Present-day "kitchen middens" in Ghana

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In the course of a stay in Ghana from August 1964 to August 1965, during which I was a member of a group studying urbanization problems for the Geographical Institute, University of Copenhagen, I was able to travel through the northern areas of the country. I briefly visited these areas again during a second stay in Ghana in the spring of 1967. Both journeys took place in the last part of February and the early part of March.

In the course of a visit to the village of Birifu (fig. 1), about 12 km south of Lawra in the northwestern part of Ghana, we went by canoe down the River Volta. During this trip I noticed some shell heaps along the riverside and, on going on land, discovered that they originated from shell-fish gathering. The shells were all those of an oyster-like shell-fish, locally called an "oyster", which was later identified at the University of Accra as *Egeria radiata* (fig. 2). These present-day "kitchen middens" aroused my curiosity to search further information as to their origin.

Shell-fish gathering in Northwest Ghana

Northern Ghana lies in the savannah zone of the tropics. The river Black Volta forms the border between Upper Volta and Ghana. On either side of the river there are flood plains up to 2 km broad and bounded by a 30 m high laterite plateau. Although the region is rather densely populated there are few proper villages. The inhabitants live in farms scattered evenly over the landscape, each surrounded by its own cultivated area (fig. 3). The majority of the population live on agriculture, supplemented by the holding of a few hens and goats and by hunting and fishing. Shell-fish are collected mostly in the dry season, from December until the beginning of May.

It is important for shell-fish gathering that the water should be clear, shallow and not too cold, since the fishermen often remain in the water most of the day. Consequently, the best time for shell-fish gathering is at the end of the dry season, from February until May, when the river is at its lowest. There is little farm work during this period and so there is time for hunting and fishing. Shell-fish gathering provides both a supplement to the diet during a period when food is scarce and a commodity which can be sold to people farther inland.

In the Birifu district the shell-fish are collected by men, because hippopotamus and crocodiles make it dangerous. Elsewhere in Ghana it is typically women's work. The men wade out into the river and dive for shell-fish in 2-3 m water, they are able to stay under water for up to 1½ minutes. The shell-fish are loosened from he bottom by means of a chisel (fig. 4) which is struck with an apparently rough stone the size of a fist. With time the hammering wears a hollow in the stone (fig. 4). Tough rocks are preferred to quartz. The latter is very common as residual rock after weathering, but is brittle and inclined to shatter. The stone must be big enough to give the under-water blow sufficient force. The shell-fish are collected in a basket (fig. 5) carried by means of a cord over the shoulder. One man can gather from two to six baskets full, each of about 200 shell-fish, per day. The full basket is emptied on the beach, where women boil the catch for 8-10 minutes in big jars (fig. 6). The softs parts are removed from the shells, and are carried in baskets home to the farm, where they can be processed further by drying or smoking. The shell-fish are then ready for domestic consumption or for sale in the local market. The smoked shell-fish can keep for as long as one year in jars with close-fitting lids.

The shells are too heavy to carry all the way back to the farm, which often lies several kilometres away. For this reason the shell-fish are boiled and shelled on the river banks, and the shells are left there. The shells we first saw from the canoe were from heaps which had slid down the river bank. In the dry season the level of the river is 5-6 m below the surface of the flood plain. On top of the bank lay several big shell heaps, and a closer examination revealed that they were composed of many, smaller heaps 50-60 cm high (fig. 7) forming a circle round a fireplace. The heaps partly over-lapped each other. Similar circles were seen nearby. A circle is formed because the empty shells are thrown in one direction one day and in another direction another day. Several 30-40 cm thick shell layers

were visible in the river bank where they alternated with 30-40 cm thick layers of river deposits (fig. 8). When the river rises during the rainy season it sometimes overflows the shell heaps on the bank forming a kind of "varv" (stratified deposits), which can be used to give a rough estimate of the time it takes to produce a shell heap of a certain size. A reliable estimate, however, would necessitate a stay of at least one full year so as to measure the amount of shells that are washed away during the rainy season. Then there is the possibility that good oyster beds will shift from time to time with the result that the shell heaps are spread over a big area. Finally, the local people stated that the water level did not reach the shells every year. This means that one layer of shells might very well originate from two or three seasons.

