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Material Characterisation of "Kintampo Cigars"

E. Kofi Agorsah

Portland State University, agorsahe@pdx.edu

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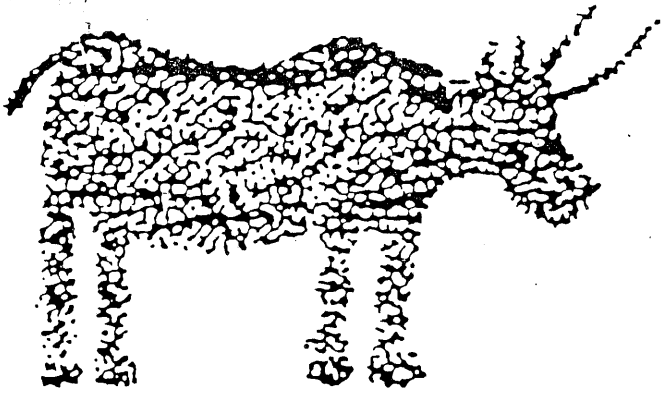
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Agorsah, E.K. (1986). Material Characterisation of "Kintampo Cigars." *Nyame Akuma: A Newsletter of African Archaeology*, 27, 6-9

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NIYAME AKUMA

A NEWSLETTER OF AFRICAN ARCHAEOLOGY, Number 27, May 1986

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MATERIAL CHARACTERISATION OF "KINTAMPO CIGARS"

DR. E. KOFI AGORSAH
DEPT. OF ARCHAEOLOGY
UNIVERSITY OF GHANA
P. O. BOX 3
LEGON ACCRA.

Archaeology has in recent years taken advantage of scientific and technological innovations in the description of the raw materials. As far back as 1956 Shepard used petrographic analysis of ceramic tempers to distinguish different ceramic types. Several characterisation techniques that have been found to be useful include X-ray fluorescence, instrumental neutron activation, optical spectroscopy and x-ray diffraction to mention a few.

Characterisation studies have helped obtain data on distribution of raw materials from identifiable sources related to exchange (Earle 1977). Such studies are useful also for identifying the nature of archaeological objects as well as their mode of manufacture (Agorsah 1976) but only very few examples can be found in West African archaeology not only because of the absence of facilities for conducting such studies but primarily because research designs have ignored that aspect of study.

This short note is to provide information on material characterisation of one of the most controversial artifacts in African archaeology the so-called Kintampo cultural tradition "rsaps" or "cigars".

The first attempts to explain the objects in question here made by Davies (1959) who called them "terracotta cigars" because he thought they were hard-baked clay which looked like cigars. Colin Flight (1967:68) called them "stone rasps" made out of a type of sandstone; probably what Posnansky (1972) referred to as "dolomitic marl". Calvocoressi (1969) describes them as made of leached "limonitic marl".

The object in question is well known to archaeologists working in Africa, West Africa particularly but for the benefit of others a paragraph providing some background information is required.

The "Kintampo cigars" are generally cylindrical and oval in section usually measuring about 15-22 cm long and 3-5 cm wide in the middle section. Majority of them have geometric scorings various

early food producing cultural tradition dated in Ghana to some 4000 years ago (Flight 1968, Posnansky 1972). Objects associated with the tradition include polished stone axes (*nyame akuma*) (Twi), grooved stones (bead polishers), stone bracelets stone beads, biconically bored stones, upper and lower grinding stone, terracotta figurines (Fig.1) and large quantities of pottery and burnt daub. The most popular sites in terms of systematic research, publication, and qualitative data are Kintampo, the site from which the tradition derives its name, (Flight 1967, 1968), Ntereso (Davies 1967,) New Buipe (York 1973), Mumute Agorsah 1973, 1976) and Bonoase (Dombrowaki 1978).

Geological analysis:

In 1973 six pieces of cigars from the site of Mumute (7° 51'N and 2° 29'W) in Brong Ahafo of Ghana were examined in the 1 laboratories of the Department of Geology, University of Ghana. The purpose was to attempt to establish whether the objects were made out of some kind of stone or were of baked clay.

The observations made on the six samples were as follows:

Sample No.

Cigar
(fragment)

1. - High porosity; very rich in iron; thin section shows no evidence of baking. Specific gravity (S.G.) is 1.96.
2. " High porosity; iron rich. possibly baked because of changes in the marginal areas s.g. is 1.72
3. " Normal clay content. Possibly baked.
4. " Definitely baked. Clay is indicated by textural changes along the margin and the formation glass s.g. is 1.83
5. " Low porosity. Definitely baked as indicated by the textural changes along the margin; Perhaps due to result of differential firing, and formation glass throughout the section. s.g. is 1.84
6. " Quite high porosity. Probably baked; evidence is not very clear. There seems to be formation of glass throughout section.

