BAUXITE MINING AND BEAD PRODUCTION IN GHANA

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Abompe is the current bauxite beadmaking site in Ghana and the hills of the Kwahu Plateau above the village are pocked with hundreds, perhaps thousands, of pits dug in search of the raw material. To determine the age of the beadmaking industry in the region, people in Abompe and other villages were interviewed and related stories that suggest the first beadmakers were following the example of people in or around Bepong, a village on the plateau above Abompe. Three areas of bauxite pits on the Kwahu Plateau were investigated to see if there was physical evidence of ancient mining; those currently used by Abompe people and those previously dug by Bepong and Adasowase people. Four boulders with polished upper surfaces were found in the Abompe mining area and are believed to represent large-scale bead polishing. Caves where miners occasionally stay overnight were explored and evidence of bead production in the form of chipping waste was found. Pit counts by transect at Odumparara Bepo, the Abompe mining area, suggest the presence of possibly as many as 4,700 pits. These appear to have been created in the past 100 years.

INTRODUCTION

Bauxite is an impure aluminum oxide formed by intense tropical weathering of silicate rocks such as granite, gneiss, and basalt. Percolating rainwater dissolves more soluble elements leaving behind primarily iron and aluminum ores. The iron oxides give the stone a color that can vary from cream through light pink to brown, red, and purple. Bauxite deposits occur in many forms: soft and structureless or hard. Often, as on the Kwahu Plateau, the bauxite minerals form nodules by accretion. Pisoliths are larger nodules, typically over 1 cm in diameter, and these are used to make beads.

The nodules are misshapen and flawed, the outer surface being uneven. Good beads are made from the core. Unfractured nodules are particularly prized for beadmaking as they can be made into larger, more highly prized beads. The beadmakers distinguish between the most common bauxite and this finer *nsamsoa*.

Bauxite occurs throughout West Africa from Guinea to Nigeria. Three other bauxite-producing areas have been identified for commercial production in Ghana: at Atewa, a forested hilltop above Kibi in southwestern Ghana, at Awaso in western Ghana, and at Nyinahin, west of Kumasi.

Bauxite beads have been found in archaeological contexts that date to the 1620-1680 period at the ancient Ga capital of Ayawaso (Bredwa-Mensah 1990, cited in Bredwa-Mensah 1996-1997:20). Whether the areas of current bauxite mining on the Kwahu Plateau (Figure 1) could also have been the source of the bauxite forming the beads found in archaeological contexts remains unknown. Kwahu and Kibi are some 100 km north of Accra, while Awaso and Nyinahin are over 200 km to the northwest. Mount Agou in Togo, which is currently a potential site for commercial bauxite mining, is less than 200 km to the northeast. There are also bauxite deposits in Nigeria.

The bauxite beadmaking currently taking place in Ghana is located at Abompe, in Ashante-Akyem (*see* cover; Plate IA). The villagers find stone for the beads by digging pits on the Kwahu Plateau some two-hours climb above the village (Figure 2). It is likely that this community has been making beads for over one hundred years and it is possible that beadmaking or bauxite digging has been taking place in the area for a longer period. Bauxite is the fourth principal source of income for the area following cocoa, coffee, and plantain (Coyle 2008).

Supported by an award from the Guido Scholarship Fund of the Bead Study Trust, I set out to bridge the time gap, collecting oral evidence about the history of bead-making in and around Abompe and examining the bauxite-mining area on the mountaintop above the town for evidence of ancient beadmaking.

ORAL EVIDENCE

In 1945, Thurstan Shaw (1945:45) stated there were six villages making bauxite beads: Adasowase, Ankase, Osino, Dwenase, Abompe, and Bepong. There were six pits in operation at the Abompe mining area when he visited. Bredwa-Mensah (1996-1997:14) found six pits and 18 people involved in digging there in 1993. In 2009, beads

