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Institute of African Studies, University of Ibadan, Nigeria.

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| <u>CONTENTS</u>  |       | Page |
|--|-------|------|
| Editorial  | ..... | 3    |
| <u>Recent Archaeological Research in the Dhar Tichitt Region of South-Central Mauretania</u><br>by Patrick J. Munson   | ..... | 6    |
| <u>Cultural Remains from Tellem Caves</u><br>by B. J. Bazuin-Sira  | ..... | 14   |
| <u>European Traders on the Gold Coast</u><br>by David Calvocoressi   | ..... | 16   |
| <u>The 'French Battery' at Elmina</u><br>by Colin Flight   | ..... | 20   |
| <u>Reconnaissance in Cameroun</u><br>by Nicholas David   | ..... | 24   |
| <u>The Nok Culture: Excavations at Taruga</u><br>by Bernard Fagg   | ..... | 27   |
| <u>Interim Report of the University of Colorado - Kainji Rescue Archaeology Project 1968</u><br>by David A. Breternitz | ..... | 31   |
| <u>The Genesis of Types: A Logical Model</u><br>by S. G. H. Daniels  | ..... | 43   |
| <u>The Takoradi Radiocarbon Date</u><br>by Colin Flight  | ..... | 48   |

Editorial

In our last number (pp. 63-72) we published a paper on the need for a West African Archaeological Journal and a copy of a letter of invitation to a meeting concerned with promoting it. This meeting took place on 18th May 1968 in the Institute of African Studies, University of Ibadan.

Present: Chairman - Professor Thurstan Shaw, University of Ibadan  
Recorder - G. E. Connah, University of Ibadan  
Professor R. G. Armstrong, University of Ibadan  
D. Calvocoressi, University of Ghana  
Professor M. Crowder, University of Ife  
S. G. H. Daniels, University of Ibadan  
John Harris, University of Ibadan  
R. Nunoo, Ghana National Museum  
K. Oyenuga, University of Ife  
P. Ozanne, University of Ife  
J. Packman, University of Ife  
Professor M. Posnansky, University of Ghana  
D. Simmonds, University of Ibadan

Opening: The Chairman welcomed all those who were attending and thanked them for the trouble they had taken to do so. He read extracts of letters from Henri Hugot, I.F.A.N., Dakar, who was unable to attend but agreed that the matter was urgent, that the journal should be bilingual, and offering his full support; from Mr. Ekpo Eyo, Acting Director, Federal Department of Antiquities, Nigeria (unable to be present because of attendance at a meeting in Moscow) who fully supported the idea of a journal; and from Professor Shinnie, University of Khartoum, who strongly supported the idea of a journal and of its growth out of the Newsletter but did not favour an Association. Apologies for absence were also conveyed from Mr. Brooks, Representative of UNESCO, from Professor H. F. C. Smith of Ahmadu Bello University, Zaria and from Dr. D. Hartle, University of Ibadan (absent in the field).

Agenda: It was decided to use the Chairman's letter, published on pages 69-71 of West African Archaeological Newsletter No. 9 as a framework for discussion.

Archaeological Association: There was considerable discussion on the merits and demerits of forming a West African Archaeological Association, and of linking the production of

a journal to it. The dangers of such a link were illustrated from the experience of Sierra Leone Studies, which had been produced by an Association which then became defunct, while the need for the publication continued. Accordingly, it was decided to drop the idea of linking the production of a West African Archaeological Journal with the formation of an Association.

Finance: Finding £3000 to cover the cost of producing the first two issues was the crux of the matter. It was suggested that this was exactly the kind of thing which one of the Foundations might be asked to support. It was pointed out that a Foundation would be more likely to give its support if it could be stated that a number of Institutions were already committing themselves to give some support. Professor Crowder said he thought that the Institute of African Studies, University of Ife, would be able to offer £600 a year for two years, and Professor Armstrong said that the Institute of African Studies, University of Ibadan, should be able to manage £750 a year for two years; Professor Posnansky thought that the University of Ghana would be able to find £300 over two years.

Editor: Professor Thurstan Shaw was asked to undertake the editorship, and he said he would if Professor Crowder would assist on the business side, and if he could have the help of Mr. Connah and Mr. Ozanne as Assistant Editors. This was agreed.

Editorial Board: The following names were suggested as members to be invited to serve on an Editorial Board as soon as a firm promise of £3000 for the next two years had been received: - M. Henri Hugot, Professor Posnansky, Professor Willett, M. Guy de Beauchêne, Professor Raymond Mauny, Professor Michael Crowder, Mr. R. B. Nunoo, Mr. Ekpo Eyo, Professor Peter Shinnie, M. Blankoff and M. Coppens.

Legal Position: As soon as an Editorial Board had been formed, legal advice should be sought concerning questions of incorporation and the legal ownership of the journal. After this it would be the task of the Editor, Assistant Editors and the Editorial Board to make arrangements for choice of Press, Publishers etc.

Since the above meeting, a firm promise of £600 a year for two years has been received from the University of Ife, and of £250 a year from the University of Ghana over the same period; the Committee of the Institute of African Studies, University of Ibadan, has approved a sum of £750 a year for

two years if this can be found out of savings. Letters have been sent to those proposed for the Editorial Board inviting them to serve on it.

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In Newsletter No. 8 it was announced that with the issue of No. 10 the rubric forbidding quotation for written publication without the original author's consent would be dropped, and it will be observed that this has been done. If in the future any contributor wishes this to apply to his particular article, it can always be so stated.

It will also be noticed that we have dropped the other language summaries, in accordance with the policy agreed for the proposed journal. We should like to take this opportunity of thanking Mr. A. C. Brench, of the Department of Modern Languages, University of Ibadan, for his assistance with the French summaries in the last three issues.

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Dr. Oliver Davies has asked us to announce that the address of the publishers (who are also the retailers) of his The Quaternary in the Coastlands of Guinea has changed and is now:

Jackson Son & Co.,  
98, Holm Street,  
Glasgow C. 2.

RECENT ARCHAEOLOGICAL RESEARCH IN THE DHAR TICHITT  
REGION OF SOUTH-CENTRAL MAURITANIA

by

Patrick J. Munson

Introduction

It has for some time been known that there existed in south-central Mauritania, along the escarpments (dhars) of Tichitt and Oualata and around the dry lake beds which lie at the bases of these escarpments, a great number of Neolithic villages, many of which are quite large and are of rather sophisticated stone-masonry construction. However, primarily because of the general inaccessibility of this desert region, little more than cursory surveys had been made in this area.<sup>2</sup> In February of 1967, under the auspices of the University of Illinois and l'Institut Fondamental d'Afrique Noire, a fairly intensive survey was conducted in a limited portion of this region, namely along the escarpment from the town of Tichitt to a point about ten kilometers east of Akreijit, a distance of some 40 km. From January through March of 1968 I returned to this specific region, under the sponsorship of the National Science Foundation, and carried out a number of limited excavations plus some additional survey work.

Present Physical and Cultural Milieu

The Tichitt region lies at the southern edge of the Sahara Desert. Rainfall presently averages about 100 mm. per year and comes almost entirely in the months of August and September. Ground cover, where present, consists of scattered clumps of coarse grasses (primarily Panicum, Echinochloa and Cenchrus) and occasional Acacia trees. Much of the surface consists of unstable or semi-stable sand and exposed rock.

There is in this region a fairly sheer escarpment of sedimentary rock which rises some 200 m. above the plain to the south. At the base of this escarpment lie a series of presently dry lake beds, and in those areas where they have not been obscured by dune action three fairly well defined beach ridges are present, testifying to various levels of these extinct lakes.

The present population density of this region is quite light and the people are closely tied to the widely scattered

oases where they subsist primarily by pastoralism (camels, sheep, goats) and the growing of dates.

### The Archaeological Sequence

With the exception of a few heavily patinated and eroded Leyallosian flakes which were recovered from the surface of the highest beach, the only prehistoric remains found were Neolithic. It seems possible, on the basis of a combination of artefactual categories, site locations, and architectural styles, to divide the Neolithic occupation into eight units, which I will refer to as phases. No site was found where all of these phases were represented in a single stratigraphic column nor are any radiocarbon determinations yet available.\* However, by combining evidence from beach ridge chronologies, trends revealed in relatively short stratigraphic sequences, and a "logical" seriation of artefactual and architectural styles, these phases can, I believe, be arranged into a reasonable sequence. However, I must stress that analysis of these data and materials has barely been begun; therefore any conclusions drawn herein must be viewed as extremely tentative.

Akreijit Phase: Found scattered over the surfaces of stable dunes in several locations was an assemblage which I have tentatively assigned to the earliest position. Unfortunately none of the sites of this phase had any depth of archaeological deposits. Since all materials were recovered by surface collection, one must exercise extreme caution in assuming artefact associations and in drawing other types of conclusions. However, since a number of artefact types consistently occur together on these sites, and are rarely if ever found on other sites, one might tentatively assign them to a single phase.

These sites produce numerous microliths (primarily crescents but also some triangles, trapezes, backed bladelets and drill bits), small end scrapers, small stemmed projectile points, highly polished axes and gouges, small perforated quartz pebbles, small bi-polar segment d'orange quartz cores, and ground stone bracelets. Milling stones are relatively rare and are of a portable nature. The pottery consists of sand tempered, highly burnished (and often red filmed), dentate stamped or incised bowls.

Khimiya Phase: Sites of this phase are found on the tops of semi-stable dunes immediately behind the second beach ridge. Three sites of this phase were discovered and

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\* See Addendum: Ed.

excavations were conducted at one, Goungou A, located about one kilometer south-southwest of Akreijit. Here were found a number of refuse filled circular pits some 50 to 100 cm. in diameter which penetrated 20 to 50 cm. into the sand. Approximately five per cent of the pottery of this phase is the same as that of the presumably preceding Akreijit Phase; the remaining 95 per cent consists of fairly large, deep, straight sided bowls with fibre or chaff temper and fabric or basket markings over the entire external surface. No microlithic industry is represented at sites of this phase (nor in any of the subsequent phases), but the remainder of the lithic assemblage of the Akreijit Phase persists, differing only in that small portable milling stones become more common and grooved sandstone net-sinkers make their appearance. The excavations revealed tremendous numbers of fish bones as well as remains of turtle, crocodile and aquatic molluscs, attesting to the heavy utilization of the then present lakes. Two radiocarbon samples for this phase have been submitted but the results have not yet been obtained. (See Addendum: Ed.)

Goungou Phase: Sites of the third phase are located directly upon the second beach. Three such sites were found and two were tested. Goungou B lies approximately one kilometer south of Akreijit and excavations here revealed rich midden deposits to a depth of 130 cm. The site of Tichitt NE is located one kilometer northeast of Tichitt and midden deposits are about 30 cm. deep. Approximately 75 per cent of the ceramics of this phase are also fabric marked but differ from those of the Khimiya Phase in that there is a smoothed band two to six centimeters in width at the rim. The remaining 25 per cent are globular bowls with cord or fabric marked surfaces and a band of neat diagonal cord impressions below the lip. The lithic industry is fairly comparable to the Khimiya Phase except that the axes are more poorly executed; only the bit is normally ground with the pole retaining the unaltered chipped surface. Aquatic fauna are still well represented. Two radiocarbon samples have been submitted. (See Addendum: Ed.)

