

AKYEM TE: THE TECHNOLOGY AND SOCIO-CULTURAL SETTING OF THE ABOMPE BAUXITE-BEADMaking INDUSTRY, GHANA

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Drawing primarily on data obtained from recent research at Akyem Abompe, Ghana, this paper examines the technology and socio-cultural setting of a stone-beadmaking industry in the forest zone of Ghana. Preliminary ethnographic observation of the industry not only reveals that it is community-based, but that it also interacts in a complex way with other local crafts in the village. The production process and marketing of the beads are discussed, as is the antiquity of the industry.

INTRODUCTION

Akyem te, meaning "stone from Akyem land," is the expression used by the Ga-Dangme, the immediate southern neighbors of the Akyem people, to describe bauxite beads made by Akyem Abompe beadmakes. Bauxite beadmaking is one of the extant ancient crafts in the Akyem Abuakwa Traditional Area in southeastern Ghana. I have been engaged in the study of ancient craft industries among the Akyem people since February 1991. This paper presents the results of preliminary research on the beadmaking industry at Akyem Abompe, including its organization, technology and socio-cultural aspects. It also surveys the archaeological and oral historical evidence concerning the antiquity of the industry.

THE AKYEM PEOPLE

The Akyem of southeastern Ghana are an Akan-speaking people organized into three paramountcies (*aman*): Akyem Abuakwa, Akyem Kotoku and Akyem Bosome. Like their other Akan ethnic-group members, the Akyem are recognized by a number of distinctive cultural traits. Linguistically, they speak Akyem, one of the major dialects of Akan (Dolphyne and Dakubu 1988:52). They also have a

common custom of naming their offspring from a set of names according to the weekday of birth. Every Akyem belongs to one of eight exogamic matrilineal clans or *abusua*. They have a centralized political system in which paramount chiefs (*amanhene*), queen mothers (*ahemaa*), divisional chiefs (*ahemfo*), and a number of sub-divisional chiefs (*adikrofo*) and their family members (*adehye*) constitute the ruling elite.

The present concern is with the Akyem Abuakwa people who, before British colonization in the 19th century, comprised a powerful state. They occupy a semi-deciduous forest zone characterized by moderately grouped lofty trees with a matted undergrowth (*see* Hall and Swaine 1981:19). Today, except in the forest reserves where indiscriminate felling of timber and farming are prohibited by the national government, large portions of the original forest have turned into secondary forest, characterized by climbers, shrubs and soft woody plants.

The subsistence of the Akyem Abuakwa people revolves around agriculture. Farming produces a variety of staple crops such as plantain (*brode*), cassava (*bankye*), cocoyam (*mankani*), yams (*bayere*), maize (*aburo*), and such vegetables as tomatoes (*ntoosi*), peppers (*mmako*), okra (*nkruma*), onions (*gyeene*) and egg plant (*nyaadewa*), all for household consumption. Citrus fruit (*ankaa*) and tree crops like kola (*bese*) and oil palm (*abe*) are also cultivated. Cocoa was once an important cash crop. In the past, gold mining was the principal economic activity in Akyem Abuakwa (Addo-Fening 1976:33-39). Other economic activities include the hunting, trapping and gathering of wild forest resources, as well as the raising of livestock and traditional crafts. The craft industries use some forest products for basketry and bauxite for beadmaking.

