

CAMEROON

Refuse disposal and mound formation: An Ethnoarchaeological approach in Northern Cameroon

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The plains surrounding the Mandara Mountains of Northern Cameroon are little known archaeologically. The Projet Maya-Wandala has undertaken the task of exploring this region with hopes of expanding knowledge of state formation, especially of the Wandala state. Researchers are looking at the archaeological record of the region with special emphasis on the Iron Age. One feature of the archaeology of the area is the presence of numerous mound sites. It is not clear how these mounds were formed, but one hypothesis is that they are the remains of the refuse heaps of the Sao (the common term for the ancient inhabitants of the region).

During the summer of 1996 I conducted a small ethnoarchaeological project in hopes of shedding some light on the site formation processes involved in mound development at the site of PMW 642, located near the village of Aïssa Harde, Extreme North, Cameroon. This ethnoarchaeological survey was successful in demonstrating how present refuse disposal patterns could result in mounds, as well as in illustrating how general disposal patterns may affect the data that archaeologists collect. Furthermore, oral history collected during the course of field work warns that the direct historical analogy of refuse disposal must be applied cautiously. The latter part of the twentieth century has brought with it new demands and new elements of material culture which are slowly changing the relationship peoples have with their refuse. Before proceeding, the following definitions will be useful. These definitions were adopted from Staski and Sutro (1991) and will be utilized through out the discussion. Refuse is defined as a useless and thus abandoned byproduct of human activity. Disposal behavior refers to the "patterned actions directly associated with management of refuse" (Staski and Sutro 1991:4).

The Study Area

The area surrounding the inselberg near the village of Aïssa Harde has extensive Iron Age deposits. The inselberg itself also has archaeological evidence of Iron Age occupation. Dates from the 1995 field season from site PMW 636 suggest that iron using people were in the area possibly as early as 2500 BP (MacEachern 1996: pers. comm.). Holl (1993) also extends the antiquity of the Iron Age in the region and defines the Early Iron Age as 500 BC to AD 700 in the province of Extreme North, Cameroon. Similar midden or mound sites are to the one at Orissa Harde are known from Northeastern Nigeria and elsewhere in Northern Cameroon. In these areas the matrix of the mounds contains similar archaeological material such as ash, living floors and human remains. Thus a contribution to the understanding of these mound features will have an impact, not only on the archaeology of this site in particular, but will also have regional implications. Research was conducted during the months of July and August of the 1996 archaeological field season. This period falls within the rainy season in Extreme North. The study took place in the village of Aïssa Harde and the neighboring village of Aïssa Tardon. These villages are located a few hundred metres from the archaeological site. The ethnoarchaeological data was collected during an eight to ten day period spread over this season.

Methodology

The basic method of research was ethnographic survey. The garbage dumping habits of the village were examined through interviews with informants, by physically examining dumps and taking photographs. Adama, my translator/guide during this research, is a resident of Aïssa Harde and has worked on the archaeological crews during both the 1995 and 1996 field seasons. He thus understood both the cultural and the archaeological aspects of the study. Informants who were surveyed for their present refuse disposal behavior were questioned about the number of people in their compound, the ethnicity of the members of the household, where they disposed of their garbage, how often they participated in this behavior and what materials were involved.

Sample

The residential disposal patterns of over 103 individuals living in a total of nineteen households are represented in this survey. Thirteen of the nineteen household representatives surveyed were ethnic Mandara. This includes five informants who were chosen because they were elders who had lived in the village for a long time and could comment on changes in refuse disposal over the course of their lifetimes. On two occasions a family was surveyed because of the particular quality and quantity of their refuse. In general the households in the survey were chosen for study based on ethnicity, availability for interviews, and sometimes by age. In terms of ethnicity, Mandara, or Islamic, households were selected because of their relationship to the Wandala state and their general longevity in the region. Households of animist and Christian montagnard groups were initially surveyed to see if their behavior was similar to that of their Muslim neighbors. Looking back, I now believe that households located along large, frequently used paths may be over represented in the survey.