N'Khall Phase: Two sites of the N'Khall Phase were found and both are located on the third (lowest) beach. The N'Khall Site, located three kilometers south of Tichitt, was tested and midden deposits were found to extend to at least 80 cm. below surface. The fabric marked smoothed rim pottery decreases to 25 per cent, diagonal cord impressed bowls increase to 50 per cent, and jars with extruded lips and incised shoulders make their appearance. No net-sinkers were found, and remains of aquatic fauna are rare.



Naghez Phase: Sites of the fifth phase are also located on the lowest beach, but they represent a major deviation from sites of the preceding phases; the sites are of stone-masonry construction and are very large. The village plan is of conjoined compounds, each of which is 20 to 40 m. in diameter and consists of stone-masonry walls one to one and one-half meters high. Within each compound are found one to three houses which normally consist of six slender dressed stones upended in a rectangular pattern. Three sites of this phase were found. The largest, Naghez, located one kilometer southeast of Akreijit, is 1200 meters long and 300 meters wide. At this site a small walled-in rockshelter was totally excavated and an open midden deposit some 50 cm. deep was tested. In addition to ceramics, which differ only in percentages of types (fabric marked smoothed rim decreases to 5 per cent, diagonal cord impressed increases to 75 per cent), the major artefactual difference is the appearance of large numbers of large, non-portable milling stones. Remains of aquatic fauna are very rare whereas large mammal bones are quite common. Two radiocarbon samples are being run for this phase. (See Addendum: Ed.)

Chebka Phase: Sites of the Chebka Phase compare well in size and plan with sites of the Naghez Phase. They differ however in that they are located at the rim of the sheer escarpment some 100 to 200 meters above the lake beds in easily defensible positions and they are heavily fortified; a stone wall two meters high and one meter thick encircles each village and numerous masonry "pill-boxes" line each approach to the village. In addition, many sites have some type of reservoir, normally a low dam across a broad shallow gully, within the confines of the site. Eight sites of this phase were discovered within the 40 km. survey area and excavations were carried out at two. At the site of Seyyid Quinquil, located four kilometers east of Akreijit, a 40 cm. deep open midden deposit was tested, and at Le Baidla I, located eight kilometers northeast of Akreijit, two small walled-in rockshelters were excavated. Artefactually the Chebka Phase differs little from the Naghez Phase except in percentages of pottery types. In addition to site locations and the presence of extensive fortifications, however, it does differ in that there are no evidences of aquatic fauna (suggesting perhaps that the lakes were totally gone by this period) and by the appearance of large numbers of engravings of cattle (often with udders depicted) on rock surfaces within the confines of the sites. Two radiocarbon samples have been submitted for this phase. (See Addendum: Ed.)

Arriane Phase: Sites of the Arriane Phase are also usually located at the rim of the escarpment but they are not in easily defensible positions nor are they fortified. Furthermore, the sites are much smaller and much less compact. Seventeen sites of this phase are known within the survey area, and a small walled-in rockshelter was excavated at the site of Niemilane IV, located 13 km. northwest of Akreijit. The lithic assemblage shows little difference from the preceding three phases, but most of the ceramic types which were present in the preceding Chebka Phase decrease markedly in popularity whereas three new varieties appear: a globular bodied jar with an out-flaring rim and cord-wrapped stick stamped patterns or a band of wavy combed incisions on the shoulder and neck, and a low necked jar with a wide band of straight, horizontal combed incisions at the neck.

Akjinjeir Phase: This terminal Neolithic phase departs markedly from the previous phases. The ten sites of the Akjinjeir Phase are quite small, are extremely well-hidden in very inaccessible positions among the rocks at the top of the escarpment, and are well fortified. The level of architectural workmanship is relatively low and the ceramics, although technologically well made, are unaesthetic and consist of a very limited number of varieties; a high necked undecorated jar and a small cord marked bowl comprise over 90 per cent of the total ceramic assemblage. In addition, very few lithic artefacts, other than massive milling stones, are present. Small walled-in rockshelters were excavated at two sites of this "degenerate" phase, Bledd Initi and Taidart II, located eight and nine kilometers respectively east of Tichitt. Radiocarbon samples have been submitted for each.

### Subsistence

The identification and analysis of the various faunal and floral remains which were recovered are not yet completed but several general and/or tentative statements might be made in regard to subsistence activities. Sites of phases 2 through 5 (Khimiya, Goungou, N'Khall, Naghez) are located on the beaches of the extinct lakes and excavations at these sites revealed remains of such aquatic fauna as fish, turtle, crocodile and freshwater molluscs. These remains were particularly numerous at sites of the Khimiya and Goungou Phases and it is noteworthy that at sites of these phases grooved cylindrical artefacts of sandstone, which have been interpreted as net-sinkers, are very numerous. In addition to the aquatic remains a very preliminary examination of the mammalian bones has indicated the presence of a limited number

of bones of a fairly small variety of cattle. The final word on these remains is now anxiously awaited. In the later phases, where sites were located at the rim of the escarpment, there is a total absence of aquatic fauna, whereas large mammal bones become more common. Many of these seem to be remains of various antelope and gazelle species but the presence of some cattle bones, plus the abundant rock engravings of cattle and perhaps the presence of compounds or enclosures within the sites, suggests perhaps an increasing orientation toward the raising of cattle.

It has also been discovered that the ceramics of all the phases, with the exception of the earliest Akreijit Phase, bear large numbers of very clear grain impressions. Casts have been made of a number of these and the casts have been briefly examined by a botanist who identified among them grains of the genera Chloris, Cenchrus, Panicum, Echinochloa, and Brachiaria. Species of the last four genera are presently collected as famine-foods in the general area and species of the last three genera are or have been minor African cultigens. Taken by themselves, at least at this level of analysis, these data are not conclusive, but taken in conjunction with the implications of numerous large milling stones, the apparently high prehistoric population density, and the evidence of sedentary life, there would seem to be sufficient evidence to suggest that agriculture as well as pastoralism might have been practised during the Neolithic occupation of this region.

#### Notes

1. The term "Neolithic" is used here in what I believe is its original definition; i.e. the presence of ground stone tools and pottery. Food production is not a necessary criterion in this definition.
2. P. Laforge and R. Mauny, "Contribution à la préhistoire de la région de Tichitt," Bulletin de l'Institut Française d'Afrique Noire, I, No. 4 (1939), pp. 691-696.

R. Mauny, "~~Villages néolithiques de la falaise (dhar)~~ Tichitt-Oualata," Notes Africaines, No. 50 (1950), pp. 35-43.

ADDENDUM: RADIOCARBON DATES

Subsequent to submitting a summary of the results of archaeological investigations in the Dhar Tichitt region of south-central Mauritania the results of ten radiocarbon age determinations have become available. Six of these samples were analyzed by the laboratories of Isotopes, Inc. and four were by Geochron Laboratories, Inc. The results from the two laboratories are in fair agreement with each other (with one exception) and the dates essentially support the chronology which was suggested by the archaeological interpretations. From latest to earliest, these dates are:

| <u>PHASE</u> | <u>SITE</u>       | <u>AGE B.P.</u> | <u>NUMBER</u> | <u>DATE B.C.</u> |
|--------------|-------------------|-----------------|---------------|------------------|
| 8. Akjinjeir | Taidart II        | 2330 - 105      | (I-3566)      | 380 B.C.         |
|              | Bledd Initi       | 2600 - 110      | (GX-1326)     | 650 B.C.         |
| 6. Chebka    | Le Baidla I       | 2780 - 140      | (GX-1325)     | 830 B.C.         |
|              | Seyyid Ouinquil   | 3100 - 105      | (I-3565)      | 1150 B.C.        |
| 5. Naghez    | Naghez            | 2700 - 115      | (GX-1324)     | 750 B.C.*        |
|              | Naghez            | 3205 - 105      | (I-3564)      | 1255 B.C.        |
| 3. Goungou   | Goungou B, top    | 2950 - 100      | (I-3563)      | 1000 B.C.        |
|              | Goungou B, bottom | 3190 - 110      | (I-3562)      | 1240 B.C.        |
| 2. Khimiya   | Goungou A         | 3205 - 95       | (GX-1323)     | 1255 B.C.        |
|              | Goungou A         | 3350 - 110      | (I-3561)      | 1400 B.C.        |

Although the dates for the architectural phases came out much as was expected, this being especially true with the terminal phase (Number 8, Akjinjeir) which was suspected of being contemporary with the initial "Libyco-Berber" invasion of the region, the dates for the earlier, non-architectural, lacustrine-oriented phases (Kхимиya, Goungou) are surprisingly late; it was anticipated that the Khimiya Phase would be at least 1000 years earlier. However, since the dates for these earlier phases cluster so nicely and, at least taken by themselves, fall into "correct" chronological order, and since a

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\* From the archaeological data this date should have been roughly contemporary with I-3564 (1255 B.C.) and earlier than GX-1325 (830 B.C.) and I-3565 (1150 B.C.). Since it is not I suspect that it is in error.

$C^{13}/C^{12}$  isotopic fractionation analysis run on one of the samples has indicated that their "true" age would be at most no more than 50-100 years earlier, there seems to be little reason to doubt these results. But, as a safeguard, an additional determination is planned on bone from Goungou A and perhaps an additional  $C^{13}/C^{12}$  isotopic fractionation will be run.

One problem that does arise, assuming that these dates are essentially correct, is that the dates for the Goungou Phase (phase number 3 in the original scheme) seem to indicate that this phase (as well as the presumably following N'Khall Phase - phase number 4) are more or less contemporary with the Naghez Phase (phase number 5). In view of these results it might be at least suggested, in spite of the archaeological evidence seemingly to the contrary, that these three phases are indeed essentially contemporary, or, perhaps more reasonably, that the Goungou Phase is earlier than the N'Khall Phase but that sites of both these "phases" simply represent some type of functionally specialized encampments of peoples who at other times of the year resided in the large architectural sites of the type that have been assigned to the Naghez Phase. However, for this to be a satisfactory explanation one must assume that only certain kinds of ceramic vessels (rather than the total range found at the architectural sites) were utilized at these open sites, and that some different types of lithic artefacts were employed. Assuming that these open sites did have specialized economic functions this explanation might not be too unreasonable.

CULTURAL REMAINS FROM TELLEM CAVES NEAR PEGUE  
(FALAISE DE BANDIAGARA) MALI, WEST AFRICA.

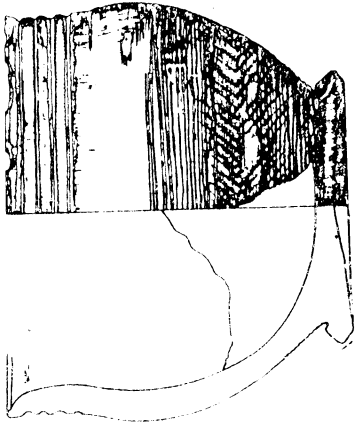
by

B. J. Bazuin-Sira

Geomorphologically central Mali is characterized by the well-known "escarpment of Bandiagara", extending in a S.W. - N.E. direction. Most of the people of the Dogon tribe live in this area. This particular high cliff is honey-combed by many natural caves, part of which are called "Tellem caves" by the Dogon. The latter deny any relationship to this mysterious population. During the early spring of 1964, 1965 and 1966 anthropological studies have been made in this region by a Dutch team (Institute of Human Biology, State University of Utrecht, Netherlands). Human Biological observations, including the study of abundant skeletal remains, were made in order to unravel the relationship between the group represented by the skeletal remains recovered from the "Tellem caves" on the one hand and Dogon and Kurumba (the presumed descendants of the Tellem) on the other hand. Details of these investigations have been reported elsewhere (e.g. Huizinga, 1967, 1968); it can be concluded that the Dogon, Tellem and Kurumba belong to different populations.

