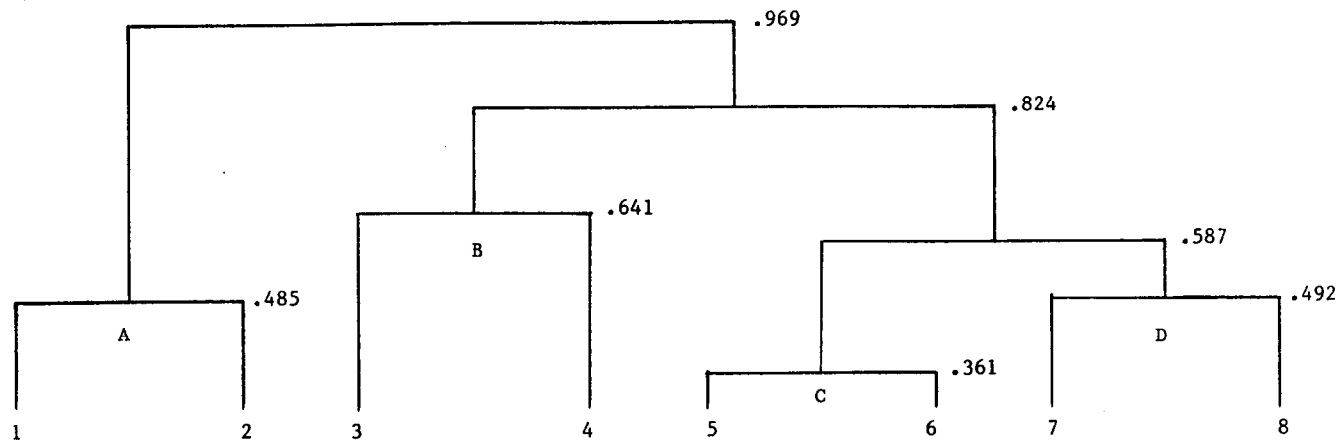


Figure 4. - Pottery manufactured by Kanuri potters and sold in Mora. (Scales by row as indicated).



Eastern S. Central survey block - on plateau, hills, and adjacent plain.

Podokwo, Muktele, Mada, Muyan and Zulgo territories.

Western S. survey block with outliers to north and east - on plateau.

Southern Mafa with one northern Mafa and one Gemzek outlier.

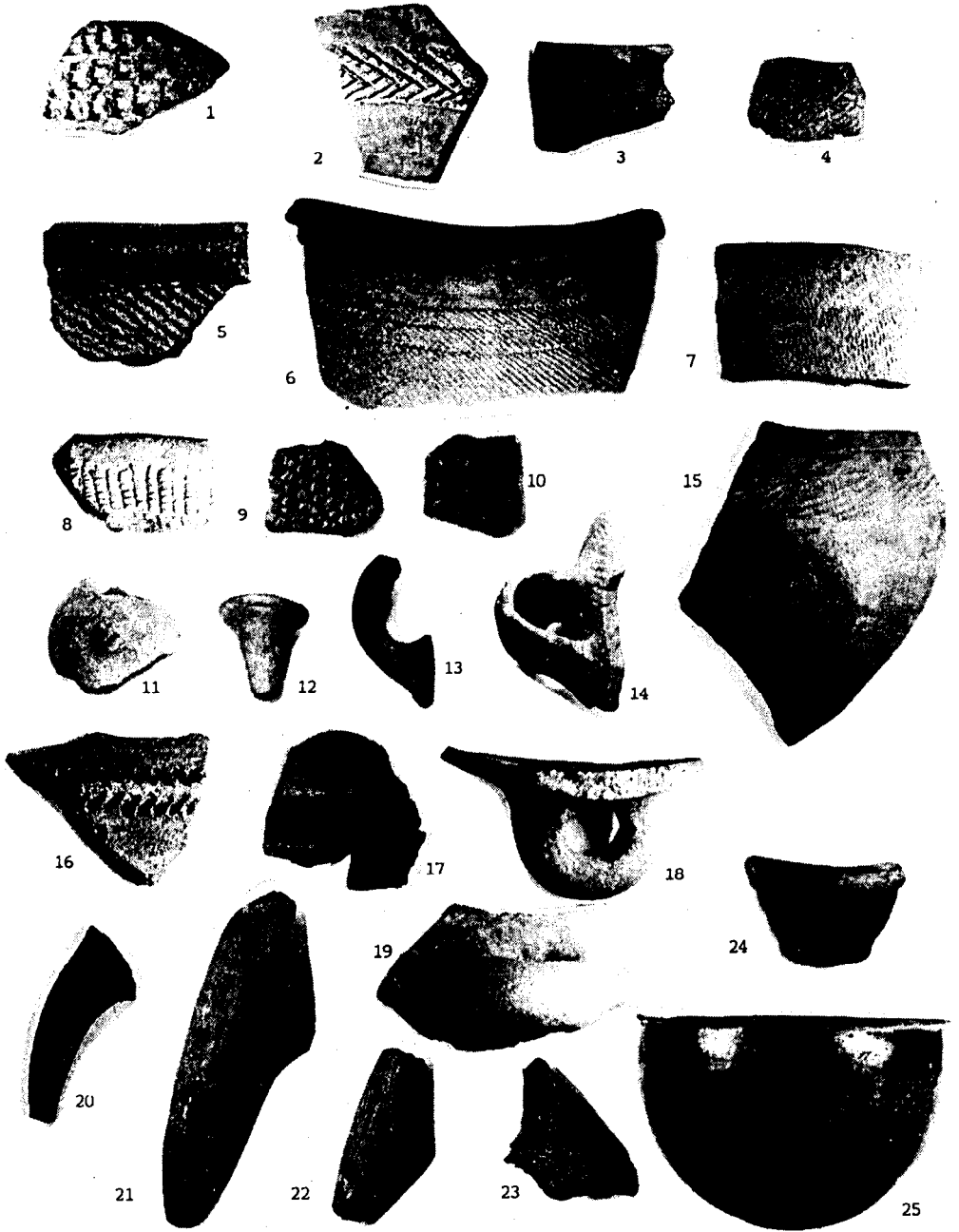
Western S. Central survey block - hills and foothills.

