Archaeological Excavations at gi: A Preliminary Report on the First Two Field Seasons

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Introduction

gi is a circular pan which lies approximately seven kilometres north of the Aha Hills and one kilometre east of the border between Botswana and Namibia (Fig. 1). The pan itself normally holds water for less than half the year and is dotted with shallow depressions excavated in recent times to provide water for stock after the surface water disappears. In 1968 we observed a mixture of Middle Stone Age (MSA) and Late Stone Age (LSA) stone tools in the backdirt from one of these shallow pits on the eastern edge of the pan. Trial excavation confirmed the presence of an extremely rich stratified sequence of cultural material. Between late November 1968 and mid-August of the following year, an area of 72 square metres was dug to an average depth of two metres and during a second field season which extended from October 1975 through July 1976 a further 172 square metres were uncovered. During the latter field season however, a high ground water level resulting from unusually heavy rains prevented excavation to comparable depth. This work is part of an ongoing project, and we plan a further four-month field season in 1977. At the present time analysis of stone tools is not yet complete, and the results from the Carbon 14 dating are still unknown. Faunal remains excavated in 1968-69 have been analysed by Mr R. Welbourne of the Department of Archaeology, University of the Witwatersrand, but similar work on the much larger series collected during the second field season is still in progress. Thus because our excavations, as well as our analysis of already collected materials are incomplete, we can present only general and tentative results at this time.

To date, our excavations have revealed an extremely rich, open air, MSA living floor situated on the edge of the gi pan: a geomorphological feature which dates from pre-MSA times and persists today. This extensive MSA floor exhibits considerable vertical concentration with over 90% of the remains falling in a single 10 cm level or immediately above or below it. Cultural material is in its primary context: lithic artifacts are unrolled and faunal remains - some of them quite delicate - uncrushed. By southern African standards these MSA remains are incredibly rich and single two metre squares may yield in excess of 1500 pieces of stone, bone and tooth. As for the lithic material, the proportion of retouched pieces is extremely high. Disturbance from the few 'wells' dug along the edge of the pan is insignificant, and virtually the entire floor remains protected in a soft clay well below a thick hardpan or calcrete layer. Because the culture layer lies below, rather than in the calcrete band - this is rarely the case in southern Africa - it offers the unique combination of overall richness, excellent preservation and ease of excavation. Although dense surface scatters of similar materials have been observed elsewhere in Botswana, gi stands unique for the reasons discussed above. Thus far, no human remains have been found.

Well above the calcrete layer, and thus clearly separate from its MSA counterpart, an LSA occupation horizon has also been exposed. The LSA materials are equally varied, in situ and well preserved. What distinguishes this layer and makes it unique is its varied bone industry, (unknown elsewhere in Botswana), in association with a series of pits which contain kudu, rhinoceros and other remains.

The Extent and Method of Excavation

In 1968 and 1969 we excavated in five-foot square units to open an east-west trench 70 ft. × 5 ft. in length, running directly perpendicular to the pan, and a north-south trench 60

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ft. x 5 ft. which roughly paralleled the pan’s eastern margin. Additional test pits (Fig. 2) were aligned along the axes of these two trenches to establish the eastern and southern limits of the cultural remains. When work recommenced in 1975, we followed the rest of Botswana and shifted from the English to the Metric system. Our basic excavation units now became squares, two metres on a side. We selected a datum point, constructed north-south and east-west axes through it, and assigned square designation on the basis of the distances of the north-west corner of a square from each of these axes. During this second field season, 43 of these two metre squares were excavated to varying depths.

