The Mumbwa Caves Project, Zambia, 1993-94

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Introduction

This is an interim account of excavations at Mumbwa Caves, Central Zambia (Figure 1) which began in 1993. The Mumbwa Caves Project follows a series of excavations which took place intermittently from 1925 to the early 1970s (Macrae 1926; Dart and Del Grande 1931; Clark 1942; Savage 1983). These earlier projects demonstrated the importance of Mumbwa as a source of stratified, in situ deposits with faunal and human remains, spanning the period from the Middle Stone Age (MSA) to the present. Despite the effort invested in Mumbwa, however, questions of chronology, environment and behavior still remained to be answered.

A fifth expedition to Mumbwa was therefore planned which would use science based dating and environmental analysis to construct an analytical framework and to assess the effects of Late Pleistocene environmental change on human behavior. The age and typological affinity of the basal assemblage reported by Dart and Del Grande (1931) was of particular interest. This quartz based assemblage consisted of a small number of retouched tools (nine scrapers, three

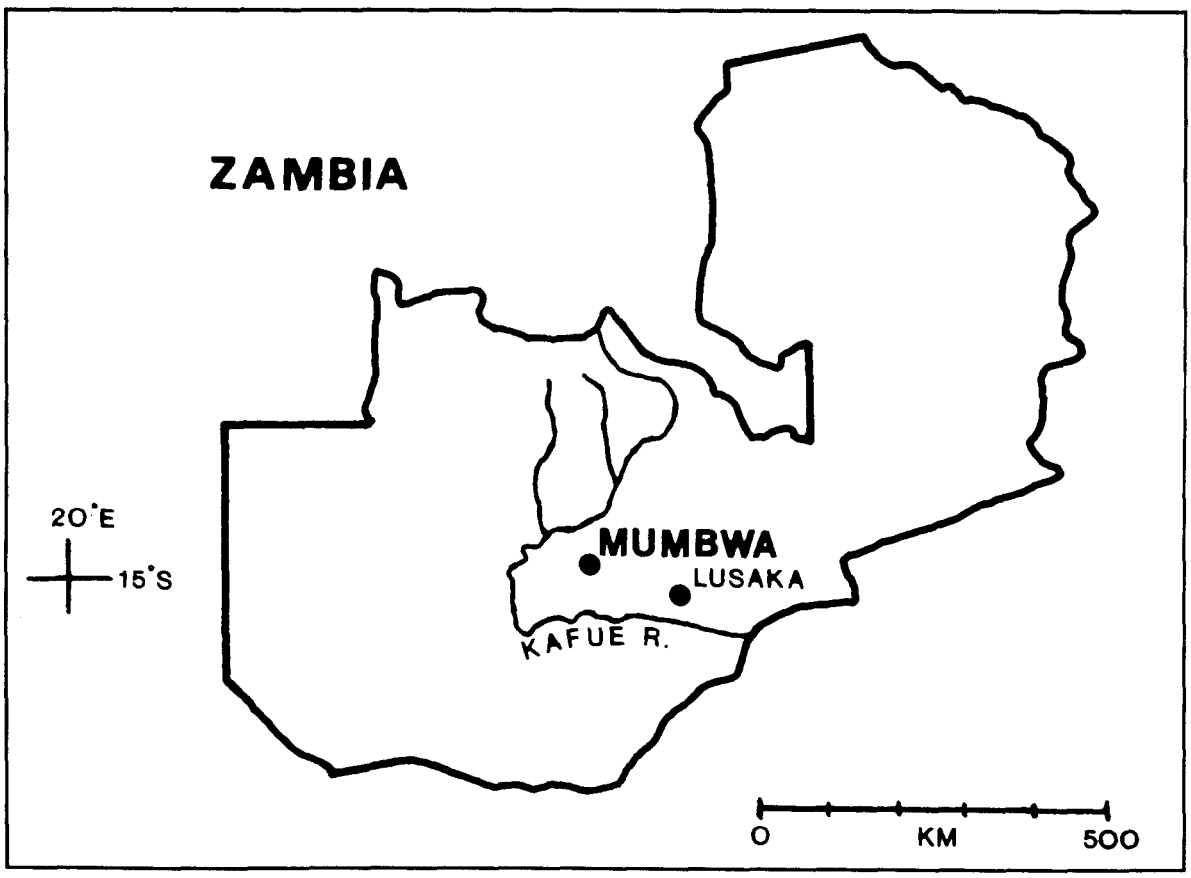

Figure 1: Location map of Mumbwa Caves, central Zambia

"coups-de-poing", one "semi coup de poing") and an unknown number of waste flakes. It has been placed among the late Acheulean/early MSA assemblages of south central Africa, comparable to late Sangoan or Charama assemblages of Zimbabwe (Volman 1984:185). Further excavation at Mumbwa could provide a much larger sample of this poorly known industry from a datable context.

1993 field season

During a brief three week season in June 1993 (Barham 1993), a team representing the Zambian National Heritage Conservation Commission, the Livingstone Museum and the universities of Bristol and Oxford assessed the extent of intact basal deposits in the main area excavated by Dart and Del Grande (1931) One metre square test pits were sunk around the edges of the earlier excavation (Figure 2). The pits con-