Northwest Mafa with one outlier on Bama ridge.

N. and N. Central survey block - on plains and foothills.

Mandara (+ Choa) with one Muyan outlier.

Figure 5. - Higher (A-D) and lower (1-8) order clusters revealed by CLUSTAN analysis of the Iron Age ceramic samples from the probability survey. Coefficients are shown together with indications of the distributions of clusters by geography and topography, and in relation to the territories of ethnic groups.



N°	Family, branch, group	Language	Ethnic group
100	Semitic Chadic, central branch, sub-branch A . Wandala group	arabic	Choa
111	E. subgroup	wandala	Wandala (Mandara) (Kirdi) Mora
113	W. subgroup . Mafa group	parəkwa	Podokwo
131	NE. subgroup	pəlasla	Vame-Mbrema
132		mbuko	Mboko
141	NW. subgroup	matal	Muktele
151	S. subgroup	wuzlam	Uldeme
152		muyang	Muyang
153		mada	Mada
161		zəlgwa	Zulgo Gemzek
163		merey	Meri (Mofu of)
173		north mofu	Durum
181		cuvok	Mafa (Cuvok)
182		mefele	Mafa (Bulahai)
183		mafa	Mafa
191		psikye	Kapsiki

Table 1. - Language and ethnic groups part or all of whose territories are within the research area (see Fig. 1).

Language numbers are those of the *Atlas linguistique du Cameroun* (DIEU et RENAUD éds., 1983); grouping follows BARRETEAU (1978).

◀ Figure 6. - Selected ceramic attributes shown in various views and scales.

1. Comb stamping - 2. Incised band - 3. Appliqué band with cord-wound stick impressions - 4. Unidentified fibre roulette - 5-6-7. TGR - 8-9-10. Varieties of KPR - 11. Small lid - 12. Flask stopper - 13. Vertical loop handle - 14. Mora handle with TGR - 15. Doulo handle with KPR - 16. Appliqué band with broad incisions - 17. Incised flange - 18-19. Horizontal loop handle - 20. Wide angle tripod leg - 21-22. Narrow angle tripod legs - 23. Neck base of narrow-mouthed flask with KPR - 24. Mafa bowl fragment with band of comb stab-and-drad decoration below the rim - 25. Undecorated Mafa bowl.