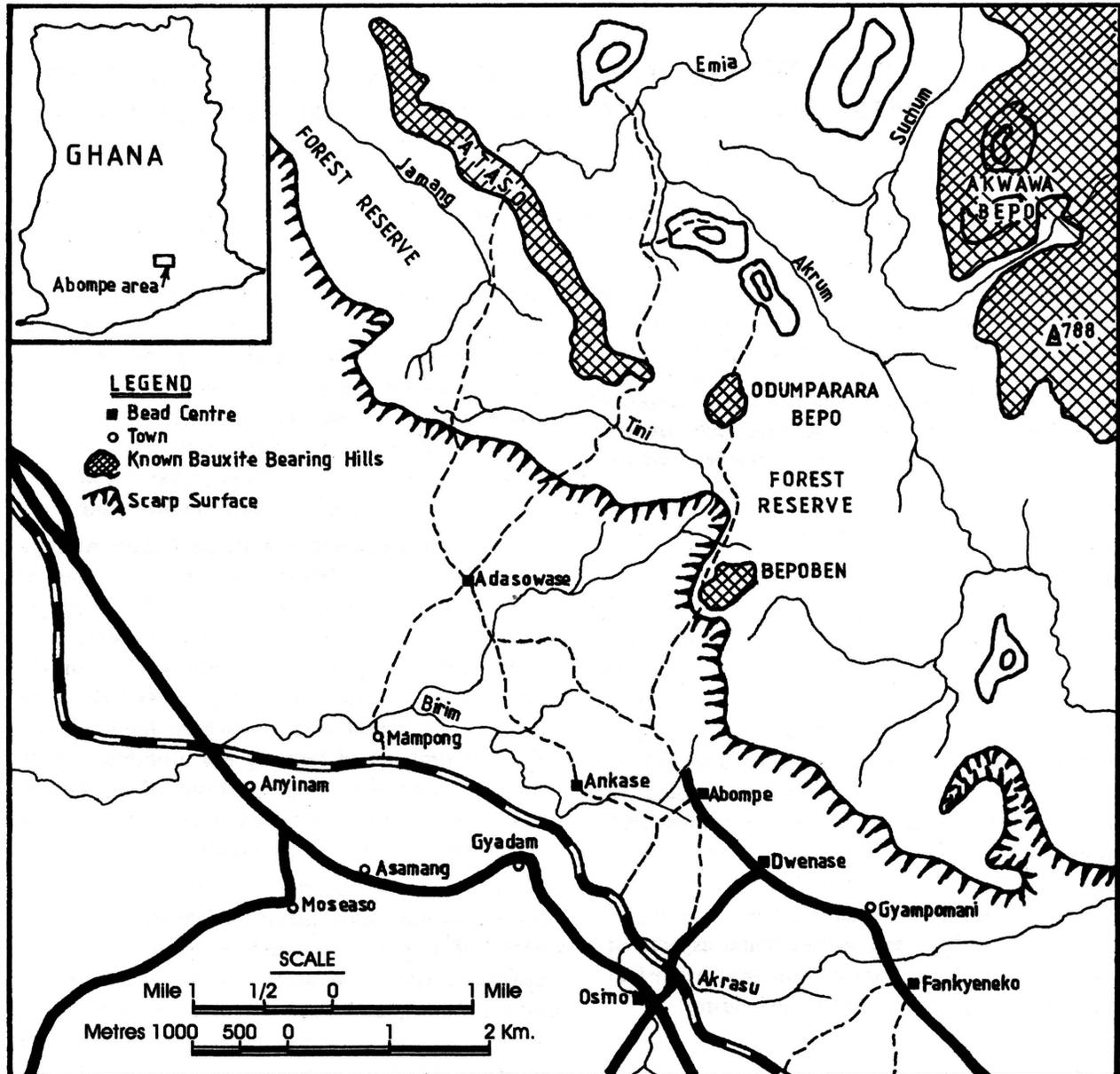


Figure 1. Map of the Akyem Abompe area showing the beadmaking centers and bauxite-bearing hills (drawing: Armah-Tagoe).

BAUXITE BEADMaking IN AKYEM ABOMPE

Beadmaking was quite commonly carried out in some Akyem Abuakwa villages in the past. The villages of Abompe, Adasowase, Ankase, Dwenase, Fankyeneko and Osino (Fig. 1) were once important

stone-beadmaking centers (Davies 1967:285, 1976; Shaw 1945:45-50). At present, the village of Abompe is the only remaining production center where beadmaking is still being carried out. Abompe is located in the foothills of the bauxite-bearing Begoro Plateau some 3.6 km north of Osino (Fig. 1).

Organization of the Bead Industry

The bauxite-beadmaking industry at Abompe is community-based. Comparative ethnographic data indicate that such industries are common worldwide and that they are vital components of the economies of contemporary ethnic societies (e.g., Anquandah 1992, n.d.; Bredwa-Mensah 1990; Crossland and Posnansky 1978). In this paper, I use the term "community-based industry" to mean any local craft industry which requires that 1) large groups of households specialize in it; 2) the extractive and productive activities of the industry be regulated through socially instituted mechanisms; and 3) a variety of complex economic networks link the industry with other associated crafts.

Bead production at Abompe is carried out on a household basis and the bauxite-bead industry involves almost every household in the village. The manufacturing processes may involve the combined efforts of members of each household. However, some beadmakers often engage the services of others to perform some tasks. The beadmakers consider some production stages, especially grinding and polishing, to be energy sapping and time consuming. Consequently, they—particularly the aged ones—employ paid labor to carry out these tasks.

Regulation of the mining and use of bauxite, the basis of the Abompe beadmaking industry, is the collective responsibility of the entire community. The bauxite mines are regarded by the villagers as their common property. Traditionally, the control of the land is rested in the village chief and elders. However, by customary law, every member of the village enjoys the right of beneficial use (*see* Akpaloo 1992:701-702). The mining of bauxite, for instance, may be performed by anyone from the village, though presently only a few young men engage in it either on a full-time or part-time basis.

The act of obtaining bauxite is linked to traditional religious practices. It is claimed that Bepoben (Red Hill) is the abode of the guardian spirit of the Abompe village. This spirit is also the custodian of the bauxite resources. To carry on operations at the mines, the workers first provide a drink of palm wine or schnapps to the chief and elders of the village which is to be given to the guardian and ancestral spirits. Taboos are imposed to regulate the mining of bauxite. Members of the village are forbidden to carry out any work at the

mines on Sundays and any other day declared sacred (*da bone*) by the indigenous calendar. Menstruating women are prohibited from going to the mines. According to local informants, these and other social sanctions are imposed to restrain miners from over-exploiting the bauxite resources.

The Abompe bauxite-beadmaking industry exhibits a complex interaction with other crafts in the village. The beadmakers depend on a number of specialized artisans for the supply of tools and materials. Two old men presently supply the beadmakers with knives, metal spokes and short iron bars. The demand for iron-tipped wooden drills by the beadmakers is met by two middle-aged men who have specialized in their production. A number of young men also supply, on request, sandstone or quartzite grinding stones. Raffia-fiber thread, needed for stringing the finished beads for market, is produced by some male farmers on a part-time basis.

Topography and Distribution of the Bauxite Resources

Bauxite, the beadmakers' raw material, is found in the geological deposits of the Begoro Plateau near Abompe (Fig. 1). The plateau forms part of the Akuapem and Togo ranges. The basic rocks that form these ranges are Upper Pre-Cambrian metamorphosed arenaceous, pebbly and argillaceous sediments represented by indurated quartzites, schists, hematic quartz schists, sericites, shales and phyllites (Bates 1962:52; Kesse 1985:12, 39).