Results

What will now follow is an account of the disposal behavior of the people of Aïssa Harde and Aïssa Tardon and what of this behavior can reasonably be extended into the past to help explain the deposits present in the archaeological record. Aïssa Harde and Aïssa Tardon are both multi-ethnic villages with at least eight ethnic groups represented between them. There are Mandara, Fulani, Kanuri, Vame, Gisiga, Zoulgo, Mada and Mafa peoples present. The *quartiers* of the village are not drawn exclusively along ethnic lines. In fact, religion seems to be more of a determining factor of where a family lives than is ethnicity. For instance, the Mandara *quartier* of Aïssa Harde is far from exclusively ethnic Mandara, but is exclusively Muslim. Again, the Mada population is split into three *quartiers*: one near the Catholic mission, one near the Adventist mission and a third group of animists. Most non-Muslim ethnic communities are new to the area. Many of these groups were relocated under a government program approximately thirty years ago. Thus one factor in the process of determining if the present disposal behavior has any antiquity in the area will be to determine

if these mountain peoples have made an impact on the local habits.

The Present Picture of Household Refuse Disposal Behavior

Women do the collecting and disposal of refuse so my translator and I spoke almost exclusively to women, usually the senior wife. Senior wives were chosen as informants because all informants agreed that it was the senior woman in a compound that had the most control over such maintenance operations as location of refuse disposal. More informal inquiries with daughters, daughter-in-laws and junior wives showed that they would follow the lead of their senior in this matter. From these interviews a general picture of habits and ideas about garbage and its disposal was developed. The general pattern is the best way to describe the behavior surrounding refuse disposal because there is no single combination of behaviors that is universally present. Basically, dropping, tossing and dumping (Binford 1978) all play a role in accumulation and distribution of refuse. If there is a lot of trash and it becomes a nuisance, or is perceived as a health threat, burn it. But if it is out of sight, it is out of mind.

Dropping of refuse on the ground is an activity that all members of the population engage in and so any area that people use may have some refuse scattered on its surface. There, the sand or gravel that makes up the surface of the compound is swept clean daily by the women of the household. In the early morning hours, the village comes alive with the sound of whisk brooms on gravel. The woman then collects the debris composed of food waste from meal preparation, animal waste, and vegetative waste deposited by the wind or broken off structures along with anything else present on the ground, and collects it in an enamel pot or plate and disposes of it at her dumping site.

For some women this is a pit near their compound that needs to be filled in. Pits excavated to obtain mud to use as building materials were common. Others simply throw their refuse over their compound wall where it accumulates along the walls or in one isolated location. A refuse heap may also be discreetly placed behind a structure, but in virtually every case it was removed from the central and

Table 1: Disposal Behaviors

| Disposal Behavior | Number of Informants Engaging in Disposal Behavior (out of 19) |
|--|--|
| burning of refuse | 11 |
| never burn refuse | 3 |
| dispose of refuse at river/never burn refuse | 4 |
| utilized pits for refuse disposal | 5 |

work areas of the compound. In two cases, a pile of debris was out in the open. When questioned about it, one woman responded that it was the result of a collapsed structure made of millet stalks. She was using that location so that anyone who wanted to recycle the materials that were salvageable could do so easily. This case illustrates that provisional discard plays a role in the disposal patterns of the area. A quick look at the contents of any refuse heap shows that nothing that can be reused is present. Indeed, most of the materials present are organic, though ceramics and plastic bags do make their way into these piles once they become too damaged for reuse. This tendency for recycling has been recorded elsewhere in the world (Hayden and Cannon 1983).

The next most common step in refuse disposal behavior involves the burning of debris once it has been assembled in the dumping area. Eleven of nineteen women said they burned their refuse, but frequency of burning changing dramatically from person to person (Table 1). One individual said she burned refuse almost daily with another saying that she had not burned her refuse in over a year but assured me that she would as soon as it became 'too much'. The three women that said that they never burned refuse did not dump inside their compound. Four women also dumped material along the banks of the river but never burned it.