The analysis of the remains (physical as well as material) present in many of the Tellem caves (excavated under the direction of Mr. H. Haan) led to the conclusion that the caves appear to have had different functions. Some have buildings which contain skeletons and material remains such as bows and wooden head-rests, others had been used as an ossuary, with skeletons covered or wrapped in textiles and also accompanied by bows and head-rests.

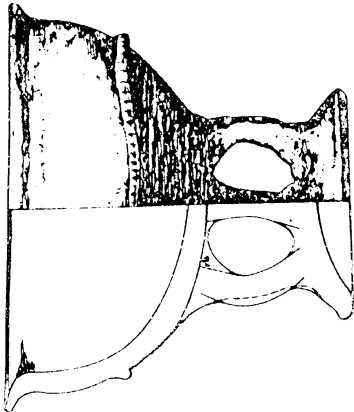
One cave (cave D) in the wall of a particular canyon near Pégué (for details see Huizinga et al., 1967) called for special attention for it contained only pottery and some iron objects (bracelets and arrowheads) in a deposit of about 30 cm. thickness. The pots from this cave were in general small (Fig. 1), with a form and decoration completely different from those of the high cliff caves (Fig. 2). Pots from high cliff caves tend to be big and have broad outstanding rims. In addition they were made on a revolving support in contrast to the pots of cave D which do not show a sign of this technique. Besides the difference in form, decoration, modelling and manufacture, there is a difference in fire temperature; the softer ware (especially the pots with 3 or 4 bowed legs



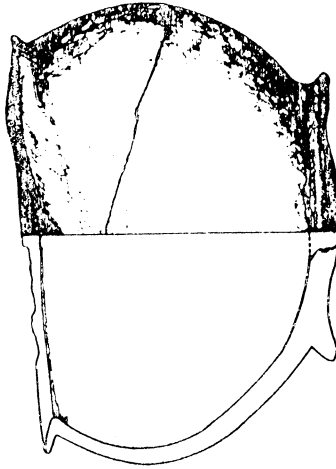
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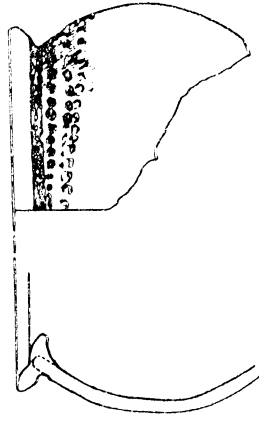
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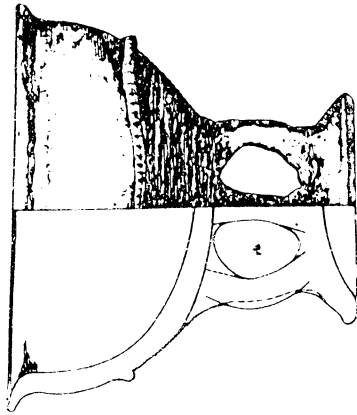
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716 1.

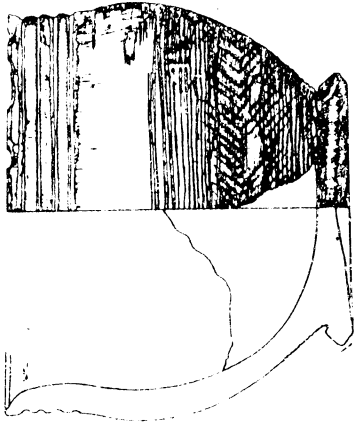
Different pots from cave D; canyon near  
Pégué in the escarpment of Bandiagara, Mali.



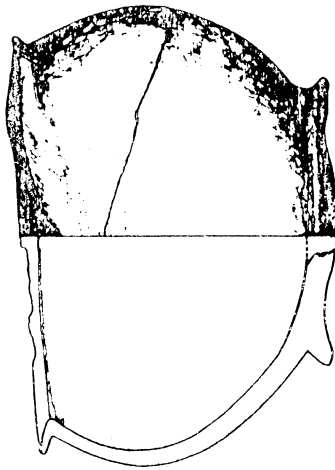
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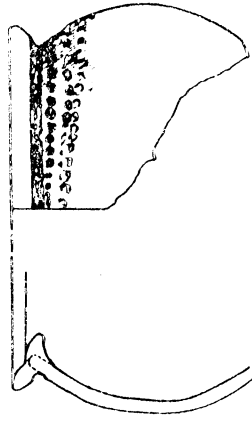
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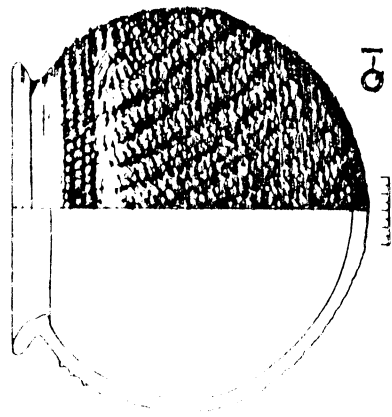


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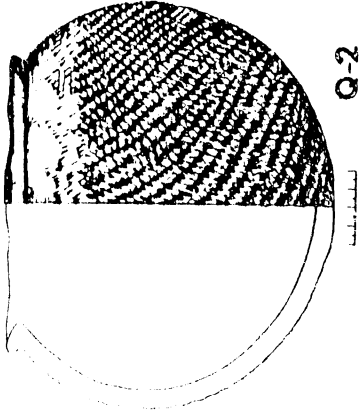
Fig 1.

Different pots from cave D; canyon near  
Pégú in the escarpment of Bandiagara, Mali.

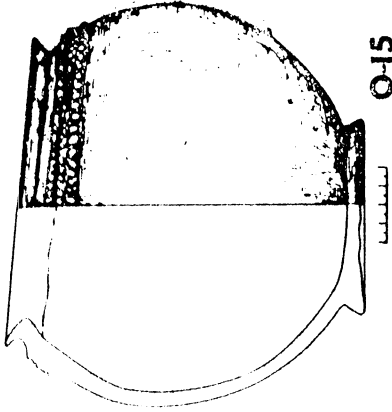




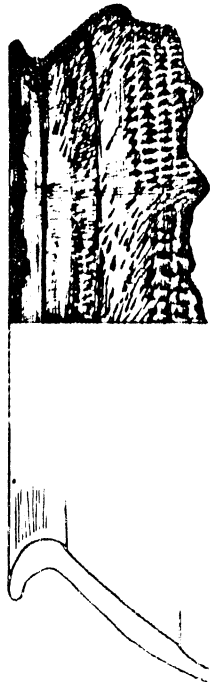
Q-1



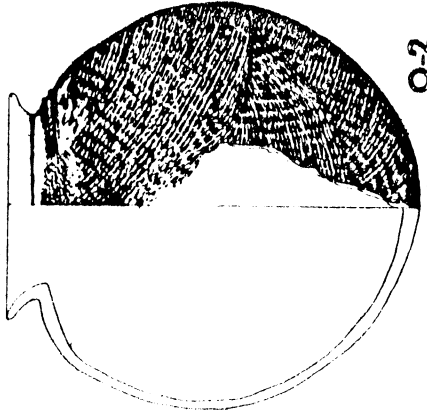
Q-2



O-15



P-506



O-2

Fig 2.

Different pots from cave O, P and Q near  
Pégué in the escarpment of Bandiagara, Mali.

from cave D) are roughly estimated as having a firing temperature of 750-800 °C and the harder ware from the high cliff caves are estimated at 900-950 °C.

The making is also different, the pots from cave D show that the bottom and underpart of the pot were made of one piece of clay, then the upper part and rim were built up by adding 2 or 3 rolls of clay. Such a technique is not recognisable in pots from the high cliff. Probably they were made in or around a mould, for these pots are more regular in shape and thickness, and no rolls are to be felt or seen on the inside, except the one used for adding the outstanding rim. Decoration was probably done with a basket or mat and in some cases for the upper part of the pot by rolling a single string over the wet clay. The decoration of the pots of cave D consists of grooves and barakalé impressions. This last technique consists of a piece of iron plaited in a special way and still used nowadays in several populations in Africa; the same result is possible with a carved piece of wood. Textile impressions were also used but of a finer kind than the mat ones of the high cliff caves.

The place of this peculiar pottery among the other finds is by no means clear. It is not, as are the ceramics from the high cliff caves, associated with skeletons which could be dated (Huizinga et al, 1967) and which belong to the population defined as Tellem.

Is the difference in ceramics due to difference in function (ceremonial pots in contrast to kitchen pots), or in the population who made them (in which case cave D should not be Tellem), and/or in time?

Further studies of this problem have been done in the field of chemical and physical analysis. It is hoped to publish the results soon.

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EUROPEAN TRADERS ON THE GOLD COAST

by

David Calvocoressi

During October 1967 excavations were carried out by the Department of Archaeology, University of Ghana, at a mound locally called Abensim at the village of Bantama about 1 mile west of Elmina (5° 05'N 1° 21'W). The excavation was financed by the Ghana Museum and Monuments Board.

There has been a casual interest in this particular site for some time as it has been linked traditionally with an early landing and settlement of French merchants from Dieppe and Rouen in the late 14th and early 15th centuries, well before the first Portuguese arrived on the scene.<sup>1</sup> One of the purposes of the excavation was to try to prove or disprove this theory. The arguments for and against it are not relevant here. Suffice it to say that no trace of any French occupation was found at Abensim.

The more orthodox interpretation of the history of European settlement at Elmina is that the Portuguese built Elmina Castle in 1482 and had a trade monopoly for about 100 years. By the end of the 16th century this monopoly was being strongly challenged, in particular by the Dutch, who after a number of abortive attempts captured Elmina in August 1637. Five years later the Portuguese had left the Gold Coast. Elmina Castle and the immediately surrounding area was controlled by the Dutch until 1872 when they sold their castles and trading rights in the Gold Coast to the British.

The history of the building at Abensim is closely tied to that of Elmina itself. Following a probably 16th century local occupation a small square building was constructed out of locally quarried stone, apparently rather hurriedly since there were no foundation courses to the main wall. The dating and function of this building will be discussed below. Shortly after its construction it seems to have been abandoned, as is evidenced by 7 feet of wind-blown beach sand. Subsequently it was re-occupied for some years, only to be abandoned again in the 18th century. In 1807 the site was used as a defensive post against the invading Ashanti and a number of cannon were brought from Elmina to assist in this.<sup>2</sup> Since then it has sanded over completely.

The dates of the original construction and the later re-occupation can in general terms be put in the 17th century. The actual date of construction can be determined fairly closely. Dating of archaeological sites of this period in Ghana depends almost entirely on European imported goods and historical references. At the level of the original construction there were very few imports. Three undiagnostic fragments of tobacco pipe stems were recovered from just below the foot of the wall. There were no locally made tobacco pipes, which came into production on the coast about 1640.<sup>3</sup> The earliest occurrence of tobacco pipes, dates back to the beginning of the 17th century. On archaeological evidence it can only be said therefore that the building was constructed after the beginning of the 17th century.

The Dutch plan of Elmina of 1637 shows various buildings in this general area.<sup>4</sup> A battery or small fort towards the west end of the town on the river bank and a rectangular building in the middle of the peninsula between the river and the sea, described as a gateway, can immediately be ruled out since the location of neither fits Abensim mound which is within 30 yards of the sea. However various sources<sup>5</sup> agree that a wall ran across the peninsula at the west end of the town, one section of which passed behind a group of large pits which are still visible. At the seaward end of this wall was a battery. The earliest mention of the wall is on a Portuguese map of 1620 and although it is omitted from the Dutch plan of 1637 this is probably an error since it reappears in the Prinz Eugen map of 1665 and is mentioned by Barbot in 1682. We found no trace of this wall: but the building excavated at Abensim mound fits well as the battery shown at its seaward end. Possibly this is the battery mentioned in connection with the abortive Dutch attack of 1625.