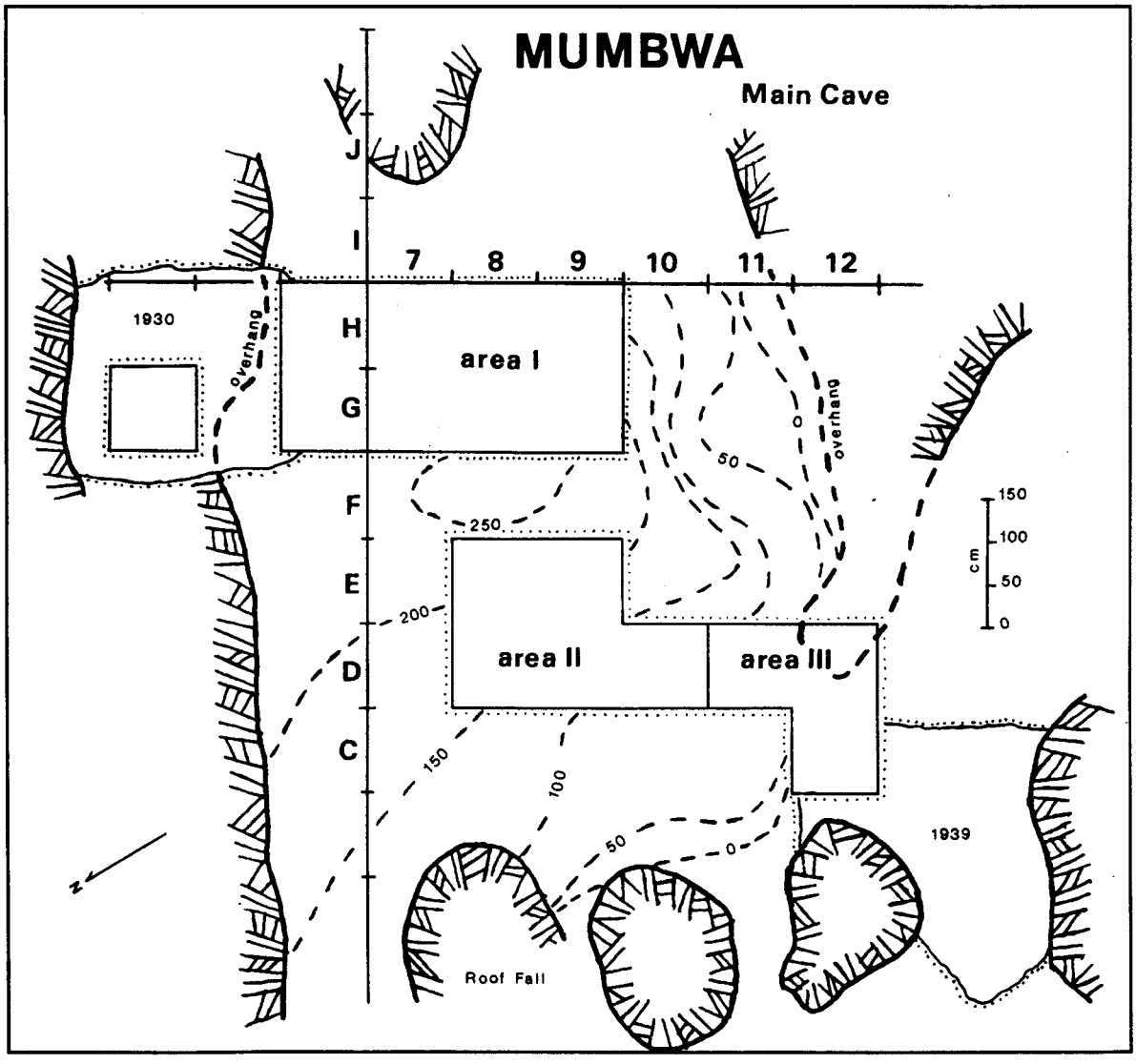

Figure 2: Site plan of the 1994 excavations showing Areas I-III and the location of the 1930 and 1939 excavations

firmed the basic stratigraphic sequence observed in 1930, with a basal occupation separated by two metres of culturally sterile deposit overlain by a Middle Stone Age component. Later Stone Age and Iron Age deposits complete the full six metre sequence at Mumbwa.

The artifact sample from the basal occupation is too small to make a definitive attribution other than to say it is MSA and possibly Charama (Barham 1993). The fact that this material occurs through a metre of deposit augurs well for the recovery of a statistically meaningful sample. Associated fragmentary animal bones including teeth offer economic and environmental data as well as the opportunity for ESR dating. Two human radius fragments belonging to anatomically modern *Homo sapiens* (C. Stringer, personal communication), were also recovered from the basal deposit. Larger scale excavation of this deposit is planned for 1996.

1994 field season

Before exposing the earliest occupation, at least three metres of overlying sediments and occupation debris had to be excavated in the central area of the main cave. This process began in 1994 with a six week season from late June through early August.

The site was divided into three areas or blocks of excavation squares. Area I comprised six squares forming a unit 3 m long and 2 m wide which would give maximum horizontal exposure within the surviving MSA deposit bordering the eastern edge of Dart and Del Grande's "central pit". It was the area of the central pit which produced the basal MSA found in 1930. Area II comprised five squares forming an irregular L-shaped unit bordering the western edge of the central pit. These squares sampled the uppermost MSA deposits and part of the MSA/LSA transition. Area III, consisting of three squares only, sampled the full transition to LSA and provided charcoal for dating the LSA and Iron Age occupation.