CIGARS

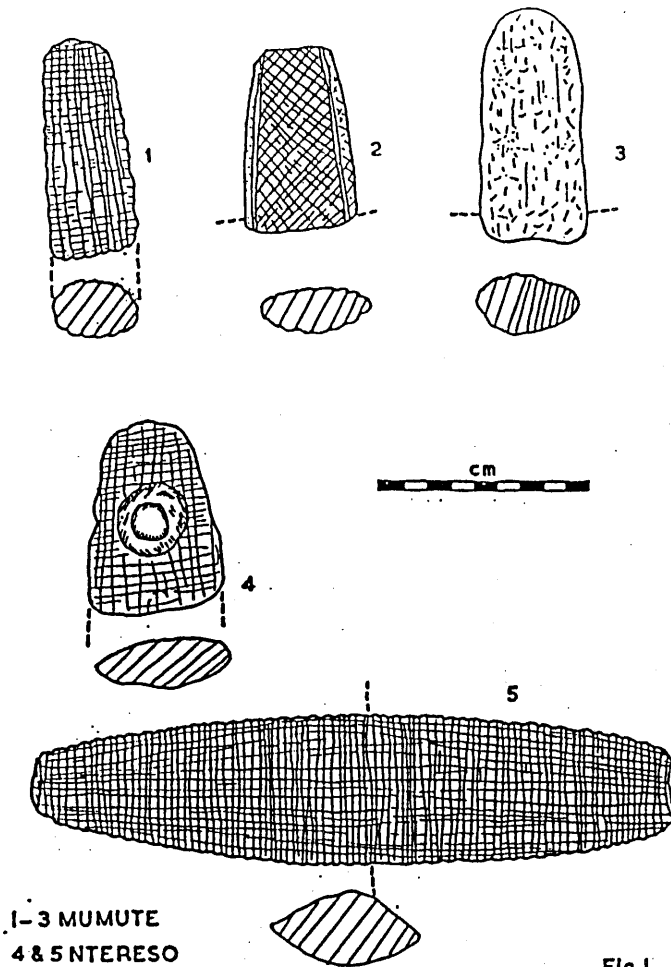


Fig.1

J. Winter the geologist who analyzed the specimen comments that generally samples 1 and 2 consist of iron rich clay while 3-6 are normal clay material. He thinks that the cigars are too soft for grating hard material such as rock or wood, an assertion supported by hardness test the result being MOH 3.0.

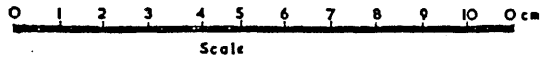
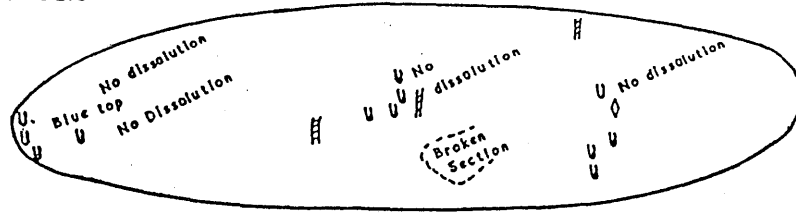
A Stereo-Microscopic microscope is fundamentally two microscopes, one for each eye, combined for convenience in a single instrument. The two eyes view the same specimen from separate angles and the result is real stereoscopic perception of depth. The cigars were not sufficiently transparent or translucent and only the surface could be examined firstly to observe the nature of the grooves (their depth, sharpness) and to attempt to relate its features to the kind of impact that may have been used in making the grooves in them. Another objective was to examine the wear pattern especially the direction of wear. Only one specimen of "cigar" from the Kintampo (K6) site was available for this examination.

Inside the grooves were embedded some fibrous and crystalline substances (Fig.2). The crystalline was clearly a result of the firing of the objects during manufacture. A toxic organic solution was later applied to specimens of the fibrous organic substance and it turned out to be of animal rather than suspected plant material. How this substance got embedded deep inside the grooves is uncertain. I suspected that this may have got on to the piece of "cigar" during processing after excavation. Since only one specimen was available this could not be rechecked.

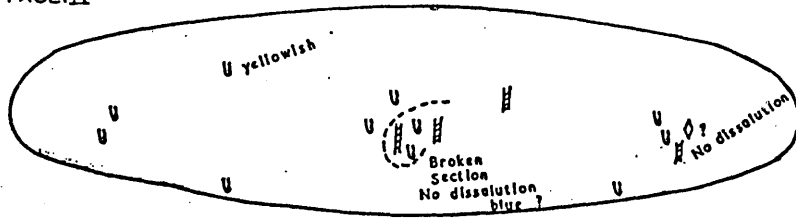
It is intended that similar examination be conducted on more "cigars" especially those handled specially to avoid external substances from sticking to their surfaces.