If this is so, it would date the construction of the Abensim battery to some time in the first quarter of the 16th century, its builders being the Portuguese. The period of abandonment of the site can hardly have started before the Dutch capture of Elmina. The Portuguese could not afford to treat the Dutch threat so lightly as to desert their defences. The abandonment must have begun shortly after 1637 when the Dutch gained control of the area.

The date of the re-occupation, presumably by the Dutch, can be fixed by European imports at the site - in general terms to the second half of the 17th century and lasting perhaps into the 18th century. Closer dating evidence should be available when the imported items - tobacco pipes, pottery and

beads - have been identified more exactly. This date is supported by the local pottery, some of which can be paralleled at the 17th/18th century site of Asebu, about 10 miles north of Cape Coast.<sup>6</sup>

The reason for the re-occupation was probably local trade rivalries. The second half of the 17th century was the period of fiercest competition between the Dutch and British; although open war did not break out on the Gold Coast until 1665, unofficial hostilities date back to at least 1650. In the 1670's the French were trying to put Colbert's colonial policy into effect and in doing so became a threat to the Dutch. But whatever the threat was, it had apparently passed by the beginning of the 18th century when the Abensim battery was again deserted, this time, apart from a brief episode in 1807, for good.

The construction of the building seems to have been a hurried job and rather a careless one when one considers the absence of any foundations to the main wall. It was a small building, being no more than about 30 feet square. So far no wall has been cleared along its whole length and this measurement is based on the size and contours of the mound. Part of the north wall was exposed. The main wall stands to a height of 7 feet though at one time it was certainly higher; and it was 5 feet thick. Outside this about 1 foot below the top of the wall as it now stands was a paved terrace area, 3 feet across, retained by another wall 9 inches thick. This latter wall was plastered on its outer face. The stone used in the construction was obtained locally, probably from the area immediately to the east and north east where there are several small quarries, described variously as water cisterns or defensive obstacles. The stone was roughly shaped and the blocks cemented in place with mortar.

A preliminary study of the European imported goods suggests a Dutch or German origin in most cases, but too few of these have so far been identified for any hard and fast conclusions to be drawn. Almost all of them were found in the later occupation levels and a date in the second half of the 17th century is indicated. Many of the tobacco pipes have a maker's mark stamped on a flat-based spur below the bowl, none of which appear in lists of British tobacco pipes. Certain features such as a milled rim to the top of the bowl and the fact that the top of the bowl is not parallel to the stem imply a date before 1700.<sup>8</sup>

The sequence at Abensim is, then, reasonably straightforward: the original construction of a small defensive post on the west town wall of Elmina by the Portuguese, probably shortly before 1620, but later abandoned at the time of the Dutch capture of the area in 1637. It was later re-occupied by the Dutch in the second half of the 17th century until early in the 18th century by when it seems to have outlived its usefulness.

Apart from any other considerations, the site provides a good example of the main dating methods available to the archaeologist working in this period - European imports and historical documents. In this sense it is relatively well endowed, Elmina being one of the better documented areas in the country.

Further work will be carried out in the area next year.

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1. E. L. R. Meyerowitz, Akan Traditions of Origin (Faber 1952) pp. 70-72.
2. ibid. p. 71, note 2.
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7. W. E. F. Ward, A History of Ghana (Allen and Unwin 1958), pp. 81-103.
8. A. Oswald, "The archaeology and economic history of English clay tobacco pipes" Journal of the British Archaeological Association, Vol. XXIII, 1960.

THE 'FRENCH BATTERY' AT ELMINA

by

Colin Flight

The Castle of St. George at Elmina was founded by the Portuguese in 1482, 'the first stone building in the region of the Ethiopias of Guinea since the creation of the world'.<sup>1</sup> The site was carefully chosen, a rocky headland at the end of a narrow, low-lying peninsula, with a sheltered sandy bay to the east (fig. 1, inset).

Though there is almost nothing now to be seen of the original Portuguese work, Professor Lawrence was able to piece together on paper much of the plan and some parts of the elevation.<sup>2</sup> The loss of the original manuscript of Pacheco's Esmeraldo de Situ Orbis has deprived us of 'a painting from sight of the castle' by one who had apparently been on the expedition which built it.<sup>3</sup> No reliable plans or views are extant earlier than about 1600, but the condition of the Castle in 1637, when it was surrendered to the Dutch, can be reconstructed in some detail (fig. 1). Particularly useful are a view from the east, well observed and well executed, drawn by a Dutch artist early in the year, and an outline plan, surveyed in a hurry but tolerably accurate, made by one Commersteyn immediately after the Dutch had taken possession (Lawrence's plate 7a and fig. 8).

The rectangular block of buildings ranged around the inner court was part of the original castle; so was the great courtyard to the south-east. The bastions are later additions, dating from the second half of the sixteenth century; and later still the west bastion was enlarged, probably not long before 1637. Also relatively recent was the church, built in 1598. The open space between the rectangular block and the river was surrounded only by a mud wall; at one corner was a little graveyard, at the other the gun-platform which afterwards came to be called the 'French Battery'. The castle was defended on the landward side by two rock-cut ditches. Part of the outer ditch had been walled off and was used as a reservoir. Beyond lay the 'city' of Elmina, defended in its turn by a wall which ran across the peninsula from the lagoon to the sea, roughly half a mile west of the castle.<sup>4</sup>

In or soon after 1637, when the Dutch were making good the damage their guns had done to the castle, they are said to have found a damaged inscription in the 'French Battery'.

It was, as they deciphered it, a date in Arabic numerals beginning with a 1 and a 3. Because of the belief which had already gained some currency that French traders discovered the Gold Coast before the Portuguese, the Dutch decided that the battery had been built originally by the French, and gave it the name it still has. The inscription is now lost, and counts for nothing against the weight of evidence for Portuguese priority. One possibility is that the Dutch mistook a damaged 5 for a 3; or perhaps they were looking at it upside down and the figure was really an 8.

The 'French Battery' has not changed perceptibly in shape or size since 1637. It forms an irregular polygonal salient at the north corner of the service yard, close by the mouth of the river. Two of the faces lie within the line of the wall, and three outside. It is filled solid, presumably with earth.<sup>5</sup>

Lawrence regarded it simply as a gun-platform of late Portuguese date. 'The shape of the battery and the inconsiderable height' seemed to him to 'prove that it cannot be older than the last quarter of the sixteenth century'.<sup>6</sup> This interpretation is not altogether convincing. It would take an exceptionally incompetent engineer to lay out a battery with every face wrongly aligned.

There is in fact some reason to think that the 'French Battery' has had a more complicated history than Lawrence realized. A certain regularity which is to be seen in the length and orientation of the outer faces, CDEA, but which cannot be detected in the lay-out of the inner faces, suggests that the existing structure is not all of one build (fig. 2). Two of the external faces, CD and DE, are of almost equal length, a little over 42 feet; EA is shorter, but could for the sake of argument have been as long as the others originally. The angle CDE measures about  $113^\circ$ , the angle DEA is larger, about  $137^\circ$ . Producing AE and CD to meet at a point X, it is easy enough to prove that triangle DEX is very nearly isosceles, with DE approximately equal to EX. What is more, simple trigonometry will show that DX is almost exactly three-quarters the length of DE, the inference being that both were intended as multiples of the same standard unit of length.<sup>8</sup> This was presumably the Portuguese fathom of 7.21 feet.

It seems hard to believe that this appearance of regularity in the lay-out of CDEA can be due just to coincidence. If it is meaningful, then the inner faces of the battery, ABC, which do not obey the same rules, must be secondary, and not part of the original plan.



Assuming that the 'French Battery' as first built was meant to be symmetrical, its plan can be reconstructed. Given that the angles at D and E are unequal, only two axes of symmetry are possible: one through E parallel to DC, the other perpendicular to the first bisecting DC. The result is a figure with six equal sides, elongated on the north-west to south-east axis - a distorted hexagon.

In practical terms, the field-geometry involved in laying out this figure was apparently as follows:-

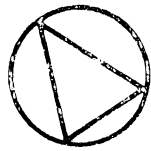
- (i) fix a base-line XY 15 fathoms long;
- (ii) mark off points C and D on the base-line  $4\frac{1}{2}$  fathoms from either end;
- (iii) fix point E 6 fathoms equidistant from D and X;
- (iv) project a line from X through E to F so that EF is 6 fathoms long;
- (v) in the same way fix H and G;
- (vi) check that FG is 6 fathoms long, and that CE = DH = EG = FH.

The angles which ought to result from this procedure work out as  $136^\circ$  at E and  $112^\circ$  at D.<sup>9</sup> Thus the observed error is of  $1^\circ$  in either case, no more than might be expected.

It is suggested that the hexagonal structure was built as a reservoir, receiving rain-water from the roofs of the castle and dispensing it to ships' boats. No other interpretation seems to account adequately for its shape and size, and for its position relative to the castle and the mouth of the river. It cannot in that case be earlier than the castle itself; on the other hand in the abnormal plan of the North Bastion there may be seen a hint that the hexagonal structure was already in existence when the bastion was built. Except within these broad limits the hexagonal structure cannot be dated. By 1637 it had been reduced to about half its original size, packed with earth, and put to use as a gun-platform.

The problem of the 'French Battery' is not after all of much importance. A little excavation in and around it would no doubt provide the answer; but it would hardly be worth while unless it could be undertaken as part of a long-term project of research on the Castle, and also on the area of the 'city', abandoned in 1873 to be rebuilt later on the other side of the river. There is an opportunity here for studying the process of cultural interaction over a period of five

# ELMINA IN 1637



based on  
Commersteyn's plan

0 100 FEET

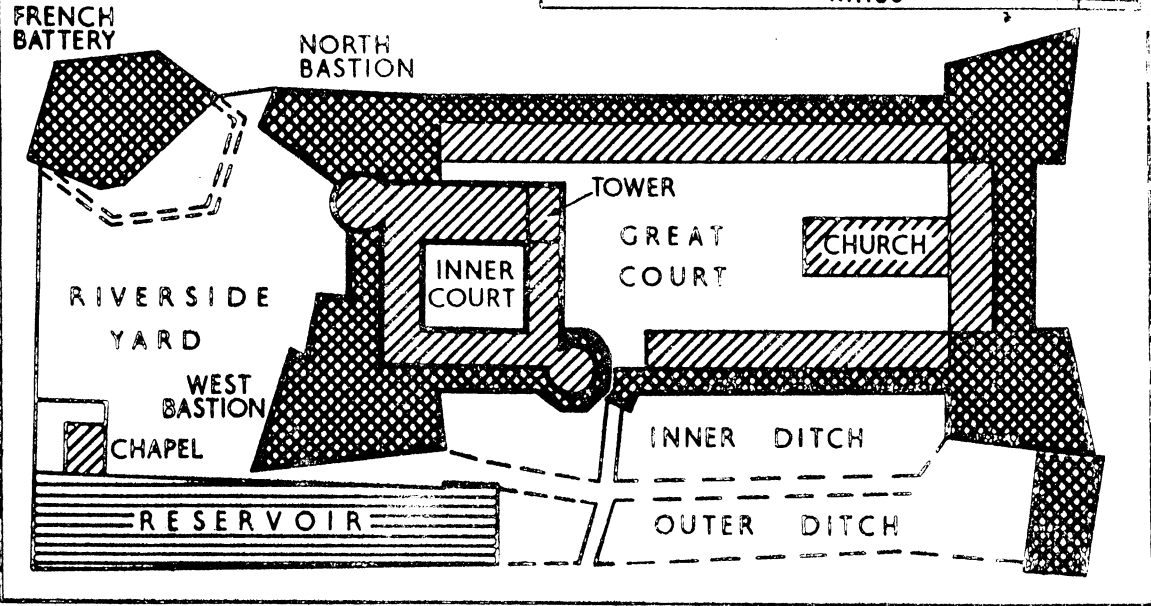
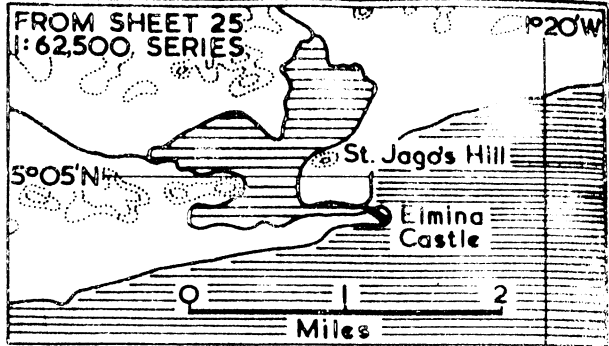