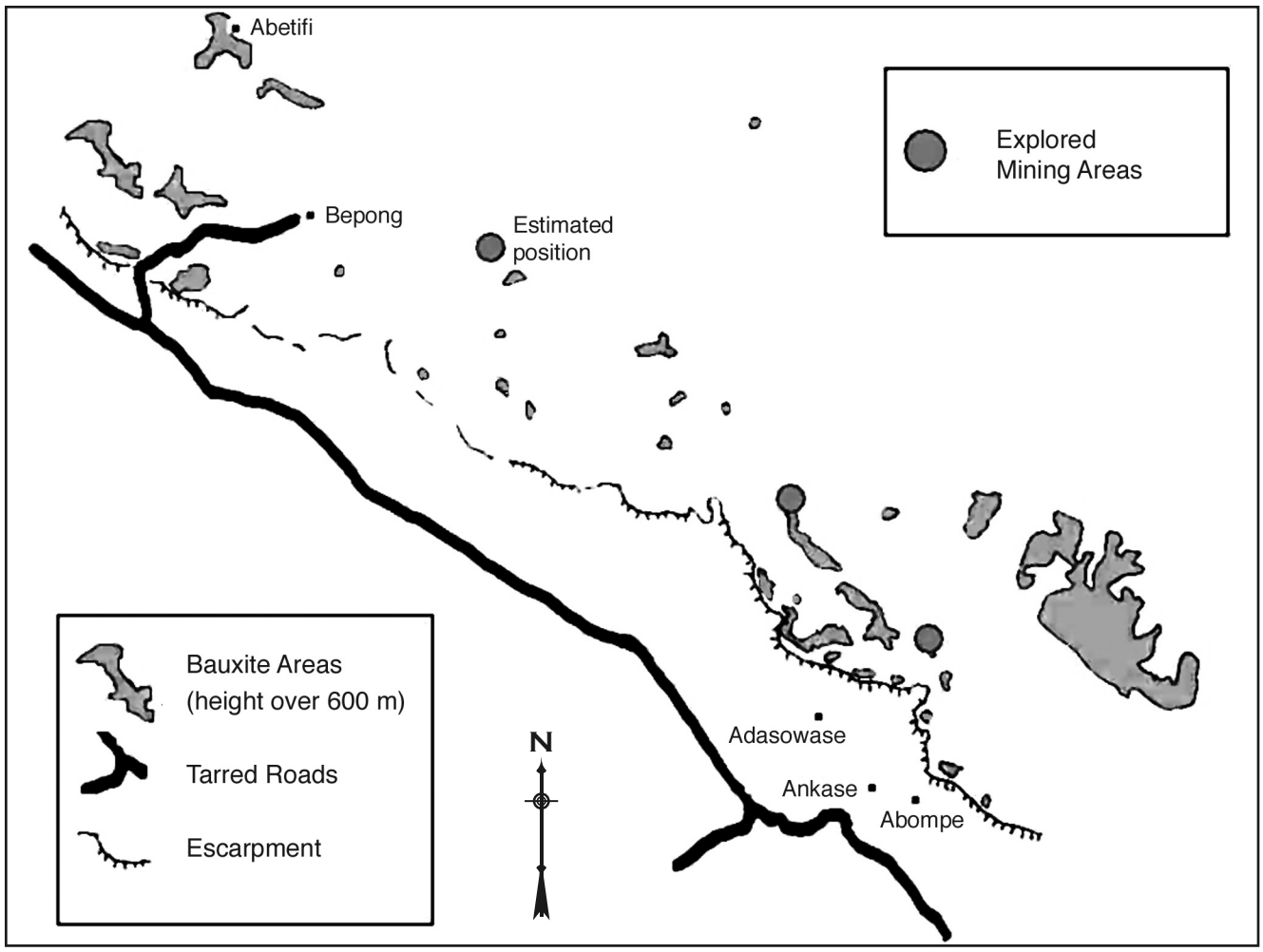

Figure 1. Possible bauxite-producing areas (over 600 m in height) and investigated mining areas on the Kwahu Plateau (all images by the author).

were only made in Abompe, there were only two miners, and only one pit was in operation.

To collect oral histories from the villagers about the bauxite-bead industry, an official approach was made through the regional chief at Kibi who is responsible for the Akyim traditional area. He wrote formally to three of these villages (Adasowase, Ankase, and Abompe) asking that they help. This resulted in interviews with the chiefs of these three villages or their representatives.

In addition, older beadmakers in Abompe were interviewed. These interviews were community led in that one person directed me to another in search of elders who had information and were the most interesting. The interviews were conducted in English or in Twi via a translator, Ben from Dwenase, a town two kilometers from Abompe, who had previously collected oral history about beadmaking for a visitor center in Abompe and is well known to the villagers.

Adasowase and Ankase chiefs and elders said their people no longer make beads and had no knowledge of the history, but an old woman in Ankase, the mother of the chief, gave a detailed explanation of the beadmaking process. Her husband, now dead, used to make beads, but she said no one has made them now for ten or twenty years. She explained how the beads were mounted on umbrella spokes for polishing, an interesting detail, since this is the method described by Shaw in 1945, though nowadays bicycle spokes or the wires found inside tires are used instead (*see* cover; Plate IA bottom). Members of both villages said Abompe would be the best source for information.

Interviews were conducted in Abompe in April 2008 over a period of five days. Some information had been collected previously and additional information has been left out where not directly relevant, though it may have helped establish the reliability of the information.

Figure 2. View of the escarpment from Abompe village.

Kweku Adu, Hunter

Kweku Adu was a 56-year-old hunter staying overnight in a cave on the mountaintop near the bauxite pit area (Koo Osei Cave). He said there were pits on the mountain "when I came, and when my father came, and my grandfather, and my great grandfather also."

Sam Ofori, Bauxite Digger

Sam Ofori and his partner are the only two bauxite diggers currently operating on the mountain. Sam has been digging pits for 25 years and says he digs 6 pits a year. In a previous interview, he said he dug a pit every month, maybe every two months. He has therefore dug over 100 pits. In his words, "The first man to mine on the hill was called Dowuana. Dowuana was the first man, the elder, the King, in Kwaming Asante's family."