From the above description a general pattern is visible but it is also evident that some improvising within lines of general household dumping ideas is very much allowed. One household will gener-

ally use one location but if for reasons of sanitation or if a large quantity of trash is produced at one time, a second location can be used. Most informants cited 'too much' garbage, or the potential for unpleasant odor as a reason for burning or dumping in the river. Though the morning was the time for sweeping and burning, one could see woman adding refuse to their dumping areas during the day if a substantial quantity of refuse was produced during an activity.

The basic concepts involved in refuse disposal behavior are that it should not be unsightly or smelly in the compound. One does not want one's neighbors thinking that they are unclean. The presence of a neighbor's refuse is acceptable as long as it is not smelly or located somewhere near a highly trafficked area where it might provide a good hiding place for snakes and scorpions for example. Numerous women stated that if a refuse pile or pit became too odorous or large that the proprietor would be in danger of being targeted by health care workers for being unsanitary, as well as being the subject of unpleasant gossip among their neighbors.

Many of these same ideas are present in the garbage dumping practices of the market area. A survey of the ground in the area of the weekly grand *marché* (big market) showed a general pattern of debris where the various stalls were placed (Figure 1). The stalls stay in place week long even when the merchants are not present so the relative position of refuse in the market is easy to reconstruct. These deposits are small scatters resulting primarily from dropping of material. There are no substantial deposits in

Figure 1: Aissa Harde's *grand marché* with merchants' backs to refuse scatters near stalls.



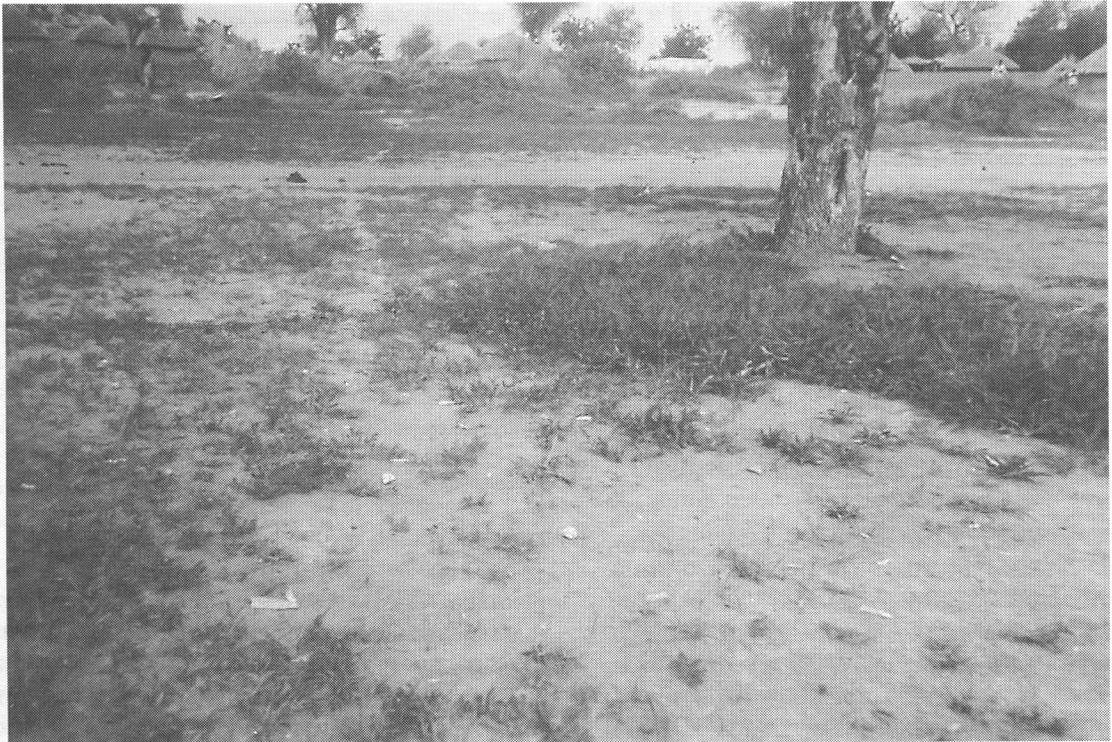
the area of the stalls. One formal dumping area does, however, exist. It is an old well that is now filled in. A general circular pattern is visible on the ground and debris is more noticeable in this area along with a slight depression likely due to settling. The lack of concentration of debris even in this area makes me believe that accumulation in that spot was quite slow and had been spread out over the fifteen years that the market has been in that location and that there is likely yet another area of disposal. The market backs onto the river and that would be the most convenient way to get rid of refuse.