The surface areas of the plateau represent the oldest and highest erosion levels. The surface has been strongly dissected, and deep, steep-sided valleys with swift-flowing rivers (like the Jaman, Birim, Emia, Suchum, Tini, Akrum and Akrasu) cut into the geological deposits. Above the general level of the plateau are flat summits over 600 m above sea level which represent ancient peneplain residual hills. Caps of lateritic-silicate bauxite of Tertiary age (Brash 1962:81; Dixey 1955; Junner 1946; Junner and Hirst 1946) occur on the flat hilltops. Among the best-known of the bauxite-bearing hills are Odumparara Bepo (Kitson 1917; Kesse 1985:153) and Bepoben (Red Hill) near Abompe, Ataso (Twin Hills) located near the Jaman River north of Adasowase

(Cooper 1936:7) and Akwawa Bepo (Geological Surveys of Ghana:4, Fig. 1).

The bauxite resources of Odumparara Bepo and Ataso have been exploited by the Akyem Abuakwa people for beadmaking. Today, as in the past, the stone required by the beadmaking villages is obtained from the ancient mines of these two hills. At present, mining is carried out only at Odumparara Bepo by a few young men from the village of Abompe. The hill, 700 m above sea level, is located in the Southern Scarp Forest Reserve, 6.5 km north-northwest of Abompe. A recent survey shows that the hilltop is densely dotted with ancient and modern mines and mounds of mining debris (see Kitson 1917). Thick forest undercover precluded precise mapping of the area.

The Nature and Method of Bauxite Exploitation

The bauxite from Odumparara Bepo comes in various forms. There are pebble-sized nodules locally called *nsaworowa*, large cobbles (*abopa*) and, occasionally, small slabs (*nsamsa*). The quality, too, is highly variable. The cobbles are coarse and earthy-looking or rock-like. The slabs, which are highly prized, are compact or fine-grained and clay-like in texture. The material is usually banded, with colors including white, gray, red, yellow, brown and purple.

The bauxite is recovered by pit mining. Six pits were in operation during the research team's visit in February of 1993. The miners comprised two crews, each made up of nine men.

The pits, measuring 1.8 m x 1.1 m, are open-mouthed and rectangular in shape. They are sunk to a depth of about five meters in some parts of the hill. The shafts may reach a lithomargic clay level that marks the end of the bauxite deposits at this depth. Lateral tunnels or underground side-workings are then dug to a distance of about four meters to exploit the bauxite. A tunnel cannot be too long because the shaft of a miner's neighbor may be located only a few meters away. All the inspected shafts had either three or four such lateral tunnels radiating from them.

The mining is performed using simple tools. These include a spade, a short handled pickaxe and a locally made iron adze head mounted longitudinally on a wooden handle. The shafts are dark and, as it is

impossible to work in a lateral tunnel without light, the miners carry small kerosene lamps (*bobo*) made of tin plate.

Footholds dug at almost regular intervals in the shaft walls provide access to the tunnels. A miner may get to the bottom of a shaft by planting his feet in the footholds while he leans back firmly against the opposite side of the shaft. He keeps his balance by pressing his hands firmly against the wall that supports his feet. This method is markedly different from that observed by Thurstan Shaw during a visit to the Akyem during the early 1940s. According to him, the mine pit was accessed by a ladder made of split bamboo poles (Shaw 1945:46).

The bauxite in each pit is mined by three workmen. One man digs while another loads the bauxite and mining debris into an old metal container, usually an abandoned bucket. The load is lifted out of the pit by the third man who is positioned at the edge of the shaft, pulling a tough bush rope tied to the container. The excavated material is heaped in small piles a short distance from the shaft.

The stone is sorted at the end of the workday. Chips are struck from the cobbles to determine quality. This process results in discrete scatters of rejected material and mining debris which usually form low mounds near the mine pits.

The selected material is stockpiled according to type. The miners sell it to middlemen who visit the mines on Tuesdays and Saturdays. Sometimes the miners and the middlemen enter into an agreement where the latter, after carrying a certain quantity of the bauxite to Abompe for the miner, return for the same quantity for themselves.

Bead Manufacture

The Abompe beadmakers may buy bauxite from either the miners or the middlemen. The technology for manufacturing the beads is simple and non-mechanized. The processes employed include chipping, drilling, grinding and polishing.

Chipping

As a first step in beadmaking, the large bauxite cobbles are split into convenient sizes. Depending on