Esther Afumaa, Abompe Beadmaker

Esther related that a town in the Kwahu region was the first place they made beads.

> A hunter who was from Obomeng or Bepong, and also from Abompe, brought the stone to Abompe to make beads. He was named Doku. He went to Bepong and found them making beads there. He came back and went hunting in the forest. He found that a tree had fallen down and in the soil below the roots he found bauxite which he brought home. He made beads like those he had seen in Bepong. After that he went to dig the bauxite and the hole collapsed so he was killed in the pit. The community members went to look for him and brought him back to bury him. He should have sacrificed a sheep or a goat to the ancestors, but because he did not, he died in the pit to serve as a sacrifice to the land. He taught some other people in the community so after his death they were still making beads.

Sobo Odogiemame Akosua Aku, Abompe Beadmaker

An Abompe beadmaker, Sobo Odogiemame Akosua Aku, related the following story:

> Two people went from Abompe hunting and found some bauxite there. When they went to the place

> they found a smoking pipe and a bracelet and waist beads. They told the Queen Mother who was Nana Darkwaa, and the elders, and asked what they should do. They were told nothing. And so they worked on it in the house, and it became a family business. And then the man was killed, the hole collapsed on him. They should have make a sacrifice but they had done nothing. If you find something like that in the old days, even if you just visit a place, you have to make a sacrifice as a form of thanks to the land and the ancestors. So the man was taken. They went there and found him and buried him. The other man who survived was called Nana Akokra Atta.

Ben, Guide from Dwenase

My guide Ben had been told the following information:

> Many years ago someone in Abompe wrote to the British Administration saying that the people just make beads, they don't do any work. So the government wrote to the village and told them to stop making beads and go to farm. And the Queen Mother stood up. She said she would not allow the government to stop the beadmaking. If she had to risk her life to keep them making beads, she would do it. So they went to the government. 15% of Abompe villagers stopped making beads and went to farm.

Opanin Kofi Asante, Former Abompe Beadmaker

Opanin (elder) Kofi Asante was born in 1923. He started making beads at five years of age and stopped in 2006. His father made beads before him and taught him.

> Adyaowo and Nano Akokrata found the beads. They were two brothers from the same family. They were hunters.
>
> In 1940 a Mr Asante, who was a forest surveyor, stopped the beadmaking. In those days the diggers who were from Abompe stayed on the hill top. If you wanted to buy stone from them you climbed the mountain to buy it. They had a small village, like a house, at the top. It was called Kobre. On several occasions he spent the night there. He even spent one Christmas. It was far from the cave (Koo Osei Bodan), close to the Adasowase boundary. The mountain is called Atta ne Atta So. There is a cave there, Atta ne Atta Bodan.
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> Abompe, Adasowase, and Bepong share the mountain, they share boundaries. Bepong had stopped making beads before he started. Bepong started making beads before Abompe. Each digs in their own areas.

Kwaming Asante, Abompe Beadmaker

Kwaming Asante is a 76-year-old beadmaker with a keen interest in history. On the floor in a corner of his workshop is a wooden bowl for gold panning which had belonged to his grandfather. On his workshop table, among the tools and tins of unfinished beads, are two stone axe heads (celts). He asserts that beadmaking was certainly ongoing before the Yaa Asantewaa War (1900).

> In the old days they would carry the beads for two weeks to market. They would walk on bush paths, to markets maybe in Koforidua or Nsawam. The beads were exchanged for salt. That was all that was needed in the villages [the nearby village now called Hemang was once called Fankyeneka: bring salt]. You could set a trap close to the house and get four or five grasscutter [a tasty rodent the size of a large rabbit]. Asante's grandmother was the queen mother who appealed against the ban on beadmaking. Some people threw their beads away rather than risk being found making beads and punished.
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> Begoro, Osino, Abompe, Hemang, and Otume people were all hunters. They were staying near the railway station [I interpret this as an indication of location, not suggesting that the railway was there at the time. Construction of the railway commenced in 1909, and the first train ran in 1923]. They had a quarrel and split up and went to found the present towns.
>
> Barfoo Nkansah was chief in old Abompe. He brought the people to their present location. The old village, Akurofoso ["old village"] was a kilometer away from the present settlement. People would come and raid the village stealing things, when the men were out at the farm. So they moved to be safer.

Nana Akobeahene and the Abusua Panin

After consultation with other village elders, this official history was related by Abusua Panin, the elder of the ruling family or head of the household, and Nana Ankobeahene, "the chief who stays at home."

> Two hunters went to the mountain and saw bauxite there. They brought it to the house to think of making beads. They were Opanin Atta Wuo and Atta Kuma. They grew old, and stopped making beads, and the industry collapsed. Later some young people started to make the beads again. They were Opanin Kotwum, Opanin Kosei, Opanin Apeasa, and Opanin Kwodjo Sekyeama. They were then making waist beads only.
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> The Abompe people had moved from the old village, Akurofosu, before they started making the beads. Osino, Adasowase, and Ankase people came to learn the beadmaking from Abompe. They formerly made the beads in Aboabo which is now a farm. The name is that of a nearby river, because the land is by the river. The cave is called Kosei cave. People would sit there making beads.