Because the calcrete layer is essentially sterile, we were able to safely speed its removal and substitute force for finesse. In 1968-69 we used picks, rock chisels and hammers; in 1975-76, these were replaced by a two stroke Atlas Copco Breaker, which served our needs quite well. Above and below the calcrete, we used trowels to expose individual pieces, each of which was examined and returned to its place for measurement. All faunal remains, cores, retouched pieces of stone and other items of particular interest were numbered and their distance from the north and west walls of the square and their depth below datum recorded. Only "debitage," or unretouched trimming flakes were left unnumbered. The position of each piece of debitage however, was plotted per 10 cm level and all debitage bagged separately by square and level. We screened all excavated dirt to recover those few small pieces which escaped the excavator's eye. Faunal remains were then pieced together, treated with preservative and shipped to the University of Witwatersrand for analysis. All other numbered artifacts, as well as samples for radiometric, geological and palynological analysis, have also been sent (with the Botswana Government’s permission) to the Smithsonian Institution on loan for detailed analysis.

**Topography and Geology**

Around most of its circumference, the edge of the $\emptyset$gi pan is poorly defined and marked primarily by the appearance of surface calcrete deposits. This calcrete or hardpan forms as a single sheet but rapidly becomes cracked and then further weathered and rounded as grass and small bushes force their roots into the interstices between the blocks. On the east side of the pan, however, the rim is well defined, and this area is raised between 50 centimetres and one metre above the ground level of the rim elsewhere. This raised area is covered with a relatively well-developed soil horizon, ca. 20-30 cm. thick. A series of hardpan layers lies beneath this surface horizon. Extensive grass cover is apparent in this area during the rains while largely absent elsewhere because of the exposed hardpan.

While our excavations on the east side of the pan have revealed variation in stratigraphic particulars from spot to spot, due in large measure to the uneven way in which calcrete formation has occurred, the same general sequence holds throughout the area. Tony Brink, a geologist, visited the site in April 1970 and summarised the succession as follows (see Fig. 3):

a. Surface to ca. 35 cm.: black to dark grey dry firm sandy clay-silt with well to poorly developed columnar structure with roots. Exothermic reaction on hydration. In some areas grades in depth to light grey. Beneath this, in some areas, is a 10 cm thick layer of dry light grey stiff but friable shattered slightly clayey calcareous silt with scattered irregular hard calcrete fragments, representing a calcified pan deposit.

b. Ca. 35-40 cm to ca. 75-100 cm below surface: hardpan calcrete in places degraded to powder calcrete. Resolution and discontinuous redeposition forms crust 1 inch thick in middle of layer.

c. Ca. 75-100 cm to ca. 125-150 cm: dark grey blotched white to light grey shattered calcareous clay silt with irregular hard limestone fragments. Some vein quartz, chert, quartzite and chalcedony gravels in matrix. Main MSA layer. At base of this level, ca. 135-150 cm is thin transitional zone of coarse to fine gravel with some scattered MSA material. Bottom of MSA sequence is marked by dry white medium dense intact alluvial sand with scattered fine to medium gravels. (At ca. 150 cm.)

d. ca. 150 cm to ca. 250 cm: coarse medium to fine gravels and boulders well-rounded, mainly calcrete pebbles and boulders but with scattered vein quartz, chert, chalcedony, in
PAN W. NGAMILAND, BOTSWANA

Maximum natural depth ca. 1.50 meters below datum (B.D.)

Dry season water hole

L.S.A and M.S.A. levels excavated 1968 through 1976

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\[\text{FGI: REPRESENTATIVE SECTION THROUGH ARCHAEOLOGICAL DEPOSIT}\]
matrix of alluvial white sand as above (base of (c)). 'Silcrete' pebbles locally absent. Lower part of unit contains very large boulders (Kalahari conglomerate). Some rolled and some fresh artifacts – possibility of Early Stone Age?

The 'd' sediments, which are clearly alluvial, indicate the presence of an active stream which flowed through gi prior to the formation of the pan and the subsequent MSA occupation. While it is unclear whether climatic change or tectonic activity is responsible for the termination of this fluvial regimen, we suspect the latter as the cause. Certainly the former cannot be assumed a priori to play the primary role. The fine grained 'a-c' sediments which form the matrix for the cultural material are a pan-fill, most likely colluvial in origin, which have been subjected to varying degrees of leaching and calcium carbonate deposition. It is purely by chance that this calcrete band formed, and in places is still forming, between the MSA and LSA layers, thus protecting the former and providing a convenient stratigraphic marker which separates the two. In some areas, this hardpan is fresh and unweathered; in all likelihood it has never been exposed to the surface. In other places however it exhibits a characteristic pattern of cracking and edge-rounding indicative of just such exposure. Thus, at least once in its geological history sediment removal did take place, and it remains to be determined whether clear cut episodes of deflation and deposition can be established and whether climatic inferences can be made. During our 1977 field season, a geologist will concentrate on these questions. It appears, incidentally, that fossil pollens, excellent indicators of past climate, are not preserved in these highly alkaline deposits.