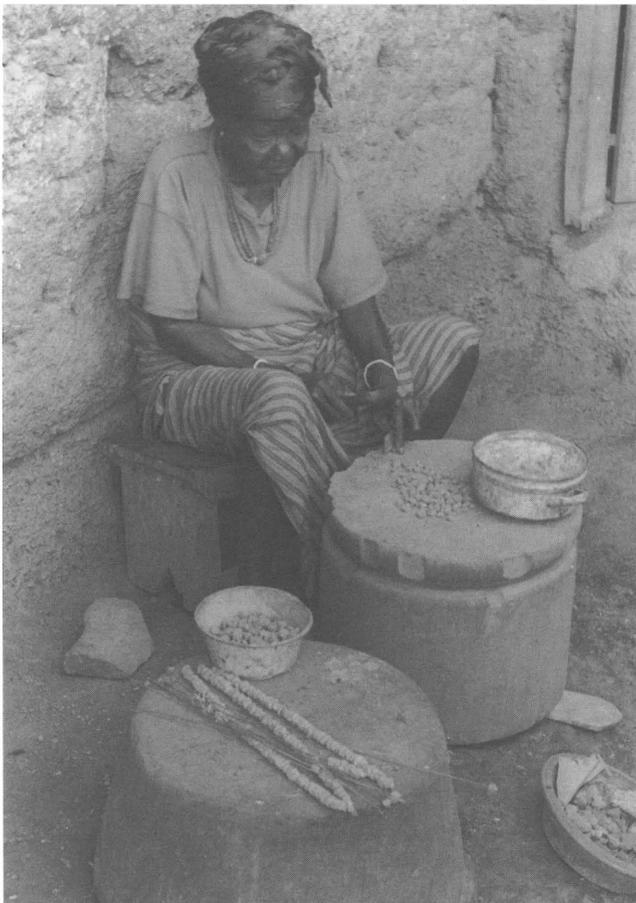


Figure 2. Chipping bauxite pieces into short disc beads at Akyem Abompe using the indirect percussion technique (photo: Bosman Murey).

its size, one of the resultant fragments may be chipped into one or more bead preforms or roughouts. Two principal chipping techniques are employed (indirect percussion and direct percussion) and their application depends on the type of bead to be produced. Indirect percussion is used in the manufacture of short disc beads (Fig. 2). The beadmaker places the split stone on a wooden anvil, usually a disused mortar (*wadufun*) or a piece of wood (*duasin*). A locally made knife (*dwidwa dade*) is positioned on the stone at the point where it is to be cut. The stone is firmly pressed on the anvil with the tip of the forefinger of the hand that holds the knife. The edge of the knife is then struck with an iron rod (*abosobaa*), thereby cutting through the stone.

Direct percussion is used to manufacture long tubular beads. In this process, the beadmaker firmly

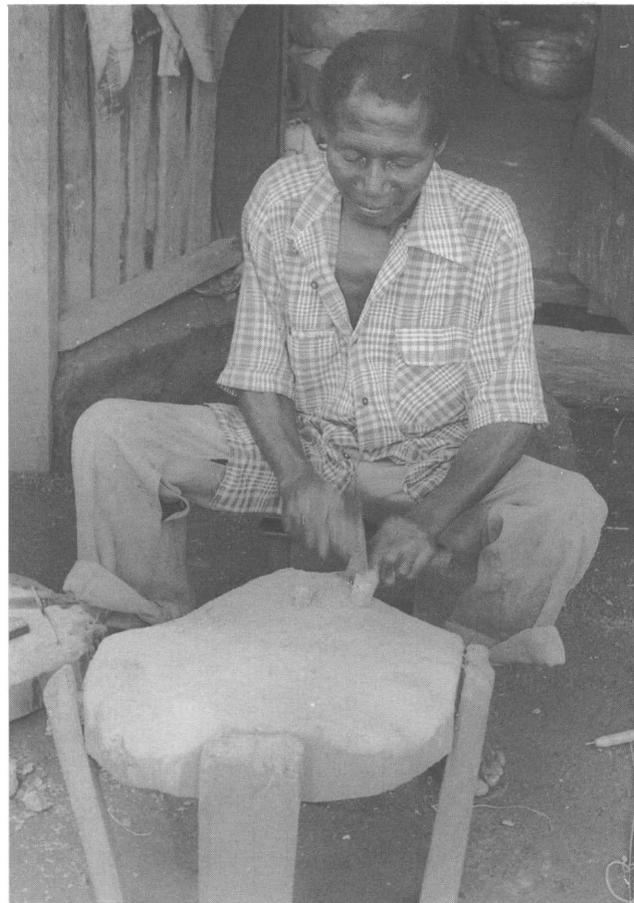


Figure 3. Chipping bauxite pieces into long tubular beads using the direct percussion technique (photo: Bosman Murey).

holds the split cobble on the wooden anvil with a precision grip. The cobble is rotated while being struck repeatedly with a long knife until the required form has been obtained (Fig. 3).

The resultant debitage is swept up every morning and dumped in large piles (Fig. 4). This is subsequently used to produce smaller beads. It was observed that beadmakers who produced small-sized beads went to the workshops of those who made large beads to scavenge raw materials from the chipping debris.

Drilling

Drilling is the next stage in the manufacturing process. At Abompe, the beadmakers drill beads using long bows (*tadua*) and spindle drills with scrap-iron points (*pane*). When Thurstan Shaw visited the mining