Comments on the Oral History

With regard to other stories collected in the community, the elders said that these came from young people who did not know anything. The elders knew nothing about beadmaking in Bepong.

The stories related in the village about earlier beadmaking may be seen as contradictory but could rather be considered as supplementary. They do not provide a definitive "factual history" but, rather, indicate possible histories to investigate. In three cases they suggest the Abompe people were not the first to make beads from bauxite, and in two, beadmaking is specified as already taking place in or around Bepong.

Supplementary information about the age of beadmaking in Abompe comes from research undertaken by Ben from Dwenase amongst all the current beadmakers in the village. Seven Abompe beadmakers claim to be the first generation of their family to make beads; four trace it back two generations; seven for three generations; and six have been making beads in their family for four generations.

BAUXITE MINING

Abompe Area

Abompe sits in a fertile valley of the gold-bearing Birim River. Above it rises a steep hillside with lower slopes of farmland merging into forest. Vertical cliffs protect the top of the 600-m-high escarpment which forms the Kwahu Plateau (Figure 3). The area on the mountaintop above Abompe is a forest reserve. People climb to collect snails, hunt small game, cut timber, and dig for bauxite, which is allowed in the forest. Now there is just one pair of miners who climb the mountain to dig for the brick-red, clumpy accretion. They bring a bucket or two of the raw material back to Abompe once a month. Each load, carried on the head (Plate IB top), weighs 35-50 kg but is only worth 10 cedis or about $10US on a good day (Coyle 2008).

Bauxite occurs as an undulating blanket capping the rock of the Kwahu Plateau. It is found 3-6 meters below the surface in a layer less than a meter thick composed of occasional nodules interspersed among the red laterite soil (Figure 4). Many mining pits remain clearly visible. They are deep with well cut sides that sometimes have clefts in them to serve as hand and foot holds. Older pits have collapsed and are merely evident as surface depressions. The pockmarked surface is quite characteristic.

Seasonal streams cross the plateau, most flowing east towards Lake Volta. Others flow westwards over the cliffs as waterfalls. The streams have cut through the horizontal strata of the bedrock, creating rock overhangs and horizontal clefts in the rock. The miners, and others, may stay overnight on the mountain in one of these caves or rock shelters. There are two caves en route to the Abompe mining area (Figure 5). The largest is a horizontal cleft known as Kosei, or Koo Osei, Cave no more than 1.2 m high, extending up to 6 m into the cliff face, and running for a length of 18 m (Figure 6). The cleft fronts onto a stream bed which in the rainy season can become a wide stream flowing over the cliffs to form the Tini Falls. In April, at the end of the dry season, it contains pools of water from recent rain. The water does not rise to the level of the cave, about 2 m above the bottom of the stream bed, even at the height of the rainy season.

This cave is used frequently and contains modern refuse such as foil medicine capsules, discarded flip-flops, bits of wire, and cloth. There are also utensils in the cave, such as cooking pots and boxes, which are left behind for others to use.

The floor of the cave is mostly solid rock, with an overlayer of dust. A vertical crack contains the bright pink/red chips characteristic of bead production to a depth of about 12 cm, topped by a gray layer, possibly ash (Plate IB bottom). This indicates that bead production had taken place here, though not recently. The amount of chips is roughly similar to what a beadmaking household in Abompe would build up in several years. No grinding stones or surfaces are present in the cave.

A mound of chips up to a meter high and a meter across, covered in vegetation and leaves, is situated at the mouth of the cave. Again, it indicates bead production at some time in the past, possibly over a period of several years by several people.