Fig. 1

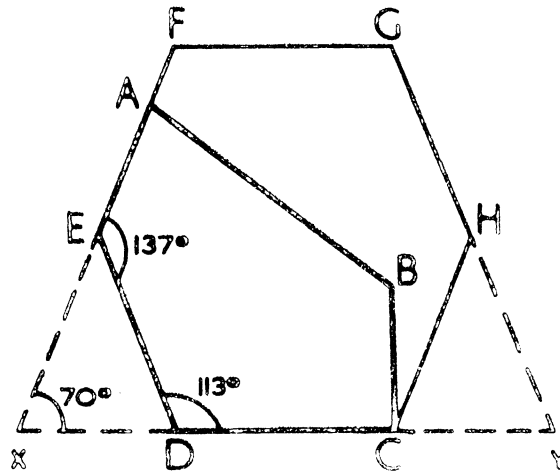


Fig. 2

hundred years. Equally important, though perhaps less sure of success, is the chance of establishing at Elmina a chronological framework relevant to work further inland on the development of the early Akan states. For the period before the appearance of locally made tobacco-pipes in the mid-seventeenth century, the problem of dating is sure to be acute, except where European imports occur; and it is only at Elmina that imports are likely to be found in quantity, and in contexts which can be dated independently.

Notes:

1. Duarte Pacheco Pereira, Esmeraldo de Situ Orbis (Hakluyt ed.), 120.
2. A. W. Lawrence, Trade Castles and Forts of West Africa (1963), 103-15.
3. Pacheco, op. cit., 121.
4. Lawrence, op. cit., 116-30.
5. Lawrence, op. cit., 126.
6. ibid.
7. CD = 42' 7", DE = 42' 2". I am obliged to Professor Merrick Posnansky for going out of his way to make these measurements for me. The scale on Lawrence's fig. 11 is incorrect.
8. In triangle DEX,  $\hat{D} = 67^\circ$ ,  $\hat{E} = 43^\circ$ ,  $\hat{X} = 70^\circ$   
 $\frac{EX}{DE} = \frac{\sin 67^\circ}{\sin 70^\circ} = 0.98$ ,  $\frac{DX}{DE} = \frac{\sin 43^\circ}{\sin 70^\circ} = 0.73$ ,  
therefore EX: XD: DE = 4: 3: 4 approximately.
9.  $\cos \hat{X} = \frac{\frac{1}{2}DX}{EX} = \frac{3}{8}$ , therefore  $\hat{X} = 68^\circ$ ,  
 $\hat{CDE} = 180^\circ - 68^\circ = 112^\circ$ ,  $\hat{DEF} = 2 \times 68^\circ = 136^\circ$

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Fig. 1. (Opposite) Outline plan of Elmina in 1637, based on Commersteyn's plan and not guaranteed accurate in every detail.

Fig. 2. (Opposite) Geometry of the 'French Battery'.

RECONNAISSANCE IN CAMEROUN

by

Nicholas C. David

In 1967, I made a brief archaeological reconnaissance in Cameroun, guided by M. Eldridge Mohamadou of the Federal Linguistic and Cultural Centre. Our aim was to find stratified sites, relevant to the problems of the development of food production and of the introduction of iron technology.

We concentrated our efforts on the basin of the Upper Benue. East and west of Garoua, there are Quaternary alluvial deposits 10 km. and more in width. The present Benue flood plain is here about 4 km. wide. Minor roads were already becoming impassable by mid-July, and we were forced to concentrate on the valleys of the Benue and Mayo Kébi, to the east of Garoua. Along 35 km. of river bank, we identified no less than ten mounds, varying in size from BÉ, 1 km. long, 500 m. wide and about 9 m. in height, to small mounds, 100 m. in maximum dimension. Many others are reported to exist in the Bibémi area further up the Mayo Kébi, and they very probably also occur downstream of Garoua. It is not known how far they extend up the Benue, though there are none near Rey Bouba, 100 km. SE of the Benue - Mayo Kébi confluence. The mounds are liberally scattered with potsherds; some are under millet and cotton cultivation, while others are still occupied. We decided to test one mound, in order to determine whether it was artificial. The site chosen, Nassarao I, is one of a cluster of five mounds in the Benue flood plain, located 8 km. northeast of Garoua, to the south of the main Garoua - Maroua road. It is shaped like a saddle, measuring about 220 m. E-W, 60 m. N-S, and rises some 5 m. above the level of the plain. A small test pit, dug at the highest point of the mound, revealed 3 m. of horizontally stratified floors and occupation debris, resting upon a base of sterile, compacted, sandy clay, perhaps a fragment of an old levée, upon which the first inhabitants established themselves above the level of the floods. Excavation was by arbitrary (20 cm.) units except where there were well defined floors. The levels were labelled 1-21 from top to bottom. Structural features included three pavements of potsherds (levels 2, 4 and 7) laid flat, not on end as at Daima (Connah, 1967), two fragmentary floors of small chert concretions (level 5), and many floors of beaten earth from levels 8 - 17. There was a pit and part of a hearth with a raised clay surround. Faunal remains were well preserved and included freshwater mussel.

and oyster shells, large snails, tortoise, fish vertebrae, and mammal bones, as yet unidentified. Iron objects were recovered from several levels down to 17; their absence below this is probably not significant. Beads and other fragments are now being restored. There are no axes, adzes or hoes, but ground stone appears in the form of a fragment of an oval lava quern, lava grindstones, crescentic in shape in the upper levels and narrower below, and subspherical, multi-faceted rubbers, of basalt and quartz which appear from top to bottom of the site. Flakes of quartz and rare flaked tools, including a pebble pick and a steep scraper occur in and below level 3.

Pottery is abundant down to level 14, less frequent below. Preliminary study suggests no breaks in the sequence. The pottery is tempered with coarse grit, and is a well fired light buff ware with matt surfaces, varying in thickness from about 2 cm. to 3 mm. Local variations in firing, or smothering at a late stage of the firing, may produce blackening, and some pieces were fired under reducing conditions. Many sherds are slipped with colours ranging from pink to dark red-brown; a considerable number of these are burnished, especially on or near the rim. Forms include the common "storage or cooking" pot with everted rim and rounded base, and bowls with simple or incurved rims, the forms of the lip showing greater variation in the upper levels. Both classes cover a wide size range. There are also shallow platters, up to 40 cm. in estimated maximum diameter, and occasional bottles. Applied features include vertical handles, tabs and lugs, and disc bases; surface finds suggest that footed vessels were also made. Large pots may have a raised cordon pinched up around the shoulder, sometimes decorated by impression or punctation. There is a wide variety of decorative motifs, of which cord-marking is the most common. It is usually applied by roulette in bands around the rim, neck or shoulder of the pot, the bands sometimes being delimited by shallow grooves. Other rouletted impressions include a fine chevron pattern, which appears only above level 10. There are many punctate designs, and a little incision. Many sherds are decorated along the top of the rim with impressions, punctations or a shallow groove. Decoration is often encrusted with white pigment. The plain sherds, which are in the large majority, have not yet been studied. Surface material from Bé, the large mound, 30 km. east of Garoua, mentioned above, is virtually identical to this characteristic pottery which differs both in its forms and in many decorative features from that of the "Sao", in the vicinity of Lake Chad (Lebeuf, 1962). Graham Connah (oral communication) informs me that there are some parallels with Daima wares of the period 1000-1700 A.D.

The trunk containing the material was rifled in transit to the United States, and two charcoal samples, one from the lowest occupation level, were destroyed. Thermoluminescence dates will be run; until these become available, the site can only be attributed in general terms to the local Iron Age, though it should be noted that no trade goods or pipes were found, neither are quartz tools or iron beads known to have been manufactured recently.

The most recent major intrusion into this area took place in the first decades of the 19th century, when Fulani drove out or conquered the Fali and other inhabitants. A date of 1810 may perhaps be taken as a terminus ante quem for the abandonment of the mound.

The research reported above was supported by the National Science Foundation, the University Museum of the University of Pennsylvania, and the Government of the Federal Republic of Cameroun. Further research is planned for 1968-69.

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THE NOK CULTURE: EXCAVATIONS AT TARUGA

by

Bernard Fagg

Taruga is situated approximately in the centre of the Southern Guinea Zone and lies in a group of hills which are cut through by the Takushara River, as it flows westward towards the Gurara River, a tributary of the Niger. The hills stand a few hundred feet above the gently undulating plain of the Benue Valley, and are covered by typical savannah woodland with some rain forest timber species populating the more densely wooded valleys, with the streams occasionally cutting through steep gorges.

The valley itself contains a relatively flat terrace of about three acres in extent, raised up to a few metres above the two small streams which flow northwards to join the Takushara river, about twelve metres below the site. A thin covering of superficial deposits provides an attractive surface for occupation, though most recent and modern villages in the area tend to be situated on higher ground with a better field of view and a healthier and more agreeable climate.

The trial excavations undertaken in January, 1961, during a period of eight days, provided abundant evidence of occupation with a strong presumption that smelting operations had been carried on in the valley. Finds included objects of wrought iron, a quantity of iron slag, fragments of tuyère, large quantities of domestic pottery, a number of figurine fragments, red ochre, quartz hammer-stones, worn-out querns and small concentrations of charcoal. A sample, carefully collected from layer three, forty centimetres in depth, in the densest occupation layer, later provided a radiocarbon determination of  $280 \pm 120$  B.C. (Fagg, 1965).

Apart from the terra cotta figurines, the most interesting finds are undoubtedly the pottery graters (Fagg, 1967), shallow, flat-bottomed dishes, deeply scored inside with a diced pattern to produce a sharply abrasive surface, in all probability used in food preparation. Some are decorated with rim-top grooves and almost all have an elaborately decorated undersurface, both inside and outside the foot-ring, which itself is often decorated, exhibiting a concern for embellishment which surely indicates that they were meant to be seen when not in use.

Deposits inside some of the pots which had the appearance of charred food remains were found on examination to be organic, but without sufficient cellular structure surviving for identification.