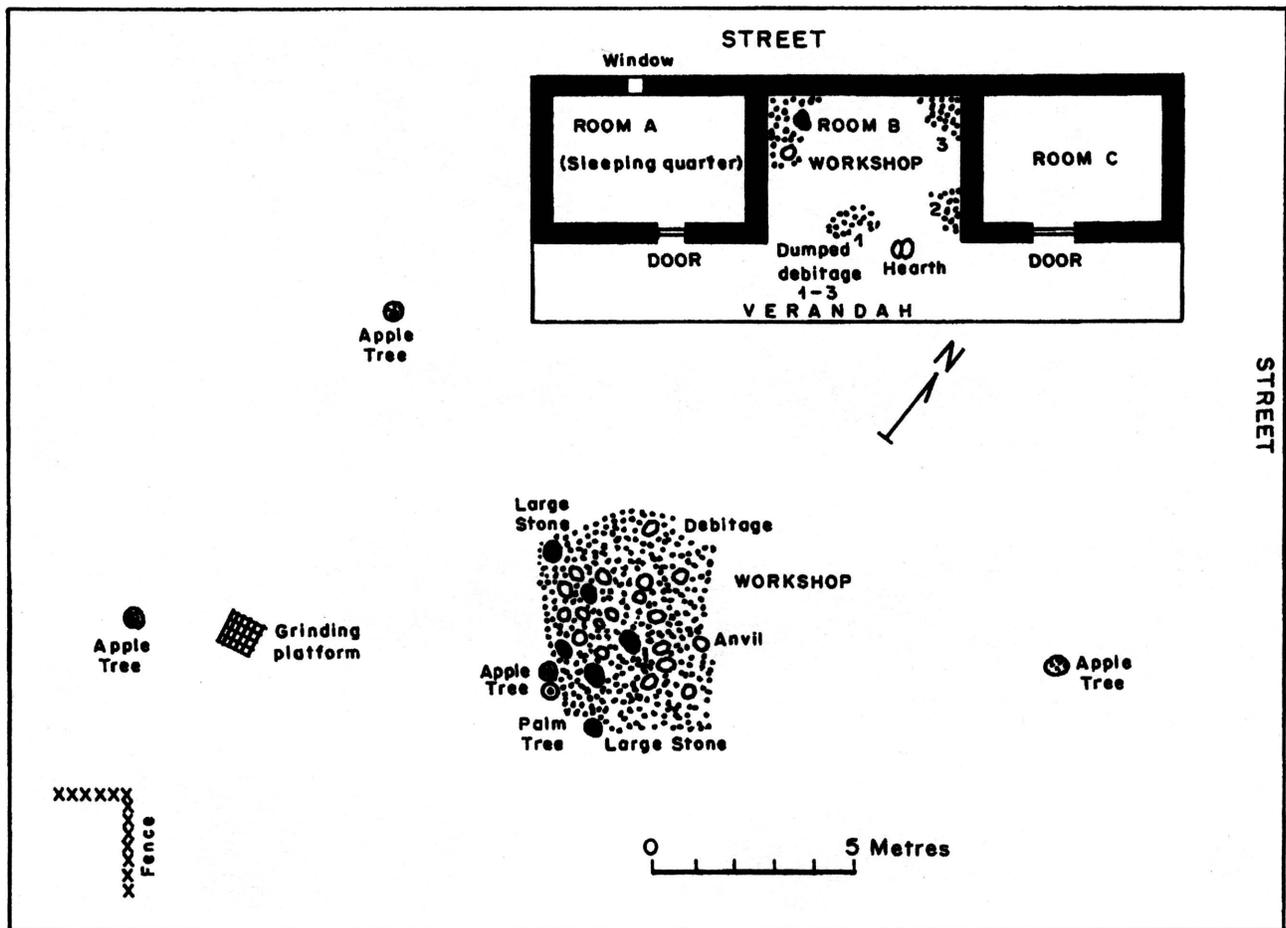


Figure 4. Ground plan of house D47 at Akyem Abompe showing the workshops, grinding area and debitage scatter (photo: Bosman Murey).

villages during the Second World War, the iron head of the spindle drill was made from a section of an umbrella spoke (Shaw 1945:47). Today, however, it is fashioned from the spoke of a disused lorry-tire rim.

The preform to be drilled is placed in one of several small, round holes situated at the edge of the wooden anvil. The bow thong is looped around the drill spindle and a cap usually made from a palm kernel is placed on the butt end of the spindle, enabling the beadmaker to exert pressure on it. A few strokes of the bow drive the drill through the preform (Fig. 5).

A small disc bead one centimeter or less in length is drilled from one side and the process may take less than one minute. On the other hand, a long tubular bead is drilled from either end, a process that takes a little more time to complete.

There is significant breakage during the drilling process due to flaws in the preforms and miscalculations in drilling. Thus, broken preforms exhibiting drill marks form part of the workshop debris that is swept up everyday and dumped in large piles (Fig. 4).

Grinding and Polishing

After the preforms are drilled, their edges are smoothed and shaped by grinding and polishing (Fig. 6). The preforms are first slipped onto a lorry-tire spoke, being firmly kept in place by small fruit nuts at the ends of the spoke. The beads are then rubbed back and forth on a hard grinding stone of sandstone or quartzite until the edges are evenly shaped. Some water scooped by hand is poured on the beads during grinding to speed the process.



Figure 5. Drilling bead preforms with the bow-drill (photo: Bosman Murey).

The ends of a bead are ground flat by fixing one end in a small wooden vice held in one hand and rubbing the exposed end back and forth on a grinding stone until the surface is smooth and even. The grinding area of a workshop is easily recognized by the presence of pink bauxite slurry produced during the grinding process.

The polishing of beads is a lengthy and painstaking process. It is akin to grinding except that water is not poured on the beads. Furthermore, fine sand is used as the abrasive.

After grinding and polishing, the finished beads are strung on raffia fiber in preparation for marketing.