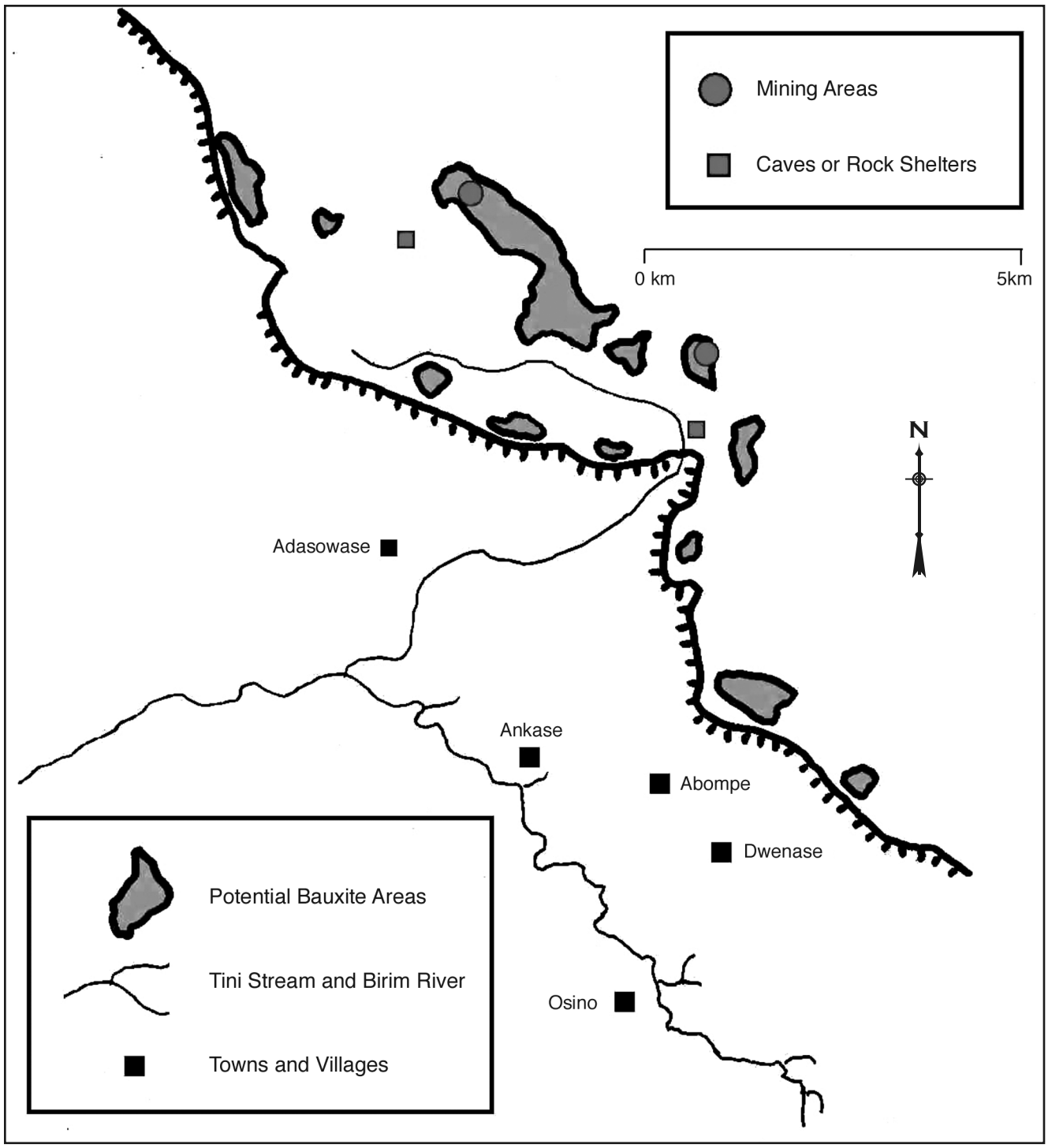

Figure 3. The location of past and present bead-producing villages and their mining areas and caves.

The second cave in the Abompe mining area is smaller and no more than a rock overhang further upstream. It contains pots and rubbish but no signs of beadmaking either in the form of chips from the shaping process or polishing surfaces.

Close to the path running between the two caves are four boulders that exhibit polished, concave areas on their horizontal upper surfaces which are situated a few centimeters above ground level. The concavities are of similar dimensions on all four boulders and consistent with