The confirmation of an early date for Taruga with its Nok-style figurines was made doubly interesting by the prospect of finding positive evidence of iron-smelting in sub-Saharan Africa at such a remote period. The first opportunity to return to the site and undertake further excavations came in the 1965-66 dry season.

As a preliminary to excavation, a proton magnetometer survey was carried out in an effort to locate furnaces. In spite of some doubts about the likely efficacy of such equipment so close to the geomagnetic equator, the results of the survey, the first recorded use of the proton magnetometer under tropical conditions, were outstandingly successful (Tite, 1966).

Sixty-one magnetic anomalies were located, the majority of which were in the flat central area, which probably indicates the limits of actual occupation. Because it was, initially at least, impossible to predict from the readings what type of feature was indicated, since reverse anomalies and not normal ones (as in Europe) are more significant so near to the geomagnetic equator, the partial excavation of all the anomalies was carried out. Twenty anomalies revealed concentrations of slag and nine of these contained in situ the structure of furnace walls and bases. It is certainly possible that remains of others may be found beneath the slag in some of the other eleven. One other furnace was located at a point which the magnetometer did not reach. Of these ten furnaces, one was partially excavated in 1966.

The figurine fragments recovered during the 1965-66 season have made possible the reconstruction of a substantial part of a large human figure, consisting of an almost complete arm, bent at the elbow, from the right shoulder to the right hand, depicted as a fist clenching an object which cannot be identified. There are also a few fragments of the left shoulder which indicate an identical treatment. These fragments represent part of what must have been an extremely powerful piece of sculpture, and, presuming that it represents a standing figure, it was probably about 90 cms. high.

Fragments of domestic pottery are by far the most numerous of all the artefacts excavated at Taruga and can be divided into two main types: a) bowls or shallow basins, without lips,



and b) globular pots with everted lips. The former have diameters ranging from 26 to 36 cms., while the latter vary between 14 and 22 cms. The globular pots resemble modern cooking pots used for soup, or, more accurately, relish. The two types described above account for the vast majority of the potsherds excavated. Decoration includes comb-reeing, channelling, rouletting, curvilinear incisions, cross-hatching and impressed circles.

An indication of the density of the pottery in the site is given by the results of the 1961 excavations, when about 26 cubic metres of deposit were excavated. These yielded a total weight of 110 kgms. of sherds. Neither the distribution pattern of the furnaces nor the evidence of the pottery give sufficient indication of the precise function of the site. It remains to be determined therefore whether the site represents anything more than an industrial site for seasonal occupation.

The first of a series of radiocarbon determinations on charcoal samples from the second season's work has produced a date of  $440 \pm 140$  B.C. (I-2960). This comes from a horizon 24 cms. below the base of the collecting zone for the earlier determination, thus providing satisfactory confirmation. A piece of iron slag was recovered in association with this charcoal sample.

The total absence of polished stone axes at Taruga and the identity of the style of the figurines with those found at the type-site at Nok does not support for Taruga the tentative conclusion drawn from the evidence of the alluvial deposits at Nok (Fagg, 1959) that the cultural context was transitional between the Neolithic and the Iron Age.

Until the presence of neolithic elements can be established beyond doubt elsewhere in the excavation of an undisturbed site, the Nok Culture will now have to be regarded as belonging exclusively to the Iron Age.

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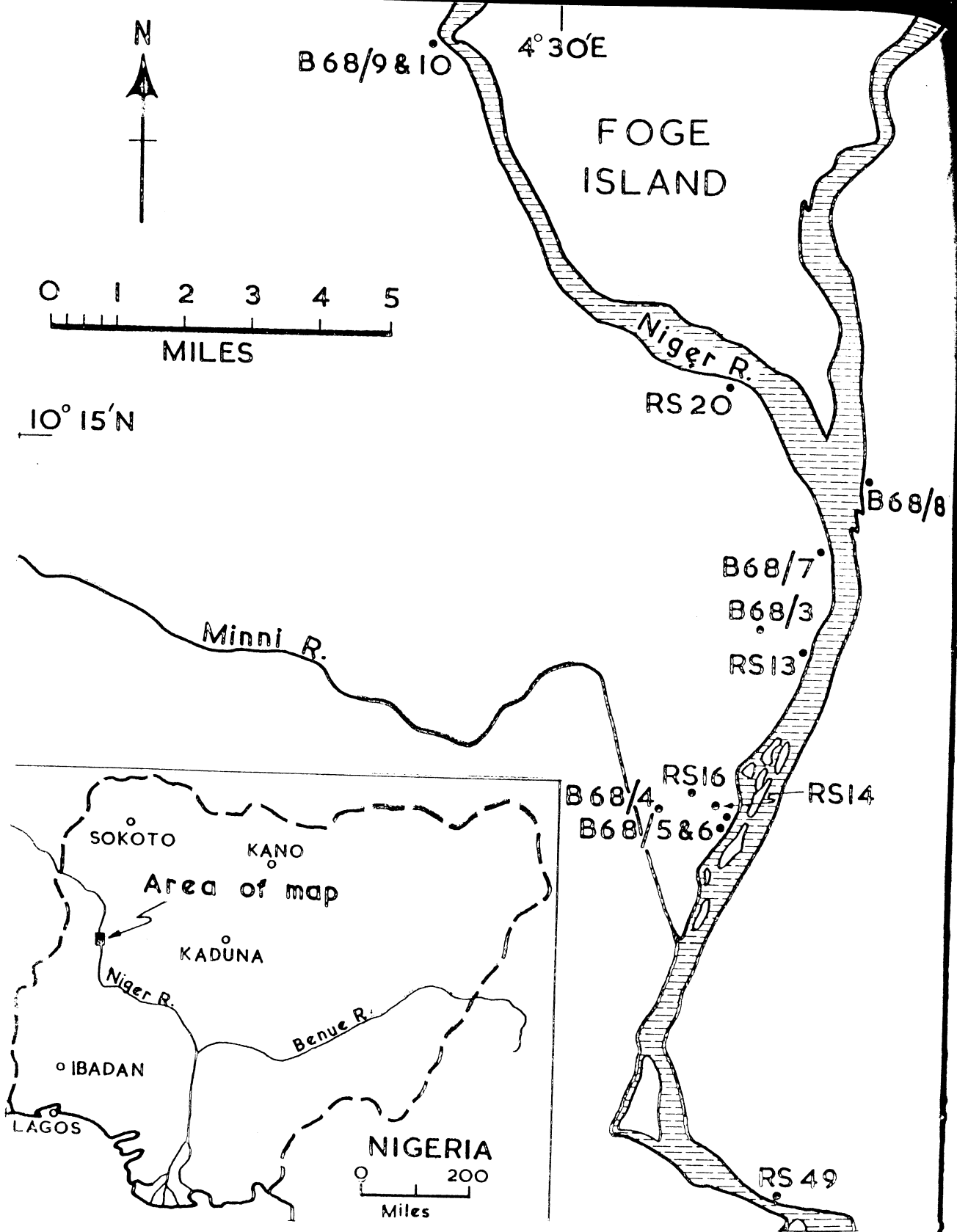


Figure 1. Map showing locations of sites excavated by CU-KRAP, 1968.

INTERIM REPORT OF THE UNIVERSITY OF COLORADO -  
KAINJI RESCUE ARCHAEOLOGY PROJECT, 1968

by

David A. Breternitz

Through a complicated series of circumstances and events, it was possible for the University of Colorado Archaeological Expedition to Tunisia to transfer some of its personnel and some contributing funds for archaeological research to the area to be flooded in the fall of 1968 by the Kainji Dam on the middle Niger River. These notes report briefly on the work accomplished by the University of Colorado - Kainji Rescue Archaeology Project.

Actual field work began on 14th February and continued through 11 June, 1968. The location of field headquarters at the Shagunu Research Station meant that logistically the area to be investigated was centered around Bussa, until recently the site of the capital of the Emirate of Borgu (see Fig. 1). Testing was conducted at a total of 13 sites, at which 27 test pits were dug, 10 shrines recorded, and three miscellaneous groups of archaeological material collected.

An initial survey of the area was conducted by Robert Soper in 1962-63 and his recommendations of sites to be excavated guided the initial selection of digging localities. Further sites were recorded by the University of Colorado team. Those sites recorded by Soper were designated by an "RS", followed by his site number; those recorded by the CU-KRAP were designated by a "B68/", followed by the site number. The sites excavated/investigated, by name, number, and the units excavated at each are as follows:

Bussa, B68/7 - Test 1  
Diebet, B68/3 - Test 1; Shrines A and B  
Kabigera, RS16 - Tests 1-3  
Kagogi, RS20 - Tests 1-8; Shrines 1 and 2;  
Trash slope and borrow pit material  
Malali, RS49 - Test 1  
Monai, RS13 - Tests 1-5; Iron Gongs; Areas A and B;  
Test 5, Feature 1  
Old Bussa, B68/5 - Tests 1-2  
Old Bussa, B68/6 - Tests 1-2  
Old Bussa, Emir's Palace, RS14 - Collection of  
exposed material

Shagunu Research Station, Shrine A, B68/9  
Shagunu Research Station, B68/10  
Tafonogira, B68/4 - Test 1  
Old Warra, B68/8 - Tests 1-4

Further Notes on Work Accomplished

Most of the test pits were 3 by 3 metre squares, usually dug in arbitrary 20 cm. levels. On account of soil conditions, most occupation surfaces and supposed floors were not readily apparent until they were exposed in section. The exceptions to this situation were the six potsherd pavements/floors found at Old Warra, B68/8.

BUSSA, B68/7 - A single test pit was put down in the area around the dye pits after Bussa had been resettled to New Bussa (Kainji). Results were disappointing, little material found, and sterile sand was reached at a depth of 1 metre.

DIEBET, B68/3 - A single test pit put down in the house mound area disclosed a fill of undifferentiated, compacted, orange, sandy gravel which reached the laterite bedrock at a depth of one metre.

Shrine A - Our local informant stated that this was a female shrine. Depth to sterile was only 20 cm. The surface indications of a shrine were the presence of four large overall-roulette jars. A few pieces of iron and an assortment of grinding tools were recovered.

Shrine B - This was a male shrine. Again, sterile was reached at 20 cm. Two large jars and several broken vessels marked the shrine, which also produced an iron knife blade and miscellaneous grinding tools.

KABIGERA, RS16 - Kabigera was the legendary site of the village founded by Kisra, who supposedly established the Borgu Emirate (Hogben and Kirk-Greene). It was well-known for the iron staffs which marked the site.

Tests 1 and 2 - These tests in trash and house mound areas, respectively, produced no data to show the antiquity of the site.

Test 3 - A trench 10 x 1 m. was dug through the mound surrounding the iron staffs and extending to the iron staffs themselves. The mound was supposed to mark the remains of a hut formerly constructed around the iron staffs. An occupation

surface was noted at a depth of 20 cm., but no definite evidence of walls or floor were found.

The nine iron staffs were surrounded by a group of red-slipped, flanged-base libation (offertory) bowls and scattered iron objects in the form of rings and bracelets. Of note was a small bronze statuette of a seated human figure; the style of this statuette has not been familiar to the several persons who have given it a cursory examination.

KAGOGI, RS20 - In the dry season of 1967, Mr. A. J. Priddy of the Nigerian Federal Antiquities Department dug four test pits at Kagogi. In the process he uncovered a series of "burnt clay ditches" at a depth of 2.4 to 3.0 m. below the surface. Their unique nature and unknown function were instrumental in the decision to conduct further excavations and possibly locate more of these features; however, our work failed to locate any more "burnt clay ditches".