One other area of interest in the market was the location of butchering. The *grand marché* has an area where butchers cut and grilled meat for customers. The surface of this area had bleached and dried bone fragments scattered along the surface in noticeably higher concentrations than the adjacent ground surface (Figure 2). There were also burned patches of ground where the meat was grilled.

Though this area must have been heavily scavenged by dogs and other animals, the fact that there was some bone accumulation is promising for the identification of some activity areas based on dropped refuse.

On the other hand, the *petit marché* is today the area where local brew is sold and drunk. Two years early the area was also used to sell a wider variety of wares including meat that was butchered to specifications on the spot as it is at the *grand marché* today. The *petit marché*, as the name suggests, has become much smaller since that time and the area where the butchering took place has been abandoned and planted by farmers. On the day of my visit, the millet planted on the location was still very sparse but the plowing and previous season's harvest had already rendered the former butchering terrain indistinguishable from its surroundings on the surface.

Figure 2: Surface scatter of bone from the *grand marché's* butchering area.



Change

The above describes the current refuse disposal situation. But has this changed since the archaeological past being studied in the mounds? To determine if there had been recent changes in patterns at Aïssa Harde, we spoke with five elderly women. The general consensus among the elders consulted was that people used one location more consistently in the past. They also said that burning was a much more infrequent activity in the past. The time range between burnings during their youth seemed to vary but from a stretch of a few months to years; or never at all instead of beginning in the range of every few days as it does today. One woman said that in the past several household would use the same refuse disposal area. She could even describe some of the locations in general terms. Another informant did say that their dump had previously been used by numerous households in the community some time over 20 years ago. It could

be important to note that this was one of the two households chosen for the survey based on the size of its refuse heap. Thus between the size of this particular refuse heap and the testimony of the elderly informant there is some evidence that accumulations in the past were both more localized and larger.

The older women cited the influence of health care workers and changing social conditions as being the reasons behind the changes. It was generally felt by the older women that younger women today were more individualistic. On the subject of health, Sutro cites the influence of latter twentieth century health care information as influencing the ideology of disposal behavior in Mexico (Sutro 1991: 18). Therefore this could, in fact, be a general ideological shift related to the ideas of twentieth century development that have caused the most dramatic changes in behavior in Aïssa Harde and not the changing proportions of ethnic groups.

Archaeological implications

Despite the modern influences just defined, there are many aspects of the present day refuse disposal patterns that could have archaeological implications in the region. The analogies that are still useful are based on the continuity of certain artifact types and certain technologies (such as butchered remains, ceramics, ash and architectural remains) as well as behaviors like the potential reuse of an abandoned structure or compound. There is also information about the relationship between humans and their environment that may prove useful in interpreting seasonality and biases in of the archaeological record.

I'll begin with some minor points about environmental and climatic conditions that affect refuse disposal behavior. Two informants stated that they consciously burned refuse less often during the rainy season because it was more difficult to do when the material was wet. The elderly informants stated that burning happened less frequently in the past but it did occur, and accumulation was previously more concentrated in one area. As a result, seasonality may be somewhat detectable by analyzing the relative concentration of charred materials throughout a sequence. Higher levels of burned material could mean that a given level was accumulated during the dry season and thus more thoroughly burned. This could be useful in spotting seasonal differences in lifestyle. It also argues for the utility of sedimentology and techniques such as flotation in the archaeology in order to record and quantify such burning. As Hayden and Cannon suggest (1983), these dumps would be excellent locations to find charred food once the burned material identifies the location as a dump site.