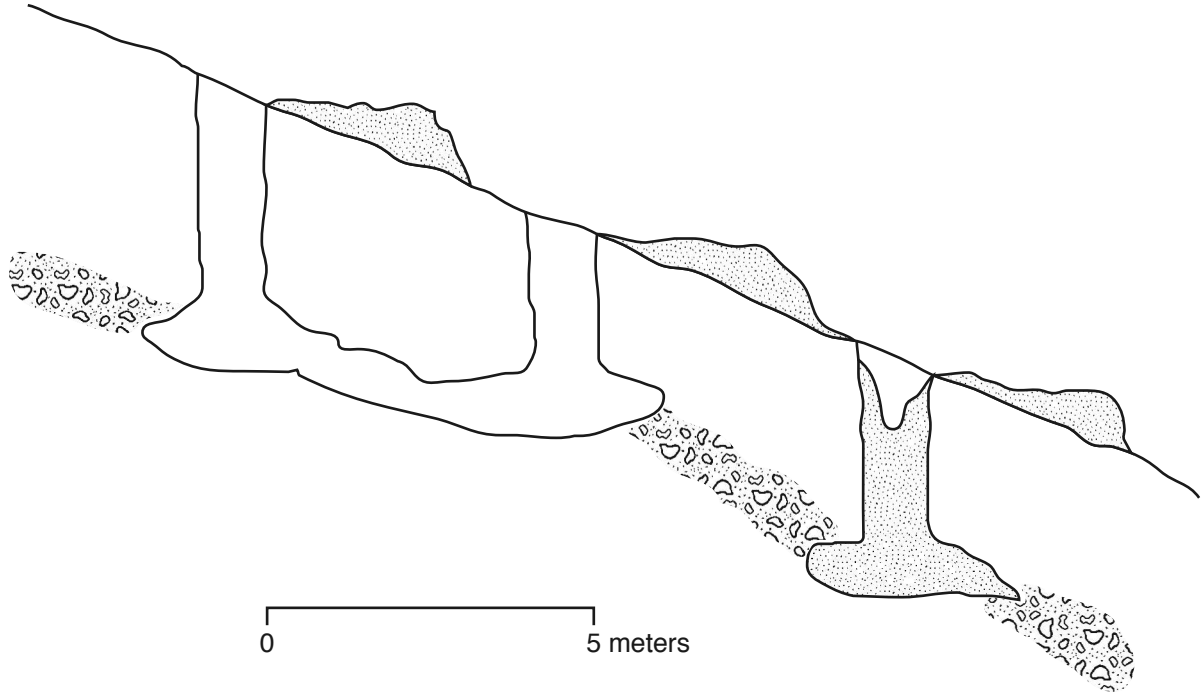

Figure 4. Diagram of typical mining shafts and bauxite-producing levels.

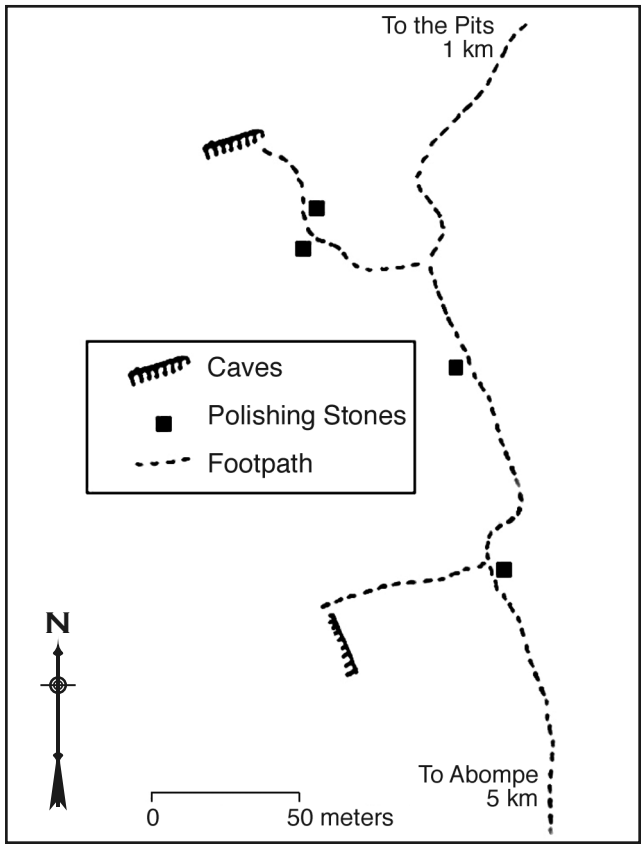

Figure 5. The location of caves relative to polishing stones.

bead polishing. They are not of the size and shape of the grooves created by either cutlass sharpening or the creation or sharpening of stone axe heads.

The first boulder, situated close to the small cave, has a 30-cm-wide polished area. The second boulder is 3 m from the first and has a 60-cm-long polished area (Plate IC top). The third pink rock shows three parallel grooves 55 cm long in a polished upper surface. Here pink and white strata running across the rock clearly show in contour form the three grooves.

Situated nearest the larger cave, the fourth and largest boulder, possibly a bedrock outcrop, had previously been walked past several times without being noticed as it was covered in leaves and moss. It is 4 m long and 1 m wide. About half the surface is polished and shows signs of work in a central area and towards one end, with one long edge and one end being rough-topped like the surrounding rocks. About 1.5 m from one end is a clear U-shaped depression, smooth and even, about 60 cm long and 40 cm wide (Plate IC bottom).

All the polishing rocks were on or beside current footpaths. The rocks were all covered with vegetation, typically 2.5-5.0 cm of leaf mold. On the polished rocks this was easily cleared because of the smooth surface. A search of the surrounding 10 m x 10 m area revealed many flat rocks but all with rough, unpolished upper surfaces. Apart