Kagogi is a large village mound, perhaps 200 metres long and the fallen remnants of a once encircling wall are readily visible. The village mound is cut into by a series of borrow pits which show trash deposits up to 3.5 m. in depth. Tests 1, 4-8 were dug above one of these trash exposures at the western edge of the village; Test 2 was in the centre of the village; Test 3 in a trash mound at the eastern edge of the village.

Test 1 - Trash and occupation was evident to a depth of 4.20 m. in this test. Nine burials were recovered from the test with a rather rich burial with assorted iron, ceramic, and shell artefacts in accompaniment found at the very base of the trash, resting on sterile sand. Rodent activity was intense in the trash deposit and buried house floors/occupation surfaces were spotty and seen only in section.

Tests 4-8 - These tests were dug adjacent to Test 1 in an attempt to locate more burials. They were each dug to a depth of only 60 cm., in trash which produced a great many potsherds, numerous ceramic vessels, and three burials.

Test 2 - This test was put down through a section of a recently abandoned house, in the hope of obtaining sealed trash. However, the area was one used primarily for habitations and the trash present was thinly represented in potsherds and artefacts. Sterile sand was reached at a depth of 3.60 m. A rich burial was found at 2.80 m., with literally thousands of shell beads associated. Another

burial from the same depth was fragmentary. Evidence of occupation surfaces was seen in section only.

Test 3 - Very little information was obtained from this test and sterile soil was reached at 1.20 m. A possible burial was in too bad a condition to record adequately.

Shrines 1 and 2 - Two modern shrines on poles, in compounds southeast of the main village of Kagogi, were recorded. Shrine 1 included three decorated iron staffs.

MALALI, RS49 - R. Soper noted the presence of pottery with quartz artefacts and suggests that this site might be "microlithic". A test pit was dug to a depth of 60 cm., but sterile orange river sand was reached at 30 cm. No stone artefacts were found in association with the excavated pottery. The sherds were highly eroded, and smaller than those recovered from other sites. These features gave the impression of greater antiquity, but the types found did not differ significantly from materials excavated from other sites. The erosion of the potsherds may have been due to the soil conditions, or to some local secondary deposition.

MONAI, RS13 - Monai was the site of the Borgu Gongs and was marked by huge baobab trees growing out of trash and house mounds which were up to three metres in height.

Iron Gongs; Areas A and B - The four, iron, double-gongs rested on the surface of a small "glade". These were recorded and removed. Within 5 to 8 metres, to the north and north-east, were two associated shrine areas, Areas A and B.

Area A - This shrine was marked by an iron staff (actually the shaft end of a spear) and an iron ladle, both set in the ground on the concave side of a group of vertical schist slabs. Area A was reported by the local informant to have been covered by a hut, and some patches of a floor, plus two or three possible postholes, were found. Under the surface were additional iron objects and a series of offertory vessels. Area A was a male shrine.

Area B - This unobtrusive slab cist proved, upon excavation, to contain a pebble/quartz crystal cache, large river cobbles, offertory vessels and lamps, and iron anklets. It was reportedly the accompanying female shrine associated with the Iron Gongs and Area A.

Test 1 - A test pit immediately north of the Iron Gongs produced nothing of associated interest or information.

Test 2 - Sterile sand was reached at a depth of one metre; it was a trash area with the possibility of one occupation surface seen in section.

Test 3 - This test, at the western edge of the site, was cut into a mound  $1\frac{1}{2}$  m. high. Sterile sand was reached at about two metres below the surface of the top of the mound. Many oyster shells were found, in pockets and layers, throughout the excavation. At 1.80 m. beneath the surface, a line of vertical schist slabs was found, curving in a slight arc. These might have represented a shrine(?) because of the association of a concentration of cobbles and a flanged-based vessel, but they might also only have marked the location of an oyster shell opening operation.

Test 4 - Aside from the very hard fill of Test 4, the notable findings were two burials, at approximately 1.25 m. below the surface. Burial A was richly accompanied by iron and bronze objects and many ceramic and shell beads. An iron hoe was placed under the head in a manner similar to the burials of the former Emirs of Borgu which were excavated from Old Bussa (Site RS15) by A. J. Priddy.

Test 5 - At the northeast corner of Monai, within 10 metres of the Niger River, was a mound some 3.5 m. high. A test pit was dug to a depth of 2.00 m., which may not in fact be to sterile soil. Artefactual yield was similar to other tests, except for the schist-slab base of a granary which appeared at the 1.50 m. level.

Near the base of the mound, on the river side, a "cobble shrine" was recorded. This shrine was designated Test 5, Feature 1 and consisted of a concentration of 1 large boulder, 5 partial offertory vessels (all red-slipped), 1 grinding stone, 1 pecked stone, and 25 water-worn river cobbles and pebbles.

OLD BUSSA, B68/5 - Both B68/5 and B68/6 were no doubt occupied, at least, during the 19th century when Old Bussa was visited by such persons as Mungo Park, the Lander brothers, Sir John Glover, and Hugh Clapperton. Without definite temporal data this statement is based on the amount of 19th century chinaware and glass on the surface and the historical descriptions of Old Bussa by these early European explorers.

Test 1 - A trash mound about 12 metres northeast of the site of the old mosque produced trash to a depth of 1.95 metres.



One burial was recovered, again resting on the underlying sterile sand.

Test 2 - This test was in a supposed house mound. One possible house floor/occupation level was encountered at a depth of 60 cm. and sterile sand was reached at about 1.40 m.

OLD BUSSA, B68/6 - This site is about 100 metres north and east of B68/5 and it was given a separate site designation on account of the unoccupied interval between the two areas. However, sites B68/5 and B68/6 were probably both occupied contemporaneously and were probably simply separated villages or compounds of Old Bussa.

Test 1 - This test pit in a trash mound had fill which was highly rodent burrowed, ashy, and soft, as one would expect in a trash area. One possible floor/occupation level was found, at a depth of about 1.00 m. Sterile sand was reached at 2.00 m.

Test 2 - Test 2 was dug into a supposed house mound; two or three occupation surfaces were detected, in section. Six pottery vessels from this test enforce the supposition that this was a house mound. Sterile sand was reached at between 2.12 and 2.18 m.

OLD BUSSA, EMIR'S PALACE, RS14 - A miscellaneous collection of material exposed by A. J. Priddy and left at the site was recorded and collected. These were, in effect, 12 pots and two iron objects. RS14 was the Emir's Palace visited and described by the early 19th century European explorers.

SHAGUNU RESEARCH STATION, SHRINE A, B68/9 - This shrine was cleared and was unspectacular. Two broken ceramic vessels, one hammerstone, and some large animal bones were found in an area outlined by vertical and flat-lying stone slabs.

SHAGUNU RESEARCH STATION, B68/10 - This site was on the first terrace above the Niger River and was identified by the surface occurrence of six ceramic vessels, two pieces of iron, and a modern button. At first it was thought that the site was another shrine, but under the westernmost two vessels a floor was found which indicates that the site was a habitation, rather recent. The fact that the floor level was only 5 to 10 cm. beneath the surface (a seventh vessel was found crushed on this floor) negates further speculation.

TAFONOGIRA, B68/4 - This site was found while attempting to locate another reported iron staff site.

Test 1 - Finds were sporadic and non-diagnostic except for the trash lying just above sterile sand, at the 100 to 120 cm. level. All artefacts, other than scattered potsherds, were found lying right on sterile sand - 6 cowrie shells, a clay pipe, an iron striker for flint-and-steel, and a large sherd.

OLD WARRA, B68/8 - This site consisted of a series of 6 mounds, 3 to 4 metres high, about  $\frac{1}{4}$  mile south of the boat-landing at the recently abandoned and resettled village of Warra. (Within 100 metres to the north was another, walled, site, B68/11, with four interior mounds which could not be investigated because of lack of time and the onset of the rainy season.)

Test 1 - Unfortunately, lack of time and the extremely compacted fill prevented completion of this test. However, of note were five potsherd pavements/floors found in this test - at depths of 1.35, 1.78, 1.83, 1.92, and 2.40 m. in depth. Three other possible floor levels were seen in section. Nupe colonization is supposed to have reached the tip of Foge Island and the possibility that this site is, at least in part, an old Nupe village should be further researched. Although the test was dug, through mud and water, to a depth of 2.70 to 2.80 m., there was probably at least another metre of trash before sterile would have been reached.

Test 2 - This test was dug, through highly compacted fill, only to a depth of 1.20 m. One, and possibly two floor levels were encountered, but sherds and other occupation evidence were sporadic, and pocketed.

Test 3 - At a depth of 42 cm. a potsherd pavement/floor was found. Otherwise nothing of note was encountered and excavation was terminated at 80 cm., before sterile was reached.

Test 4 - Test 4 was dug in a mound adjacent to the Niger River and the fill was sandy and soft, in contrast to the very hard and compacted fills noted for Tests 1-3. Sterile sand was found at a depth of 2.00 to 2.50 m. As the test was dug into the slope of the mound, the various lenses were tipped also.

## Results and Observations

LIVING AREAS AND TRASH DEPOSITS - Some of the areas excavated were obviously used both for occupation and trash deposition; others were fairly predictable in producing either trash or evidence of habitation. Burials were usually found in the combination of trash and occupation areas. Ceramic vessels, the majority inverted, were found in both occupation and trash deposits. The six potsherd pavements/floors were all found at Old Warra, B68/8.

CERAMICS - One hundred and sixty-three whole or restorable vessels were recovered from the excavations, including a series of vessels eroding from trash slopes and borrow pits at Kagogi. These vessels will serve as a basis for further analysis of the excavated potsherds.

All of the 22,000 excavated potsherds were typed/counted in the field. All of the pottery vessels were restored, typed, photographed, and measured.

Of particular note is the fact that no significant differences were apparent in either the sherds or the vessels, from site to site, with the exception of the eroded sherds from Malali, already noted. Local preference for, say, micaceous-tempered pottery over grit-tempered pottery does not seem to have been significant. Only detailed laboratory analysis of the vessels and the excavated potsherds will possibly show any temporal distinctions.

The vast majority of the pottery was decorated either singularly or in combinations of red-slipping, rouletting, incising, and punctating. With but few exceptions, the excavated ceramics can be duplicated by collections of modern pottery seen at the recently abandoned and resettled villages in the area.

Only 19 ceramic artefacts were found, as follows: 6 spindle whorls; 1 sherd triangle; 5 sherds utilized as scrapers; 2 sherd disks; 1 clay cone; 1 labret(?); 1 clay plug(?); and 2 ceramic pegs. The latter two artefacts were found in an inverted, rouletted, incised, red-slipped jar in the trash slope below Test 1. They are said to be a ritual burial made by a widow, soon after the death of her husband - they are markedly phallic.

In addition to the ceramic artefacts noted above, three modelled clay figurines were found eroding from the trash slope north of Test 1, at Kagogi. The largest figurine is a

seated male (seated height 31.5 cm.) with quite naturalistic head features. It has coffee-bean eyes, both nostrils of the pinched nose were punched when the clay was still plastic; the open mouth was also punched out while the clay was wet; alveolar prognathism is apparent; the chin is pointed and prominent; and the ears are at right angles to the head, rather large, and an "ear-hole" was also punched in the damp clay. Another specimen is represented only from the waist up, but the facial features are almost identical to those of the larger figure. A third modelled clay object is too incomplete to identify, but is different from the two anthropomorphic specimens and may be a zoomorph(?). All three of the modelled clay figurines are made of the same clay used for making the walls of mud huts, including the use of grass as a binder for the clay. All three specimens have been burned, but it is not known whether this was intentional or not. No positive identification of possible ethnic or functional connections have been made for these clay figurines.