The Middle Stone Age

With the exception of the four outlying test squares, Middle Stone Age (MSA) remains have been recovered in all excavated areas of the site. What impresses one most about them are their extreme abundance and very marked vertical concentration. One two-metre square (48S 8W) located just north of Yellen's original east-west trench has yielded about 300 stone tools (scrapers, points, notched pieces, perforators, denticulates, outils écailles and the like), a similar number of faunal remains, mostly teeth of large herbivores, and over 1 000 pieces of debitage. The cultural remains are concentrated with over 90% of the tools located within 30 cm from top to bottom. The bones and teeth appear localized at the top of the culture layer.

The lithic industry clearly falls within the general heading of "Middle Stone Age" as defined by A.J.H. Goodwin (1928), although the specific feature of faceted striking platforms is rare in the gi MSA industry. The principal tool types are bifacially and unifacially retouched, small to medium-sized (up to 60 mm.) points as well as pointed flakes with convergent dorsal scars. Side-scrapers on flakes are also numerous as are notched scrapers, denticulates, variously retouched flakes and splintered pieces (outils écailles). Perforators and bees have also been found. Cores are frequently in the form of small discoids, often showing a clear evidence of preshaping of the last removal. Large bifacial core tools, such as hand-axes, cleavers, picks, axes or adzes, etc. are completely absent as are microliths or backed tools of any sort. No human remains or colouring materials have been found to date. On the basis of point typology, among other features, this industry would appear to fall within the limits of the old 'Stillbay' cultural stage, although the utility of this concept is in considerable doubt owing to the lack of well-excavated materials from the area of the type site.

Analysis of the faunal material collected during 1975-76, when completed, will considerably expand our understanding of the environment around gi in MSA times as well as the way in which man fit into it. The great majority of these remains was excavated during this latter field season and is now being studied by Mr R.G. Welbourne. Welbourne also analysed the 1969-70 series and noted the presence of the following species:

a. Extinct species
   Equus capensis, Giant zebra.
   Phacochoerus aethiopicus. Cape wart hog (note: this same species extant elsewhere).
Homoioceras bainii. Giant Buffalo.
Alcelaphus sp. (cf. helmei). Extinct giant haartebeest.

b. Living species
Ceratotherium simum. White rhinoceros.
Connochaetes taurinus. Brindled gnu.
Antelopini sp.
Giraffa camelopardalis. Giraffe.

On the basis of this species list, there is no evidence that the environment at ≠gi during the MSA was substantially different from that of the present day. Modern relatives of all species noted above, except the rhinoceros which was hunted to extinction in this area in the twentieth century, have been observed near the site.

Dating of the MSA at ≠gi as indeed of the MSA in southern Africa as a whole has become problematical in the light of recent new dates for 'MSA' materials from East Africa (Wendorf, et. al., 1975). As recently as five years ago, (Clark, 1970, e.g.), the MSA was considered to begin around 38 000 – 40 000 B.P. and to end around 10 000 B.P. New radiocarbon dates from southern Africa, however, (Vogel and Beaumont, 1972) suggest that the main development of MSA is older than 40 000 years and lies beyond the effective range of Carbon-14 dating. Furthermore, direct association of MSA in the southern Cape Province of South Africa with raised beaches dating back to the last interglacial (=Eem) over 70 000 years ago (Klein, 1974a, Wymer and Singer, 1972) tends to confirm an expanded and earlier chronology for this phase. It is increasingly probable that the MSA of southern Africa is comparable in age to the Middle Paleolithic (Mousterian) of Europe which it more closely resembles typologically and technologically, rather than to the Upper Paleolithic.