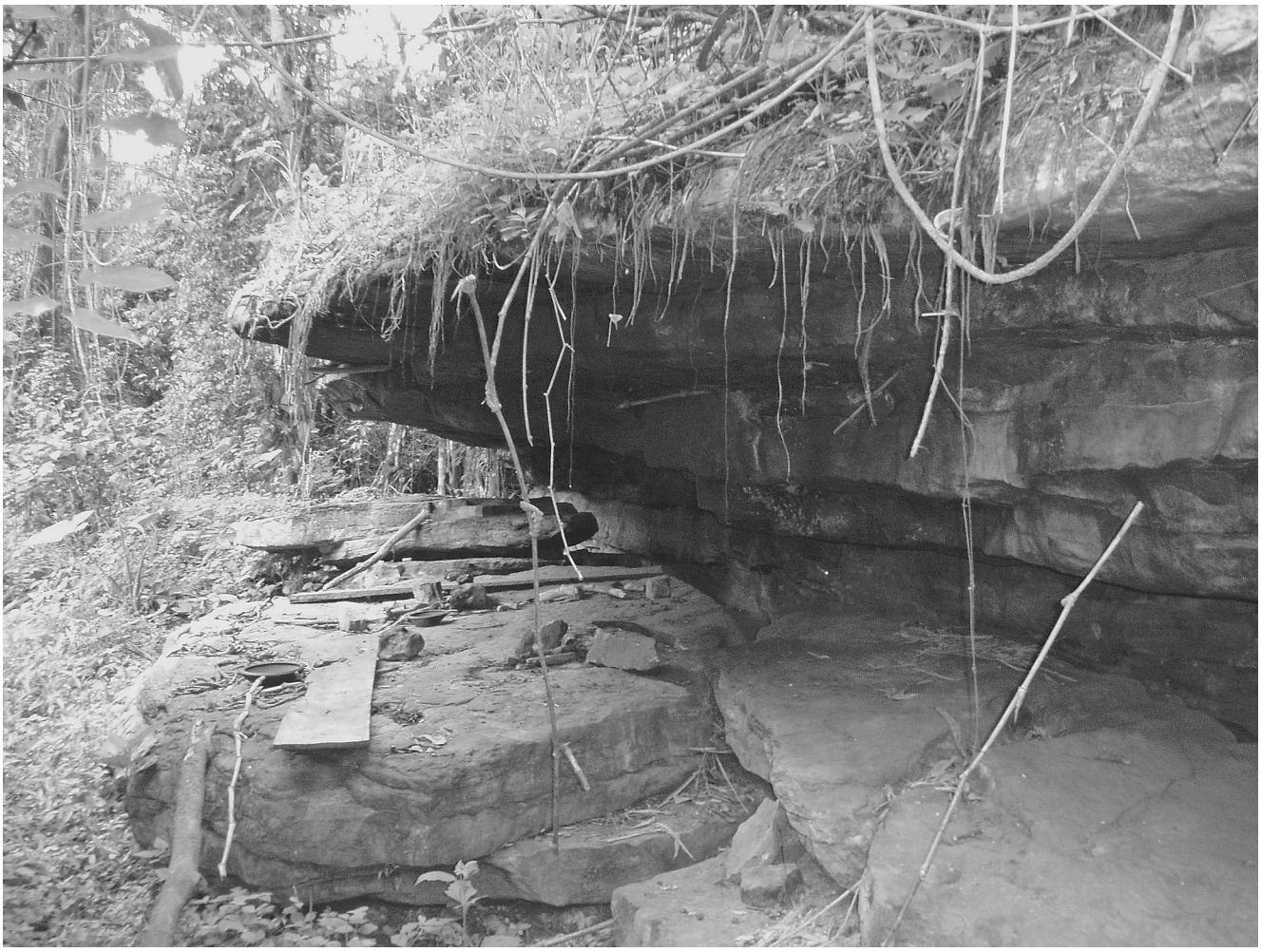

Figure 6. The rock shelter where hunters and miners stay overnight.

from the area of jumbled rocks, it was difficult to search further without a major effort to clear vegetation.

Adasowase Area

People from the nearby village of Adasowase take a different path to the mountain top and dig in another area. The path is very steep and extends beneath the cliffs before passing through a crack in the face and then there is a rocky scramble to reach the top. There was only one man who knows the way. He had visited there with his father who had worked on clearing and replanting part of the forest some 20 years ago.

Unlike the wild natural forest passed through on the way to the Abompe pits, with clear ground beneath giant trees, here there is an undergrowth of vines and brambles which had grown up since the forest had been cleared, allowing light to penetrate to the forest floor. There are no paths to follow, apart from the overgrown logging lanes, and it was necessary to cut a route through with cutlasses.

There are two caves–actually small rock overhangs–in the Adasowase area, called Kofi Nka Daban and Agya Nkansa Daban, respectively. A possible polishing stone is located between the two caves. Situated at ground level, its broad, polished, horizontal upper surface exhibits two grooves, narrower at 8 cm across than those found at the first Abompe site. This feature is ambiguous and may be a natural formation.

At the second cave, there is a large mound of bauxite chips measuring 4 m in diameter, and 1.5 m in height on the downward slope and 30 cm on the upward slope. A scatter of chips extends up to 3 m from the edge of the mound. Modern litter, such as pots, flip flops, snail shells, and quartz stones, is also present.

Bauxite chips were found outside both caves. The beadmakers of Abompe examined them and declared that the bauxite from the first cave was good, while that from the second was "dead," not good enough to work. No polished stone surfaces or grinding stones were found in or close to these caves though there were many flat rocks in the area.

The digging area is similar in appearance to that at Abompe with many collapsed pits and some open ones. According to my guides, the area covers about one hectare or 8,000 m^2. I looked over an area about 40 m x 40 m (1,600 m^2).