Fifty-five ceramic pipes and fragments were excavated. These might provide some temporal distinction, when studied.

All the sherds of glass or chinaware but one were found at the Old Bussa sites (B68/5 and B68/6). At least some of this material should be datable.

STONE - Stone artefacts were for the most part non-descript, consisting of utilized grinding stones and fragments of grind stones. The hammerstones are, as usual in archaeological contexts, undiagnostic. 124 stone artefacts were recovered, as follows: 33 grind stones; 47 grinding stones; 26 hammerstones; 2 perforated stones; 4 polishing pebbles; 1 chipped disc/chopper; 1 chipped disc/pot lid(?); 1 knife; 4 schist bracelet fragments; 1 carved stone; 4 quartz cylinders/labrets(?).

METAL - The notable metal objects were mainly from the shrines at Monai, RS13, and Kabigera, RS16. Other metal objects, in the form of iron hoes, axes, and bracelets, were associated with various burials. Then, in most levels at most of the test pits, bits and pieces of iron were found.

Bronze objects recovered included 3 or 4 bracelets and the unique statuette noted previously from the site of the iron staffs at Kabigera, RS16.

BONE AND SHELL - Most bone and shell was unworked and collected with general level collections; they have yet to be studied.

In addition, two pieces of carved bone; 1 piece of cut bone; and one fragmented ivory bracelet (from Burial A, Monai, Test 4) were found.

Shell beads were normally found with burials. They number in the thousands, ranging from minute shell beads up to 4 cm. in diameter. R. W. Ashford, Department of Zoology, University of Ibadan, has identified the source of the larger shell beads as Anadara sp., which is a brackish water bivalve. As the Niger River is thus ruled out as a source for the raw material for these shell beads, perhaps we can look to the south/coastal regions as the ultimate origin of these beads. In addition, numerous cowrie shells which were found are also probably indicative of trade from the coastal region(s).

GLASS AND CERAMIC BEADS - These objects were, also, usually associated with burials. Some, when further studied, will possibly yield information on their locale and time period of manufacture. Some of these beads appear to have a Mediterranean(?) origin.

SHRINES - The 10 shrines recorded are probably modern. Those at Kabigera, RS16, Monai, RS13, and Diebet, B68/3, were used up to 35 years ago. The two shrines at Kagogi are recent. The cobble shrine at Monai (Test 5, Feature 1) and the Shagunu Research Station, Shrine A (B68/9) require further documentation.

BURIALS - W. D. Wade has made detailed analyses of the 18 burials recovered during our excavations, plus four remains of former Emirs of Borgu exposed at Old Bussa by A. J. Priddy. Burials were mainly in trash, either extended or slightly flexed; the majority were unaccompanied. Exceptions to the unaccompanied graves were notable by a profusion of burial goods, namely Burial 9, Test 1 and Burial A, Test 2 at Kagogi, and Burial A, Test 4, at Monai.

The remains of four former Emirs were removed, in accordance with the wishes of the Emir of Borgu, to ground which will not be flooded by the pool of the Kainji Dam. Burial boxes for these remains were placed in a specially designated area about  $\frac{1}{4}$  mile north of the Shagunu Research Station. The four graves were placed at the corners of a 3.75 metre square, oriented north-south, and a ritual water pot placed in the centre of the burial square.

### Final Statement

The preliminary analysis of the materials obtained by the CU-KRAP indicates a remarkable lack of apparent change in the artefact complement of the sites excavated. This feature is thought to be a reflection of the lack of any significant climatic change during the period of occupation of the sites investigated, plus the feeling that once the people occupying this area made their initial adjustment to the environment, it was not necessary to develop new or different tools. The tools which were needed to cope with the environment 200 or 500(?) years ago are still suitable today. It seems that since the introduction of iron, whenever that happened to be, only such items as china, glass, enamelware, and plastic have been added to the tool inventory.

The section of the middle Niger River under investigation would, from intuition and physical appearances, be a fine area in which to look for evidence of the beginnings of agriculture. However, no such evidence came to light, and I do not know how one would go about looking for such evidence - the lack of erosion surfaces and change in the terrain give no evidences that this, that, or the other site might be fruitful in the search for evidences of agricultural origins in West Africa.

All materials excavated and all records are housed at the Institute of African Studies, University of Ibadan, with the exception of the ceremonial iron from Monai and the iron and ceramics from the site of the iron staffs at Kabigera which have been given to the custody of the Emir of Borgu.

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### Notes

Space does not allow an acknowledgement to all the individuals who aided and abetted this project, in one way or another. However, the degree of complicated involvements is indicated by the number of institutions who contributed to its success: The Institute of African Studies, University of Ibadan; Impregilo (prime contractors for the Niger Dams Authority); Joint Consultants (Balfour Beatty, Inc. and NEDECO); National Science Foundation; Nigerian Institute for Social and Economic Research; Nigerian Federal Antiquities Department; Smithsonian Institution; U.N.E.S.C.O.; University

of Colorado. Over-all coordination of the Kainji Rescue Archaeology Project was by Professor Thurstan Shaw. The two other archaeologists on the University of Colorado team were Larry L. Leach and William D. Wade.

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THE GENESIS OF TYPES: A LOGICAL MODEL\*

by

S. G. H. Daniels

For all practical purposes, the comparison of assemblages, and thus the study of cultural change and relationships, requires that the material in each assemblage be divided into homogeneous groups which we term 'types'. While the direct comparison of assemblages, without reference to types, seems a theoretical possibility, we find in practice that typology is fundamental to archaeological research. Unlike zoological taxonomy, where the division into groups such as species and genera is based on underlying evolutionary and genetic theory, there seems to be no such theoretical basis for the division of archaeological artifacts. The further problem of what constitutes an artifact is one which, for reasons of time, I cannot discuss here: I shall therefore assume that assemblages consist entirely of artifacts.

Following the Wenner-Gren symposium at Burg-Wartenstein in 1965, I think it clear that we must reject function as a basis for typology, since our 'knowledge' of function is at best a convincing assumption, at worst a wild guess. We are therefore compelled to a position in which typology depends only on the observable features of artifacts. These observable features are commonly divided into morphology (or broad outline shape) and possession of defined attributes, such as technological features in stone tools or decorative motifs on pottery. It goes without saying that the recognition of defined attributes itself depends on the observation of details of form or other measurable features, and since the same model which I am proposing for the emergence of types is also applicable to the emergence of defined attributes, I shall confine these brief remarks to morphological types.

Archaeological typology has its origins in classification, and while the aims of the typologist are no longer simply those of the classifier (e.g. for his own convenience in such matters as economical storage and information recovery), classificatory habits of thought die hard. When we force ourselves to answer the question 'Is or is not this object

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\* Paper delivered at the VIth Pan-African Congress on Prehistory and the Study of the Quaternary, Dakar, 1967.



Since we have introduced the question of the quantification of difference, we may usefully turn our attention to a geometrical representation which follows from the process of quantification. A multi-dimensional space is set up in which each orthogonal axis represents one of the variables observed on the collection of artifacts, the number of dimensions corresponding to the number of observed variables. Each artifact is represented in this space, which may be called Character Space, by a point. Similarity sets will then appear as clusters in the character space since the difference, and corresponding distance between their members is small. However, while the existence of a cluster may be readily apparent, the drawing of a boundary about the cluster is arguable, and a defined criterion for boundary placing must be adopted. The criterion having been defined, the artifacts represented by points inside the cluster-boundary constitute a special case of a similarity set, which we may term a Type Set. I would suggest that the value of any typological division of an assemblage depends on the extent to which categories so produced reflect type sets within the assemblage; and the validity of processes applied to typological categories depends on the validity of applying those processes to type sets.

Looking back over the process by which the type set was defined, we see four important references which are necessarily implied when we speak of a type set. Three of these, the boundary-criterion, the quantification procedure, and the variables observed, are generally speaking explicit only in quantitative mathematical treatment. The fourth and most important, however, is equally necessary in mathematical treatment and in non-quantitative work: this is the fact that a type set exists only within a given group of artifacts. We cannot speak of a type set in isolation from the group, or Field, within which it occurs, any more than we can speak of two artifacts being similar without reference to other artifacts. The type sets of a field are proper only to that field. It is therefore fundamentally improper to classify an assemblage of artifacts from one site on the basis of the type sets contained in the assemblage of another site. To validate the procedure we must assume that the two assemblages are both representative samples of the same parent population: but this assumption depends on typological comparison of the two assemblages, and an unacceptable circular argument develops. The transfer of a type list from one assemblage, or one industry, to another, may mean that what was a fine analytical description of the field in which it originated, is no more than an arid classification in the

field to which it is transferred. For comparison of assemblages we must either use the type sets generated by each assemblage, or perhaps pool the assemblages into a combined field which will generate its own type sets.

There are implications here in the terminology of tool forms. The term is a label, the type set the referent: are we justified in transferring the label from field to field, when, as we have seen, the referent is fundamentally non-transferrable? If we try to ensure that we all use a term in the same sense, we are in danger, in some areas and periods, of letting loose that logical monster, the label with no referent.

For a typology based on the similarity set concept, I have used the term Analytical Typology, in distinction to systems which, while perhaps analytical in intention, are classificatory by habit. Analytical typology is not in essence a classificatory system, but an analytical method. Let us make one simple, and I hope acceptable, assumption about the historical origin of artifacts: that under given conditions, the artifacts produced by a given human group are not entirely random but tend towards certain specific forms. The analytical study of type sets then becomes the study of these group tendencies. It is the study of these tendencies, of the dynamics of a material culture, which should be the proper field of study of the typologist. Since it is the tendencies and not the individual artifacts per se, that we wish to study, we may permit ourselves the luxury of refusing to answer the question 'Is or is not this object a Levallois point?', on the grounds that it is not fundamentally relevant to the study. We may bypass the limitations of classical logic with its either/or propositions, and think instead in probabilistic terms of the location, dispersion and density of modal types in character space as estimates of tendencies among the groups which produced them.

The practical difficulties in implementing such an approach are enormous, and despite the great advantages of large-capacity computers in making possible calculations which would otherwise have taken a lifetime, I doubt its immediate applicability in detailed practical terms. I would suggest, however, that it is along these lines that we must develop the study of artifacts, if archaeology is to contribute, as I believe it should, to the vitally urgent scientific study of the behaviour of human groups.

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THE TAKORADI RADIOCARBON DATE

by

Colin Flight

Radiocarbon dating made a slow start in Ghana. The first and for several years the only date was for a site at Takoradi. Its interest is largely geological: it refers to a late stage of the Holocene marine transgression (Davies 1964: 158-9). The sample, of mangrove wood, was collected by Dr. Davies and processed by the Groningen laboratory. It gave a reading (Gro-1194) of  $5570 \pm 70$  B.P. (de Vries & Waterbolk 1958: 1552).

The date is still being cited in this form (Davies 1968: 45), despite the correction which the authors make in their introductory remarks on the previous page. They consider some of the sources of error to which radiocarbon dates in general are liable. To compensate for the fossil-fuel effect they conclude: 'As a first correction, 240 years should be added to all Groningen radiocarbon dates published up to now, including those in the present list' (de Vries & Waterbolk 1958: 1551, emphasis mine; cf. Vogel & Waterbolk 1963: 164).

Accordingly the Takoradi date should be given as follows:-

Gro-1194             $5810 \pm 70$  B.P.            3850 B.C.

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