MARKETING AND DISTRIBUTION

The bauxite beads of Abompe are traded throughout Ghana and her three immediate neighbors: Togo, Burkina Faso and Côte d'Ivoire. Itinerant art

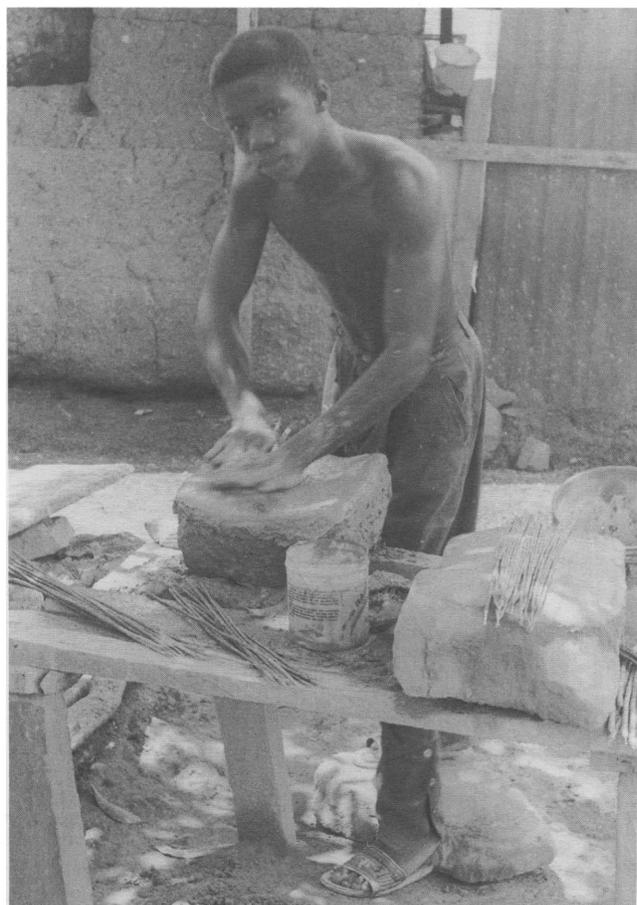


Figure 6. Grinding bead preforms mounted on lorry-tire spokes (photo: Bosman Murey).

traders carry the beads to other parts of Africa and the world. Beads likely produced in Abompe have been noted in Mali, Sierra Leone, Senegal, South Africa, Zimbabwe and the United States (DeCorse 1996: pers. comm.). Intermediary traders, predominantly women, travel to Abompe to buy for markets where the value of the beads is higher. Local markets in southern Ghana that serve as main distribution outlets include Accra, Akatsi, Kumase, Koforidua, Suhum, Krobo Odumasi, Somanya, Asesewa, Mankessim and Agomenya (Fig. 7).

Two main categories of bead products are purchased by the traders: finished beads and preforms. Finished beads command higher prices and are widely distributed. Preforms, on the other hand, have a lower value. The unfinished beads are bought by some local traders specifically for bead houses in Accra (Ga) and the Krobo areas. Here, Ga and Krobo bead dealers