Radiocarbon samples have been submitted for the MSA/LSA transition and the results will be reported separately. Ten electron spin resonance (ESR) samples and 11 thermoluminescence (TL) samples have been submitted to Cambridge and Sheffield respectively. These should provide independent checks for dating the MSA and the early LSA.

Artifacts

A total of 62,614 lithics was recovered in 1994: 3,717 from the Iron Age deposit, 16,939 from the LSA and 40,060 from the upper MSA sequence. Detailed quantitative analysis will take place at a later date when an adequate sample is available from the basal deposit. In the interim, several general patterns are evident in the selection of raw materials, the manipulation of manuports and in the production of bone tools.

Vein quartz is the predominant raw material used at Mumbwa in all periods. Clark (1942) observed that a greater variety of materials was used in the MSA, something confirmed by the 1994 excavations. The nature of the difference lies in the selection of more fine grained materials such as chert, chalcedony and quartzite for making MSA tools contrasted with the use of vein quartz for LSA tools. Vein quartz is available locally within 200 yards of the cave whereas chert and chalcedony are found in the granite region of the Kafue Hook about 60 km from Mumbwa. The collection of quartzite also involves travel as far as 30 km.

The greater use of fine grained materials in the MSA is unusual compared with the LSA. At the Zambian sites of Kalemba Rock Shelter (Phillipson 1976) and Leopard's Hill Cave (Miller 1971) backed microliths appear in the latest MSA levels associated with an increased use of fine grained materials and this raw material preference continues into the LSA proper. At Mumbwa, the advent of microlithic technology corresponds with a narrowing of the raw material base. The implications for differences in group mobility and foraging strategy (Clark 1980; Ambrose and Lorenz 1990) will be examined in the course of the project. A working hypothesis is that the greater use of fine grained materials may be evidence of a wider foraging range or the operation of exchange networks during the MSA compared with an apparently less wide ranging and more socially independent LSA population.