STEREO-MICROSCOPIC ANALYSIS OF CIGAR FROM KINTAMPO

FACE.I



FACE.II



- U Crystalline
- H Fibrous substance
- U H Mixture of U and H
- ◇ Glassy

Fig.2

X-RAY FLUORESCENCE ANALYSIS OF KINTAMPO "CIGAR"

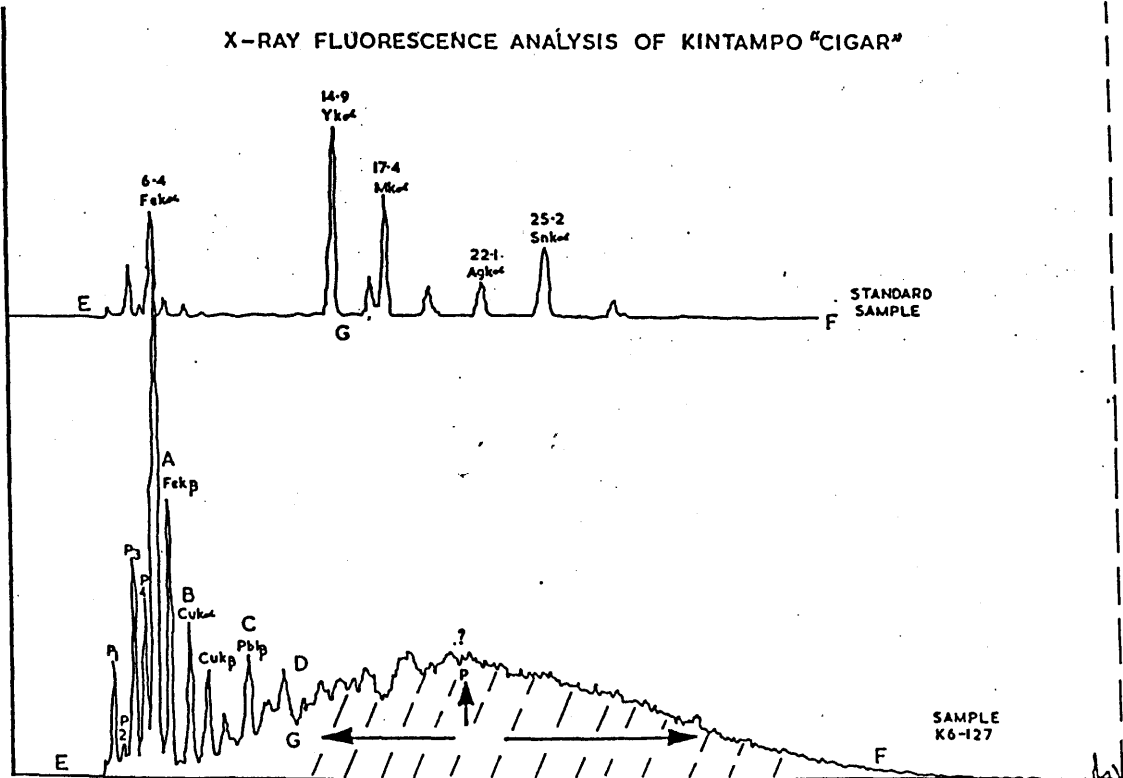


Fig.3

X-RAY Fluorescence:

This examination was undertaken in order to find out the main metallic minerals in the a cigar sample from the Kintampo K6. site. The examination was conducted in the X ray fluorscence laboratory of the University of California with the help of Mr. Dokyol Lee a doctoral student at the time and Mr. Peter Chen a Laboratory Assistant of that department at the time.

As the chart shows (Fig.3) the piece of "Cigar" contains a considerable quantity of iron (Fe) and small quantities of lead (Pbl) and copper (cu). The specific proportion could not be determined as there was no standard for calibration. There result also indicates the presence of clay minerals (see the bulge in the middle of curve between G. and F. The iron content in the sample did not put the material of which it was made into any class more than it puts it into the clay group.

However, as mentioned earlier textural changes observed along the margins of the sample seem to indicate differential firing which further supports the view that generally the "Cigars" seen to be clay objects that were baked after tempering with sandstone material thus giving the hardness of MOH 3.0 and the textural appearance of sandstone. This generalization is backed by the fact that the sandstone predominates at the sites from which the objects have been driven, in the Kintampo area.

On the basis of the result of the above characterisation one cannot compare the "Cigars" to the so-called "Letter" or "message" sticks (Roth 1906) that are of wood, or to bone stamps from the U.S.S.R. (Senenov 1964) which are similar in form and surface treatment. But can one on the basis of the similarities assume they were for the same function? The hardness of the wood may rule this out. Roth (1906) does not provide names of the types of wood from which the "message" sticks were made. The question of the uses or function of the terracotta cigars is a subject that this report does not intend to discuss.

The above characterisation was done as part of a course work and much of it was done with the support and assistance of the Laboratory of the Engineering Department U.C.L.A. to whom I am very grateful. Prof. William Knapp encouraged this exercise, but I am responsible for any problems related to interpretations of the results.

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