An environmental factor already discussed is the impact of the river on refuse. Essentially, the river removes artifactual material or a portion of refuse soon after it has been deposited by humans. In Sutro's (1991:18) study, households living within 200 m of the river were most likely to dump materials in it. The evidence gathered at Aïssa Harde would seem to indicate that it is the same there. No doubt the compounds of the four women who said that they disposed of refuse in the river would be underrepresented artifactually in the archaeological record having only their architectural features potentially left in context.

Some information was also gathered regarding specialist activities in the community. To begin, two women who made ceramic vessels during the dry season were interviewed. Both women agreed that they put pots that broke at all points in the manufacture process in the refuse disposal areas that I had a chance to examine. In neither case was a large quantity of ceramic sherds visible. This leads me to the conclusion that ceramic manufacture would not be highly visible in the archaeological record if only general household refuse disposal areas were examined. Perhaps ceramic analysis may show higher levels of flawed material that never made it beyond the potter's compound. Of course, ceramic vessels are used less frequently today than in the past so the quantities of sherds in potter's compounds and elsewhere would likely have been higher even earlier this century.

In addition to the butchering areas in the markets, the household dump of one butcher was surveyed. It had slightly higher levels of bone debris than other refuse disposal areas examined. Although these areas indicate that butchering locations may be recognizable in the archaeological record, what is more striking is the similarities that are apparent in the butchering pattern itself. In both archaeological and ethnographic context, the faunal material of domestic mammals in particular is almost always extremely fragmented as in Figure 2. Thus it would appear that the butchering pattern present today can be extended to some degree into the archaeological past.

Mound Development

One of the principle components of refuse disposal areas is ash removed from hearths. Thus an extensive accumulation of ash within the sediment matrix in a mound would indicate that it was formed at least partially by refuse disposal activities due to dumping and burning as discussed above. And indeed, ash is a common material in the mounds of PMW 642.

Another common feature in the archaeology of the region in general, and mounds specifically, is pits. Five individuals indicated that they currently use pits for refuse. One woman said that she made the pit for this purpose, but others used pits dug for other reasons. These pits "needed to be filled in"

according to the informants. Pits excavated to extract building materials were the most common. The ones I saw were all nearly full and were only visible as a slight depression or concentration of refuse on the surface. Holl (1987) says that these pits are commonly 1 to 1.5 m deep to begin. Pit features were ubiquitous in the archaeological site near the village as they are elsewhere. Holl also discusses the important role that the material removed from these pits plays in mixing in the archaeological record. That is to say that when the mud is removed from the hole to manufacture bricks, pot sherds and other archaeological materials are also incorporated into the resulting structures. This earlier material is thus likely to appear higher up in the stratigraphy than its age would actually indicate. This survey indicates that large quantities of material are also being systematically placed lower in the sequence by the filling of these pits with refuse.

Once these structures begin to deteriorate, and are abandoned, they don't only cause older ceramics caught within them to be deposited above their original chronological position. Mud brick disintegration plays an important role in tell and mound formation (Rosen 1986). Furthermore, both elderly and young informants agreed that abandoned dwellings could be used to dispose of garbage. In the village of Aïssa Harde I did not see any examples of this but one was present in the near by larger town of Mora. There, an abandoned house was being used by likely more than one family to dispose of at least some of their refuse. The rooms involved seemed to already be built on a bit of a rise. The structure had been abandoned for several years, possibly eight or more, and there was already an accumulation of debris including broken enamel and ceramic pots, charcoal and ash. As the walls of the structure continued to collapse, they added sedimentary material to the accumulation. The walls themselves seemed to be acting as a wind trap and thus speeding up the natural depositional processes affecting wind blown silts and sand. In many ways, it would seem that formerly occupied structures are ideal locations for mound development. Mounds at Aïssa Harde and elsewhere in the area (see Holl et al. 1993 for examples) contain the remains of habitation features and not just miscellaneous artifactual material, ash, pits and burials. Floors, hearths and *in situ* pottery are also found. High levels of ash,

filled pits and basically low value artifacts such as butchered faunal remains, indicate mound areas were used for refuse disposal and the presence of these architectural features indicate that they were residential as well.