During our 1975-76 excavations we collected samples of bone (all the faunal material is unburned and only miniscule amounts of charcoal are present) for radiometric dating, and the chronological placement of the MSA at ≠gi will rest primarily on this base. At the present time, however, we must draw our inferences on the basis of faunal and lithic comparisons with more fully documented areas. And because of the great distance and environmental differences involved these comparisons are shaky at best. The MSA fauna at ≠gi is quite similar to that from the South African MSA site of Kalkbank (Dart, and Kitching 1958, Welbourne, personal communication. H.B.S. Cooke, (1967) has assigned it to the 'Florisbad-Vlaakral faunal span.' In all likelihood, this means it is (early?) Upper Pleistocene although in the Cape Province, as Klein (1974) points out, most of these same animals survived into the terminal Pleistocene. The closest typological counterpart to the ≠gi MSA lithic material comes from Redcliff in Rhodesia, and some specific kinds of scrapers (one with a dome-shaped edge and another with an acute retouched edge which is abruptly terminated by a perpendicular retouched at one end) find almost exact counterparts in the Redcliff MSA layers. At Redcliff, dates of 41 800 ± 3 000 and 40 780 ± 1 800 (Sampson, 1974) have been obtained from the MSA, and we believe these are the most reliable guides in the provisional dating of the ≠gi MSA.

The Late Stone Age

While Late Stone Age (LSA) materials have been recovered from all excavated parts of the site, their concentration is greatest in the area north of the East West trench. Like MSA counterparts, the material also displays a highly compressed vertical distribution and associated faunal remains are excellently preserved. Materials are clearly in their primary context and have not been transported in from elsewhere. The material is interesting from several points of view. First, little archaeology of any period has been carried out in Botswana, especially in the western sector. What material is available comes largely from surface collection, (e.g. Malan, 1950). LSA or 'microlithic' industries of the area are therefore no better known than the MSA industries. Secondly, the abundance of features and faunal material allow us to study man-animal relationships as well as spatial patterning within the site. Finally, the apparent conti-
nuity between the LSA at ≠gi and the San (Basarwa) living in the same area today, means that we can use their knowledge of the world around them in our attempt to understand the past LSA ways of life.

The lithic industry is identical, in all essential respects, to that described by Malan (1950) from /xai /xai and by Yellen (1971) from the !Kangwa valley. Both tools and debitage indicate that a presumably local silcrete in the form of river cobbles served almost exclusively as raw material. Both cores and all removals from them are quite small, and the industry is based on a blade technology. Because of its ‘microlithic’ size and the presence of numerous crescents, the label of ‘Wilton’ may be applied to it although the utility of this term, like that of the term ‘Stillbay’ is in question. The most characteristic tools include simple and ‘double’ crescents, crescents with a convex retouched edge opposite the backed side, elongated, bilaterally backed bladelets which presumably served as drills, duckbill scrapers, awls and a wide range of retouched flakes and blades which may be classed as side and end scrapers. Thumbnail scrapers are extremely rare and no polished stone implements have as yet been uncovered. Excavation also has yielded a series of worked bone pieces which may be either arrow points or linkshafts which attached the point to the arrow. To the best of our knowledge these are unique in Botswana and compare most closely to LSA artifacts from Amadzimba Cave in the Matopo Hills. Other cultural remains from ≠gi include worked cowrie shells, copper, iron and ostrich egg shell beads as well as pottery and iron fragments.