Pottery

During my stay at Birifu I made enquiries about the collecting methods and the tools used. Unfortunately both visits took place early in the season, before the gathering had started properly and I did not see the boiling and preparation of the shell-fish. However, I saw the jars that are used and how they are made. The jars are short-necked, broad-shouldered and have rounded bases (fig. 6 and fig. 9); the surface is smooth and shiny with colours ranging from reddish brown to black and the walls are about 1½ cm thick. The jars are made of clay with a substantial content of gravel (diameter up to 3 mm), which has the effect that the ware does not crack so easily under the large variations in temperature. The clay is excavated from pits and connecting corridors dug into the weathered granite. At a certain depth, here 2-3 m below surface, a suitable mixture of clay and partly decomposed rock is found. The excavated clay is carried in baskets balanced on the head into the houses where the bigger pebbles are sorted out and thrown away. The clay is put into big jars and kept constantly moist.

When making a jar the woman first takes a potsherd, preferably an old base and places upon it a lump of very wet clay which is constantly moistened during the process. She hollows out the lump, takes a handful of clay, presses it like a tube of toothpaste, and puts it upon and outside the lump while smoothing and pressing from the inside. In this way the jar is modelled up, while being rotated slowly on the old base, which functions as a primitive potter's wheel. When finished, the jar is set aside for a few days until the surface has dried sufficiently for final smoothing with a

wooden stick and then with a leaf, after which it is decorated and set aside for complete drying. The dried earthenware is now baked in shallow pits, encircled by old pots or stones (fig. 9) and with a layer of potsherds on the jars, and straw and wood on top of this again. After 5 hours' fire the jars, now burnt red, are removed from the "kiln", and the still-glowing material is sprinkled with besoms dipped in the juice of a special tree's fruit, the name of which is not known to the author, and in water mixed with bark. Where the juice soaks in, the surface becomes black and shiny.

Examination of a potsherd reveals that the surface has a thin, charred cover, perhaps originating from a combustion of fatty acids — a phenomenon also known from Danish pottery. In order to ascertain whether the assumption was correct I asked *Me Mouritzen* at the Mineralogical Museum in Copenhagen for help. She heated a typical potsherd from Birifu to 700° C (fig. 10). The black coating disappeared, and the original red colour reappeared suggesting that the black colour was not caused by a dye containing for example iron or manganese, but by charcoal.

The procedure described varies a little acccording to size of jar.

Danish kitchen middens

The observations in Ghana made me think of the prehistoric shell heaps along our old coastlines and the ones found inland at Åmosen. The latter consist exclusively of *Anodonta*-shells and some charcoal (unpblished information from *J. Troels-Smith*).

Our first knowledge of shell heaps from the Stone Age originates from a find in 1837 (referred to by *Sophus Müller,* 1900). Ten years later Japetus Steenstrup reported on a similar find (*Steenstrup,* 1848), and a committee was appointed to study the phenomenon. A long discussion started between Worsaae and Steenstrup about whether it was justified to divide the Stone Age into an older period and a younger one on basis of, among other things, the tools found in the heaps. Since then, other questions have arisen and the discussion continues. Where did the people live in relation to the kitchen midden? How long did it take to make such a heap? For how much of the year were the oysters gathered? Steenstrup thought 9 months, i.e. not during the 3 summer months, but it is widely held now (*Troels-Smith,* 1960) that the gathering was seasonal and took place during the summer months. A thorough investigation on this problem has not been made, however. Finally, one could ask: Which tools were used for gathering oysters?

Naturally, it is not possible to make direct comparisons between Danish kitchen middens and shell heaps in Ghana. But modern excavation technique is so advanced that it is unlikely that further improvement in it will reveal anything startlingly new about the middens, and it is therefore important to get new sources of inspiration with which to interpret existing information and finds. One such source is to observe present-day peoples' traditional implements and methods for fishing and hunting. Steenstrup realized this and studied shell-fish gathering among certain Red Indian tribes (*Steenstrup,* 1862).