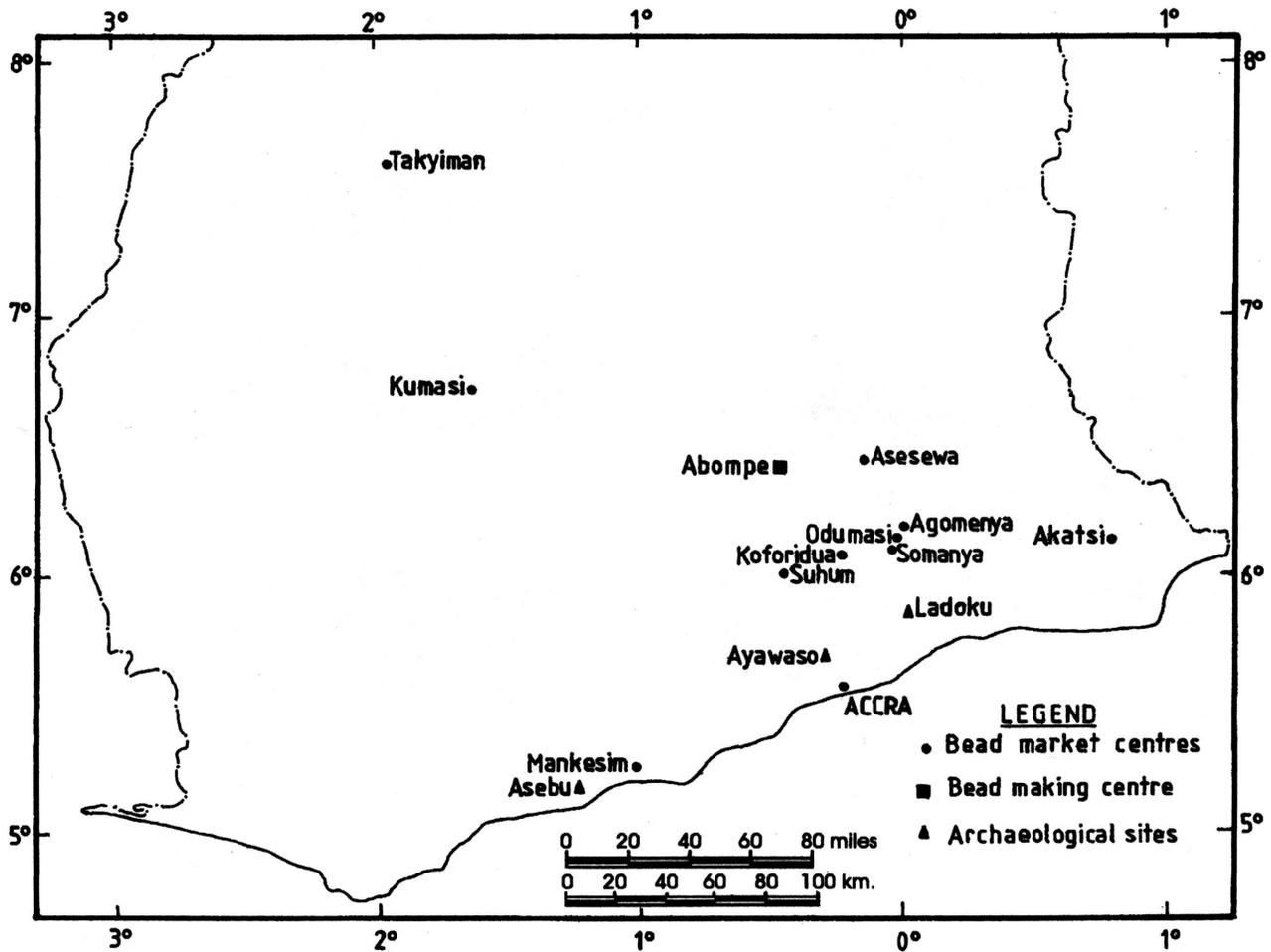


Figure 7. Map of southern Ghana showing modern bauxite-bead market centers and archaeological sites where bauxite beads have been recovered (drawing: Armah-Tagoe).

employ the same grinding and polishing techniques as used by the Abompe to produce finished beads. One such establishment is Teshie House in Accra where I observed Ga beadmakers grinding and polishing bead preforms purchased at Abompe.

BEAD TYPES AND SOCIAL CONTEXTS

The Abompe beadmakers produce five bead types (Pl. IIIC) which the local people classify on the basis of social function, shape and size (Table 1). It is not easy for an outsider to penetrate the classification scheme for the beads. In some cases, the scheme—which is not as simple as presented here—is diffused. For instance, the Abompe people refer to all waist beads, no matter

what their size or shape, as *asenemu*. At the same time, the extra large disc beads and the large and long tubular ones worn by adult females as waist beads are known respectively as *tompodie* and *teteaso*.

The beads play very important roles in the socio-cultural lifeways of the Akan-speaking Abompe people and their immediate neighbors, particularly the Ga and Krobo. In everyday life, men, women and children wear bauxite beads as body ornaments. Beads worn for this purpose are of varied designs and colors. They are visibly displayed around necks, wrists and ankles. Females may wear bauxite beads on one part of the body for a lifetime. For instance, females begin to use waist beads in early childhood and this use continues into adulthood.

Table 1. Types of Bauxite Beads Made at Abompe.

Type	Description	Function
<i>Asenemu</i>	Large/medium disc beads (Pl. Ia)	Waist beads worn by young and adult females
<i>Tompodie</i>	Extra-large disc beads	Waist beads worn by adult females
<i>Bakon</i>	Large/medium/small disc beads (Pl. Ib)	Wrist beads used by males and females
<i>Teteaso</i>	Large/medium/small long tubular beads	Wrist/waist beads used by males and females
<i>Konmu</i>	Medium/small disc beads (Pl. Ie)	Necklaces worn by males and females
<i>Nantu</i>	Small disc beads (Pl. Ic)	Ankle and calf beads worn by females
<i>Odaano</i>	Large/medium/small beads of various shapes (Pl. Id)	For lockets

The Akyem people call the bauxite beads *aboo* (meaning “stone”). A spoke-full of beads is called *abaa*. According to the beadmakers, three spoke-fulls make a girdle (*taban*). Between two to six girdles are worn by women around the waist (*asenemu*). It is believed that beads worn thus not only decorate the body but also help to shape and give it the round and oval feminine figure which signifies beauty in Akan society. Traditionally, it is a disgrace for an adult female to live without wearing waist beads. It is a common belief among male adults in the research area that waist beads worn by their female counterparts play a significant role in sexual intercourse by serving as a device to arouse passion. It is not surprising, therefore, that waist beads are a regular and constant feature in the daily lives of adult Akan females.

Special occasions demand the use of specific bead colors. During child-naming ceremonies, performed eight days after a baby is born, nursing mothers and their babies are adorned with white or gray bauxite beads. These colors signify newness, vitality and success in life in Akan social and religious contexts. A nursing mother may wear medium-sized white beads to express success in child delivery. The newly born baby

is also adorned with small-sized bauxite beads to signify its formal acceptance into the society.

At funerals, bereaved families and sympathizers wear red, brown or purple bauxite beads. These colors indicate a state of loss and mourning. The Abompe people have an expression, “*yereko we aboo*,” which literally means “we are going to chew stones.” According to the elderly people of Abompe, this means abstaining from food, the most reverential thing one can do to mourn the dead. The Abompe elders further explain that the earth (*Asase Yaa*) is the mother of all living things and so every living being that dies returns to the womb of the earth to be born again. Beads made of bauxite (a material obtained from the ground) are worn by the Abompe people at funerals to signify that the dead have gone to the original mother.

Traditional puberty rites performed to initiate young women into adult life are occasions for wearing bauxite beads. During such rites (*dipo*) among the neighboring Krobo, the participants are adorned with different types of beads, including those of red and brown bauxite. According to the Krobo, these colors signify maturity. Thus, young Krobo women wear the bauxite beads to show that they are mature and ready for marriage.

THE ANTIQUITY OF THE BAUXITE BEAD INDUSTRY

It is difficult to determine the precise age of the bead industry on internal evidence. Oral history only suggests that it is of remote antiquity. Thurstan Shaw (1945:50) assessed the age of the industry as follows:

Tradition suggests that it was already flourishing a century ago. The oldest people now living declare that the oldest people who were engaged in the industry in their youth found large digging pits already excavated, and this suggests a greater antiquity than a hundred years; but there seems to be no evidence to show whether 200 or 300 years or more would be nearer the mark.