Several features including a small hearth and a shallow pit are clearly associated with the LSA occupation. Most interesting however are three pits extending along the edge of the pan which had been excavated from an old LSA occupation surface through the hardpan into the MSA, partially removing it. The edges of these pits and the old LSA ground surface were readily definable, and the pits contained a wide variety of cultural remains as well as butchered animal bones. The most spectacular of these latter are a nearly complete kudu horn as well as half a mandible and humerus and ulna fragments from a white rhinoceros. There are three prime possibilities as to the possible fraction of these pits. Game blinds are built by Basarwa today near the edge of the pan and are used for night hunting during a very limited time of the year. The LSA pits may have served the same purpose although their depth, up to two metres, argues against this. They may also have been dug as small wells to tap underground water which is caught by the underlying bedrock after the pan itself had dried. There is, however, no ethnographic or ethnohistorical data which would support such an interpretation. Finally, one can use historic parallels to suggest that the pits functioned as game traps and that animals were driven into them. At the present time we lean towards this last explanation.

Included in the LSA fauna are remains of kudu, white rhinoceros, tortoise and a variety of antelope. A complete listing must await the conclusion of Welbourne’s analysis, but analysis to date suggests that the species represented, with the exception of rhinoceros, are present in the ≠gi area today. The climatic regimen inferred from geological evidence does not appear significantly different during the LSA occupation from the modern one.

Until the radiometric dates become available one must rely on comparisons with similar dated materials. One distinguishing characteristic of the ≠gi LSA assemblage is the relatively large number of ‘double crescents’ and on this basis it is quite distinct from the LSA collected by Cooke (1967) in the Nata River area and from a number of sites in the Matopo Hills. On the other hand, it falls in quite well with samples from the Brandberg in Namibia. Orabes Upper shelter includes significant numbers of such artifacts and Jacobson and Vogel (1975) date this occurrence to $180 \pm 45$ B.P. The ‘double crescent’ also characterises what Sampson (1974) terms the ‘Coastal Wilton’, and although the distances and environmental differences between the Northern Kalahari and Southern Cape are great, the lithic typological similarities cannot be completely ignored. Such Wilton material as illustrated by Burkitt (1928, Fig. XV) is closely duplicated in the ≠gi material. Dates for the Coastal Wilton range from the sixth millenium BC to the second millenium AD.
Conclusions

The very reasons which make #gi unique make a continued and complete excavation worthwhile. It is the first carefully excavated, stratified stone age site in Botswana and as such the information gained from it enormously extends our knowledge about the past human experience in Botswana and in the entire Kalahari basin. To the west the nearest published materials come from the Brandberg, to the north, from the Zambesi, and to the east from the Nata Valley. In the first two of these directions, the differences in environment are great and during the LSA, at least the Nata area ties in most closely to the culture of the Rhodesian Highlands rather than to points further west. Thus, #gi falls in a vast blank spot which presently includes most of Botswana. Also, because of the carefully controlled context from which they are excavated, the lithic and faunal materials themselves are valuable scientific materials which are the property of Botswana and will be housed in the National Museum in Gaborone.

The second thing which makes #gi unique is the well preserved MSA living floor which contains a variety of faunal and lithic materials, lies in a soft and easily excavated matrix of a clayey silt, and is capped with a protective layer of hardpan. In southern Africa such living floors are rare at best, and when they are found, usually lie embedded in hardpan. Thus, they are extremely difficult to excavate – materials must be removed with a hammer and chisel – and for this reason cannot be opened in their entirety. Because the MSA at #gi can be uncovered with relative ease, one can ask a whole new range of archaeological questions of the data. Because of the way activities are patterned on the ground, their spacing and distribution can reveal insights not only into the nature of the activities themselves but into the social organization of the people responsible for them. Thus, with luck and more complete excavation we shall gain a new and different insight into the lifeways of people who may have lived over 40,000 years ago. And for this reason it is important to excavate as much of the MSA layer as possible.

Because the LSA occupation at #gi most likely occurred in fairly recent times, and because relatively the same range of plant and animal resources is still found in the area today, the amount of potentially useful data we can bring to bear in our interpretations is quite large. To interpret specific aspects of the LSA occupation – the ‘pits’ for example – and how man fit into and utilised his environment, we can look around us, study animal and plant distributions and densities, examine their variation over time, and apply the results directly to the excavated material. And because of the great man-caused environmental changes in most parts of the world, such an approach is only possible in a few places, of which Botswana is one.

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