TOPOGRAPHY	ETHNIC GROUPS						n
	Choa	Mandara	N. Kirdi*	Mafa	S. Kirdi**	Kapsiki	
Chad plain	153	10					163
Bama ridge	34	10					44
Plain	117	276		112	32		537
Riverine	8	2					10
Inselbergs		11		7	7		25
Massif foothills		87	44	134	35		300
Outer massifs			70	129	75	1	275
Inner massifs			15	60	1	2	78
Massif plateau			104	348	110	6	568
n =	312	396	233	790	260	9	2 000

Table 2a. - The distribution of 1 km squares in the research area by major ethnic groupings and topography.

N. Kirdi* = Podokwo, Uldeme, Muktele, Mada, (Kirdi-)Mora, Vame-Mbreme.
 S. Kirdi** = Zulgo, Mbuko, Gemzek, (Mofu of) Meri, Durum.

TOPOGRAPHY	ETHNIC GROUPS				n
	Mandara + Choa	N. Kirdi	Mafa + Kapsiki	S. Kirdi	
Chad plain	3				3
Bama ridge	3				3
Riverine	2				2
Plain + Inselbergs	4		3	1	8
Massif foothills	3	2	3	2	10
Massifs and Plateau		4	5	4	13
n =	15	7	11	7	39

Table 2b. - The distribution of the random sample of survey squares (stratified by grouped topographic and ethnic variables).

TECHNIQUES/ FEATURES of DECORATION	Kirdi-Mora	Mafa	Kanuri
Impression			
Twisted string roulette (TGR)	+++	+	-
Knotted strip roulette (KPR)	+	+++	+
Row(s) of punctuate impressions	++	-	-
Comb stab-and-drag impressions	-	++	-
Incision	+++	++	+
Appliqué			
Nipples/buttons	++	-	
Bands, finger impressed	-	++	-
Bands, incised	-	++	-
Ridges, incised	-	+	-
Burnishing	+++	+++	+
Slipping	-	++	+
Blackening	-	++	-
'Stucco' plastering of lower body	+++	+	+
Mora-type handles	++	-	-
N pots	17	18	7

Table 3 - Techniques and features of decoration present in the modern samples of Kirdi-Mora, Mafa and Kanuri pottery recorded in Mora. In the case of the larger Kirdi Mora and Mafa samples only: +++ = common ; ++ = present ; + = rare. (See also Figures 2-3).

CLUSTER	DECORATION	MORPHOLOGY	FEATURES	n SAMPL.
1	Incisions TGR KPR Punctuations	Short-necked wide-mouthed jars with flaring rims	Doulo handles Flask stoppers	5
2	TGR Incisions KPR	Neckless jars with incurved rims Narrow-necked jars with flaring rims	Wide angle tripod legs	6
3	KPR Comb stab-and-drag Burnished black interiors	Neckless wide-mouthed jars with flaring rims Mafa bowls		4
4	KPR Burnished black interiors Appliqué buttons, knobs, bands, ridges Comb-stamping	Short-necked wide-mouthed jars with flaring rims	(Sub-)vertical loop handles Narrow angle tripod legs	4
5	TGR KPR Burnished black interiors Red slip/wash +/- burnish	Short-necked wide-mouthed jars with flaring rims	(Sub-)vertical loop handles	3
6	Incisions KPR	Short-necked wide-mouthed jars with flaring rims	(Sub-)vertical loop handles	5
7	Punctuations KPR Red slip/wash +/- burnish Incisions TGR Comb stab-and-drag	Hemispherical bowls Tall-necked jars with flaring rims Neckless medium-mouthed jars with flaring rims	Narrow angle tripod legs	3
8	KPR Red slip/wash +/- burnish			11

Table 4. - Characteristic attributes of ceramic clusters present in half or more of the samples of each cluster.

TGR = Twisted string rouletting (see SOPER 1985 for definition) (Fig. 6:6-8).

KPR = Knotted strip rouletting (SOPER 1985), (Fig. 6:9-11).

Mafa bowl = a bowl, deeper than hemispherical, characteristically blackened and burnished inside and out, usually with a band of combed stab-and-drag decoration just below a thickened rim (Fig. 6:25-26).

Doulo handle = a V-shaped handle, applied horizontally but with the point of the V drawn upwards and curved inwards, attached to the middle or upper body of the pot and decorated with KPR (Fig. 6:16).

Wide angle tripod legs = legs splayed so that the angle between them and the vessel wall is relatively wide (Fig. 6:21).

Narrow angle tripod legs : legs meeting the body at a narrower angle than the above, and usually larger (Fig. 6:22-23). The end attached may terminate in a shoulder or form part of a decorated flange (Fig. 6:18) running round the pot.