To date it would seem that the survey supports the position that mound features are the result of a combination of occupational and refuse disposal behavior. One occupation followed by dumping activities may result in the formation of a rise, but how do large mounds form? It has been stated elsewhere, that this is likely due to reoccupation of the same locations over longer periods of time (Holl 1987; Rosen 1985). One informant clearly stated that an abandoned compound within the village was likely to be reoccupied sooner or later. My interpreter was hoping to make just such a move during the time that we were conducting the study. He even pointed out the abandoned compound to me in passing. The structures themselves may not be reused but the location was. In such a manner accumulations would widen horizontally and vertically. The conclusions of this reuse of abandoned structures and the reoccupation of the area at a later date indicate that the abandonment is not a final stage in the cultural processes of site formation here but that it is "dynamically linked" with other behaviors in this case and others around the world (Brooks 1993:178).

Reasons for later occupation may also be related to the topography of mounds. High spots have been cited elsewhere as good wetland homes (see Sullivan and O'Connor 1993 for examples). Holl (1987) says that this appears to have been the case in the Perichadian plain in the Neolithic and Iron Age and even the Islamic period with some mound sites such as at Houlouf still occupied today. This could mean that the former occupants of the mounds at Aïssa Harde were part of larger cultural network that was predisposed to live on higher ground if it was available. The mounds are located close to the inselberg which itself has evidence of occupation (though these are undated for the moment). This is not to say that the mound builders were creating mounds intentionally, but simply that the results of the accumulations from previous occupations made attractive homes and thus were reoccupied all that much more often.

Another likely significant factor in mound formation was not observed as a formal part of the

survey but is none the less potentially important. In larger nearby communities, such as Mora and Maroua larger garbage piles are visible on the street and the markets. Since the size of a settlement should not affect the size of the waste produced by an individual household or merchant, other explanations must be found. Higher population density could very well cause the increased density of garbage as well. If this is so, it is possible that the mounds at PMW 642 and elsewhere were at least partially formed during periods of more intense occupation with larger populations. It has already been suggested that Aïssa Harde was larger in the past (MacEachern 1996 pers. com.).

Thus it can be concluded from ethnoarchaeological observations in Aïssa Harde and nearby sites, as well as through discussions with elderly informants that the mounds of PMW 642 could be the result of refuse disposal, but other behavior such as dwelling construction and abandonment as well as activities of everyday life also placed a role in their development. The study of mound building at this site and others is most likely linked to refuse disposal and land use over a long period of time and must be interpreted with this in mind.

Further research

Much more information could be learned about the archaeology of the region through ethnoarchaeology. In terms of mound formation in particular, it would be informative to learn more about the ideology of habitation location in particular in terms of how it relate to past occupations and to high ground. Finally, a more extensive survey of dumping grounds in communities of various sizes with a quantification of the refuse in terms of actual size, content and rate of accumulation would be very useful.

Summary and conclusions

This ethnoarchaeological survey was conducted to use refuse disposal information to explain mound features at PMW 642 and other mound sites in the vicinity. Interviews with informants indicated that some changes had occurred in recent decades in refuse disposal behavior and that these changes were likely due to changing ideas about sanitation brought about by health care workers and other outside modernizing influences. At the same time, there are factors in the present situation that can be applied to the archaeology. These include the contents, or materials, present in refuse heaps such as ash, ceramics and bone as well as their locations relative to activity areas in the ethnographic present all of which can help identify refuse in the archaeological record. Techniques associated with refuse disposal such as the use of pits, old wells or abandoned buildings as disposal locations also illuminate some of the complexities in the stratigraphy of the mounds. These factors could play a role in mound formation particularly if the site had a larger population and was more densely occupied than the present day village of Aïssa Harde.

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