On the basis of archaeological surface materials from Odumparara Bepo, where recent and ancient mines have supplied bauxite to make beads at Abompe, Davies (1967:285-287) has suggested that the industry may date back to medieval times. There is, however, some comparative material from dateable contexts in nearby regions. Excavations by R.B. Nunoo at Asebu yielded twenty beads from the first and second layers of site A. One bead type was made of bauxite. Through the association of imported European ceramics from the Rhineland and smoking pipes, he estimated that the site may predate the 18th century (Nunoo 1957:12).

Anquandah (n.d.), cited in Quarm (1989:6-7), also reported that archaeological excavations at the ancient Ga-Dangme market settlement of Ladoku yielded a total of 140 beads. Eleven of these were fashioned from various stones, namely bauxite, agate, quartz and carnelian. The site is assigned to the period between 1400 and 1700.

My research at the ancient Ga capital of Ayawaso also provided a number of beads. Seven of these were bauxite specimens recovered from stratigraphic layers dated between 1620 and 1680 (Bredwa-Mensah 1990).

CONCLUSION

Research at Abompe is still in progress. Nevertheless, through interviews and participant observation, vital information concerning various aspects of the local bauxite-beadmaking industry has been recorded. The research reveals that stone

beadmaking at Abompe involves several production stages, some aspects of which involve several households, and that the organization of the industry exhibits a complex interaction with other local crafts. It was also observed that chipping and drilling result in discrete scatters of debitage that accumulate in workshop areas despite the fact that the workshops are swept every day.

Bauxite beads feature prominently in the daily lives of the Abompe people and their neighbors. To them, beads not only serve as everyday ornaments, but also belong to the cultural realm; special occasions demand the use of specific bead types and colors. Thus, beads are used to communicate communal feelings concerning the various rites of passage.

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REFERENCES CITED

- Addo-Fening, R.**
1976 The Gold Mining Industry in Akyem Abuakwa c.1850-1910. *Sankofa* 2:33-39.
- Akpaloo, G.A.**
1992 State Policy and Community Land Tenure Systems in Ghana: A Symbiotic Co-existence? *Proceedings of the Commission of Folk Law and Legal Pluralism* 2:696-714. Victoria, New Zealand.

Anquandah, J.

1992 Accra Plains Dangmeland: A Case Study in the Eclectic Approach to Archaeological and Historical Studies. *Archaeology in Ghana* 3:1-8.

n.d. Accra Plains Dangmeland: A Case Study of Ethnoarchaeology and Iron Age Sites. Unpublished manuscript. University of Ghana, Department of Archaeology, Legon.

Bates, D.A.

1962 Geology. In *Agriculture and Land Use in Ghana*, edited by J.B. Wills, pp. 51-61. Oxford University Press.

Brash, H.T.

1962 Geomorphology. In *Agriculture and Land Use in Ghana*, edited by J.B. Wills, pp. 77-86. Oxford University Press.

Bredwa-Mensah, Y.

1990 An Archaeological Investigation Conducted at Okai Koi Hill (Ayawaso) and its Significance for Iron Age Archaeology in Ghana. Unpublished M.Phil. thesis. University of Ghana, Department of Archaeology, Legon.

Cooper, W.G.C.

1936 The Bauxite Deposits of the Gold Coast. *Gold Coast Geological Survey Bulletin* 7:5-7.

Crossland, L.B. and M. Posnansky

1978 Pottery, People and Trade at Begho. In *The Spatial Organisations of Culture*, edited by I. Hodder, pp. 77-89. University of Pittsburgh Press, Pittsburgh.

Davies, O.

1967 *West Africa Before the Europeans*. Methuen and Company, London.

1976 Ghana Field Notes: Part 4, Southern Ghana. University of Ghana, Department of Archaeology, Legon.

Dixey, F.

1955 Erosion Surfaces in Africa: Some Considerations of Age and Origin. *Proceedings of the Geological Society of South Africa* 58:265-280.

Dolphyne, F. and K. Dakubu

1988 The Volta-Comoe Languages. In *The Languages of Ghana*, edited by K. Dakubu, pp. 50-90. Kegan Paul International, London.

Geological Surveys of Ghana

1928-29 Annual Report. *Report of the Director of Geological Surveys of Ghana*. Government Printing Department, Accra, Ghana.

Hall, J.B. and M.D. Swaine

1981 *Geobotany: Distribution and Ecology of Vascular Plants in a Tropical Rain Forest*. Junk Publishers, London.

Junner, N.R.

1946 Progress in Geological and Mineral Investigations in the Gold Coast. *Bulletin of the Gold Coast Geological Survey* 16.

Junner, N.R. and J.R. Hirst

1946 The Geology and Hydrology of the Volta Basin. *Memoir of the Gold Coast Geological Survey* 8.

Kesse, G.O.

1985 *The Mineral and Rock Resources of Ghana*. Balkema, Rotterdam.

Kitson, A.E.

1917 *Annual Report of the Gold Coast Geological Survey*. Government Printing Department, Accra, Gold Coast.

Nunoo, R.B.

1957 Excavations at Asebu in the Gold Coast. *Journal of the West African Science Association* 3(1):12-36.

Quarm, K.D.

1989 The Use of Beads in Selected Contemporary and Traditional Ghanaian Societies as Illustrated through Ethnographic, Historical and Archaeological Evidence. Unpublished B.A. Long Essay. University of Ghana, Department of Archaeology, Legon.

Shaw, T.

1945 Beadmaking with a Bowl-drill in the Gold Coast. *Journal of the Royal Anthropological Institute* 75:45-50.

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