Bepong Area

On a visit to Bepong in 2008, I interviewed Opanin Yaw Donkor, aged 75, who remembered seeing his father making beads when the former was between 5 and 8 years old. He described the process and said they started mining in 1938 at Atta ne Atta So because customers had come from Nigeria asking if the villagers would make beads for them. Mining ceased in 1942-1943 when the demand stopped. Beadmakers came from several villages: Mpraeso, Atibie, and Asaka. His father, Opanin Kweku Esi, had built a house to work in. The area rang with the sound of many people chipping and polishing beads in those days. They used big stones to polish them–Opanin Yaw spread his arms wide. Some polishing stones were at a place far away, called Nana Amma Beposo.

A visit to an area of pits on a hill called Ahanta revealed 100-200 pits, as well as the site of a house which had stood there for the beadmakers. Opanin Yaw estimated there were 400-500 pits within an area of 4 hectares.

The Extent of Mining

One way of assessing the possible age of bauxite mining and beadmaking in the region is by determining the number of pits. Sam Ofori and his digging partner have dug 6 pits each year for 25 years. They currently acquire enough stone to supply 24 beadmakers in Abompe. They said that in the past there were up to 30 or 40 pit diggers working on the mountain. This implies that anywhere between 6 and 120 pits could have been dug each year, with 500 beadmakers in Abompe, Dwenase, and Ankase. Thus, depending on the work force in any given year, as few as 600 and possibly as many 12,000 pits could have been dug during the period covered by the living memory of the Abompe community; i.e., since around the beginning of the 20th century.

In an attempt to determine the actual number of pits in the Abompe mining area, a transect was run through the area. This was 230-250 m long by GPS reading, accurate to +/-20 m at each end, and 340 paces by foot or an estimated 220 m. Two people independently counted the pits on either side of the transect to an average distance of 10 m depending on visibility. Thus the area examined was between 4,440 m^2 and 5,000 m^2. The total number of pits recorded by the survey group ranged from 156 to 190. Rounding off the lower figure to a conservative 160, this suggests that there is a pit for every 23 m^2 to 32 m^2 of horizontal ground surface.

Shaw (1945: 45) observed that horizontal tunnels could extend up to 4 m from the vertical shaft. Sam's most recent pit (Plate ID) has a tunnel 5 m in length connecting it to another shaft, but this is unusual. There are no supports underground so the danger of collapse is increased by longer horizontal tunnels.

The mining pits can be envisaged as circular and closely packed, each with a vertical shaft at the center with one or more tunnels radiating out from it. The close spacing throughout the investigated areas reveals that the miners exhausted existing stone by digging close to previous pits, while ensuring the shafts are not so close as to be weakened. This was seen in both the Abompe and Adasowase mining areas, and later, near Bepong.

Pacing the distance between Sam Ofori's most recent pits gives a distance of 6-10 paces or about 4.0-7.5 m. An average shaft-to-shaft distance of 6 m is consistent with the transect estimate. Based on this distance, there is a pit for every 36 m^2 of horizontal ground surface. The whole hilltop area above 600 m of this particular Abompe digging site, Odumparara Bepo, covers approximately 150,000 m^2. Using the low-end density transect estimate of 32 m^2 per pit suggests that there could be up to 4,700 pits on the plateau. Miner Sam believes the pit area would take 2-3 hours to walk around, but this is not a good quantitative guide. It was not possible to explore the entire hilltop because of thick undergrowth, so it is possible that some areas may not have been mined, but an area of about 16,000 m^2 separate from the transect area was traversed and contained closely packed pits. Using the estimate of 32 m^2 per pit suggests that this could contain 500 pits. Over 700 pits have therefore been counted and there may be several thousand pits on the entire hilltop mining area.

CONCLUSION

The bauxite mining areas currently being worked on the Kwahu Plateau may contain several thousand pits, but all of

these could have been produced in the past hundred years. No evidence was found for mining or beadmaking activity prior to the 20th century. Furthermore, there is no reason to assume an unbroken mining tradition at Abompe dating back to the first miners. The plateau has many potential areas where bauxite could be mined. Knowledge of bauxite mining and working could have been passed on from one community to another. Equally, mining could have been stopped and restarted by the same people at different times and places, or by different peoples at the same places.

The existence of polishing stones and debris close to the mines confirms that while pits collapse and become overgrown, other evidence of mining remains. This suggests that traces of earlier mining, that might have preceded bauxite mining and beadmaking at sites such as Ayawaso, could still be evident elsewhere.

Oral evidence suggests that beadmaking took place elsewhere in the area before Abompe started its industry and confirms that the age of the Abompe settlement is relatively recent. It may be that beadmaking was previously carried out atop the escarpment by Kwahu people who settled the area before the Akyem.

Abompe is a relic of historic bauxite mining and working. Other areas on the plateau may contain mines made by communities that have since moved on. Further investigation may reveal traces of ancient mining and the extent of historic bauxite production in the region.

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