In mentioning some analogies between prehistoric Danish shell heaps and those found to-day in Ghana, one might start with the structure of the heap. "The Mejlgaard heap is composed of smaller heaps with pits in between; no distinct stratification could be observed" (*Harald Andersen,* 1960). The pits referred to do perhaps only mark a lowering between two small heaps and will be partly filled up when a third heap is later made on top, in front of, or behind the two first ones. The problem is that all heaps at the same level need not be of the same age, and that the lower heaps need not be the oldest. A good oyster bed may well shift, for example 100 m, from one year to the next. Shell-fish may have been gathered at two places at the same time, and so a small heap at a high level at one place may be of the same age as a lower heap nearby. Because of this, prehistoric tools of different ages might easily be mixed up during a normal excavation made by scraping horizontal layers from test squares of 1 or ½ m^2. Sample-washing and similar methods have the same weakness. This possible mixing up makes it difficult to draw conclusions as to when the heap was started and when addition of new shells to it ended, i.e. the length of time taken to produce it. In order to excavate a group of heaps properly, the age of each heap in relation to the others should be determined and the finds from contemporary heaps kept together. It should then be possible to elucidate the stratification and absolute age of the heap by comparison with C^{14}-dated archeological specimens of the same type, C^{14}-dating of shells being difficult and more uncertain. The recent observations in Ghana suggest that "stratigraphic traps" exist.

It has often been assumed that the stone-age oyster gatherers must have lived very near the kitchen midden. However, it is quite possible that they lived in a more sheltered place farther inland and it might be worth looking for settlements farther away from the heap than has been done previously, while considering the possibility that the heaps were merely a place where the catch was prepared.

As regards implements and tools, the rough hand wedges such as those known from the submarine settlements of Stavnsfjord on Samsø and in Roskilde Fjord are of particular interest (fig. 11). They have a broad, rather solid handle (12 cm), thinning evenly out to the more pointed end, and a total length of about 15 cm. It has been suggested (*Therkel Mathiassen,* 1934) that they were used as hand tools for beating, cutting and scraping. Their primitive form resembles that of the palaeolithic hand wedges from Central and Western Europe, and is very rare in mesolithic and neolithic cultures. *Ulrik Møhl,* of the Zoological Museum in Copenhagen, has suggested (personal information) that these hand wedges might have been used to knock oysters loose from stones and from each other. The buyancy of water makes a heavy tool necessary in order to give the blow sufficient force. For this use a finely made tool would not have been necessary, and a chisel-shaped point and a handle would have been sufficient. When the point broke, the tool would probably have been discarded on the spot and a new one made in a few minutes. Consequently, they would never or only seldom be found in the heap itself. The ancient Danish hand wedges might be a combination of the tools applied in Ghana, the tapping stone and the (iron) wedge. This is, of course, only a suggested explanation.

The presence of potsherds of jars with pointed base in the Danish kitchen middens do not exclude the possibility that oysters have simply been boiled on the beach and removed from their shells for later transportation to a village nearby.

The examples mentioned here of possible interpretations of old problems should only be regarded as an attempt to stimulate the imagination in the hope that others will go out and observe as much as possible to supplement studies of materials in drawers and archives. Inspiration comes more readily from seeing things function and from personal experience.

Modern shell-fish gathering in South Ghana

In connection with a study of the effects of the construction of the Volta Dam and the formation of the 800 km² lake behind it, *Romana Lawson* (1963) has described shell-fish gathering in South Ghana, where it has developed into a local industry. On the reach between Targome and Malfie (fig. 1) shell-fish gathering is the main occupation of 1000-2000 women and the secondary occupation of 1000 more. The principal shell-fish beds are in the shallow water,

close to the banks of the river, although some midstream sandbanks may also provide excellent spawning grounds. The remarkably intensive gathering in this area is especially due to favourable sales possibilities in the big market at Akuse, with which there is excellent connection by roads. From here the shell-fish can be transported rapidly and in large quantities for sale in the important towns along the coast, especially Accra.

The gathering commences as early as December and continues until July. The women paddle out to the sandbanks in small canoes and collect the shell-fish, diving for them in water up to 4 m deep. The traditional marriage present from husband to wife is a canoe. The shell-fish are often transplanted from the sandbanks in the middle of the river to small fenced-in "farms" near the river bank, and one woman may possess many farms along the river. The catch is prepared in one of two ways. The unshelled shell-fish are either cooked with peppar to make a soup, or smoked in their shells, shelled and then stored. A woman may earn up to 3000 D.kr. by shell-fish gathering during the reason, and the average is about 1000 D.kr.