Blocks of haematite weighing 1 kg and over occur in the MSA associated with hearths and structures. Some of these manuports, the sources

of which have not been located, have been modified either by grinding or scraping. Processed pieces were not found in the LSA sample excavated in 1994 nor were they prominent in the LSA levels excavated by Clark (1942).

Another working hypothesis is that the processing of pigment in the MSA may be evidence of heightened ritual activity, perhaps in response to late Pleistocene environmental conditions and social stresses (eg. Gamble 1986). The preliminary evidence for the MSA above the sterile deposits suggests drier conditions (M. Avery, personal communication) and this data is associated with evidence for windbreaks (see below) built within the cave. In the context of hearths and windbreaks, the processing of haematite provides more evidence of the emergence of complex MSA behaviors at Mumbwa.

Modified bone in the form of ground points, drilled fragments and a single decorated bird bone occurs in the MSA/LSA transition and in the LSA. The 2.5 cm long bird bone tube is broken at one end but bevelled at the other with two pairs of notches on one surface and a single pair on the opposite side. Traces of haematite remain on the bone and in the notches. Bone points and the processing of pigments are known from the Nachikufan LSA industry at Kalemba and Leopard's Hill from about 17,000 BP (Phillipson 1976; Miller 1971). The bone working at Mumbwa may be of comparable age but the modification of pigment stems from the MSA.

Features

Two classes of feature are distinctive of the Mumbwa MSA: hearths and windbreaks. The hearths, found in Areas I and II, have stone borders consisting of cave dolomite blocks and material transported from the local landscape, including quartz cobbles, phyllite, sandstone and cobbles of haematite. The experimental burning of dolomite in our camp fire produced patterns of colour and texture which matched those found in the excavated sample. This test was done to eliminate the possibility that the degraded dolomite found around the hearths was simply the product of chemical weathering and an accidental component of the features.

The structure of the hearths will be described at a later date, but in general the hearths are larger and more permanent in appearance than those found in the LSA deposit. Unfortunately, the excavation of a large area of the central deposit in 1930 makes it hazardous to suggest spatial differences in the distribution of hearths between the front and back of the cave, but the 1994 excavation did produce more hearths in Area II (six) compared with Area I (one). The hearth in Area I was originally interpreted as a furnace by Dart and Del Grande (1931) and left as a monument. Clark (1942), in the context of refuting Mumbwa's role as an iron smelting site, saw the oval base as a tomb. The excavation of the surviving base of this feature in 1994 provided evidence in the form of ash and burnt dolomite that this was in fact a large MSA hearth.

Three features were excavated in Area I which are interpreted as windbreaks. The best preserved is distinguished by a semi-circular arc of ash, sediment, quartz debitage and animal bone with three post holes preserved on the inner bend (Figure 3). In section, the ash and debitage dips either side of the mound which defines the arc. The arc is 175 cm long, between 30-40 cm wide and 20-25 cm thick from top to base. The ends have been unwittingly truncated by the 1930 excavations, but enough remains to estimate a diameter of 280 cm for a fully circular feature. The distribution of artifacts and debris either side of the arc is distinctive with almost no material found on the inside, which contrasts with a spread of debris outside the arc. Two circular patches of sediment with diameters of 10-12 cm were found on the inner edge, along with a third smaller circular patch of dark sediment. These three features are interpreted as post-holes which provided the framework for the superstructure of a windbreak. Less intact, but still distinctive, outlines of two earlier structures, one with a post-hole, were also recorded in Area I.

The windbreak interpretation derives from the positioning of the arcs in relation to the structure of the cavern system and its funnelling effect on the prevailing winter easterlies. Today, winter winds rush through the system from east to west along a narrow tunnel which opens into the main cave. The windbreaks bend away from the tunnel and would have protected the occupants of the cave and their hearths from the full effects of the

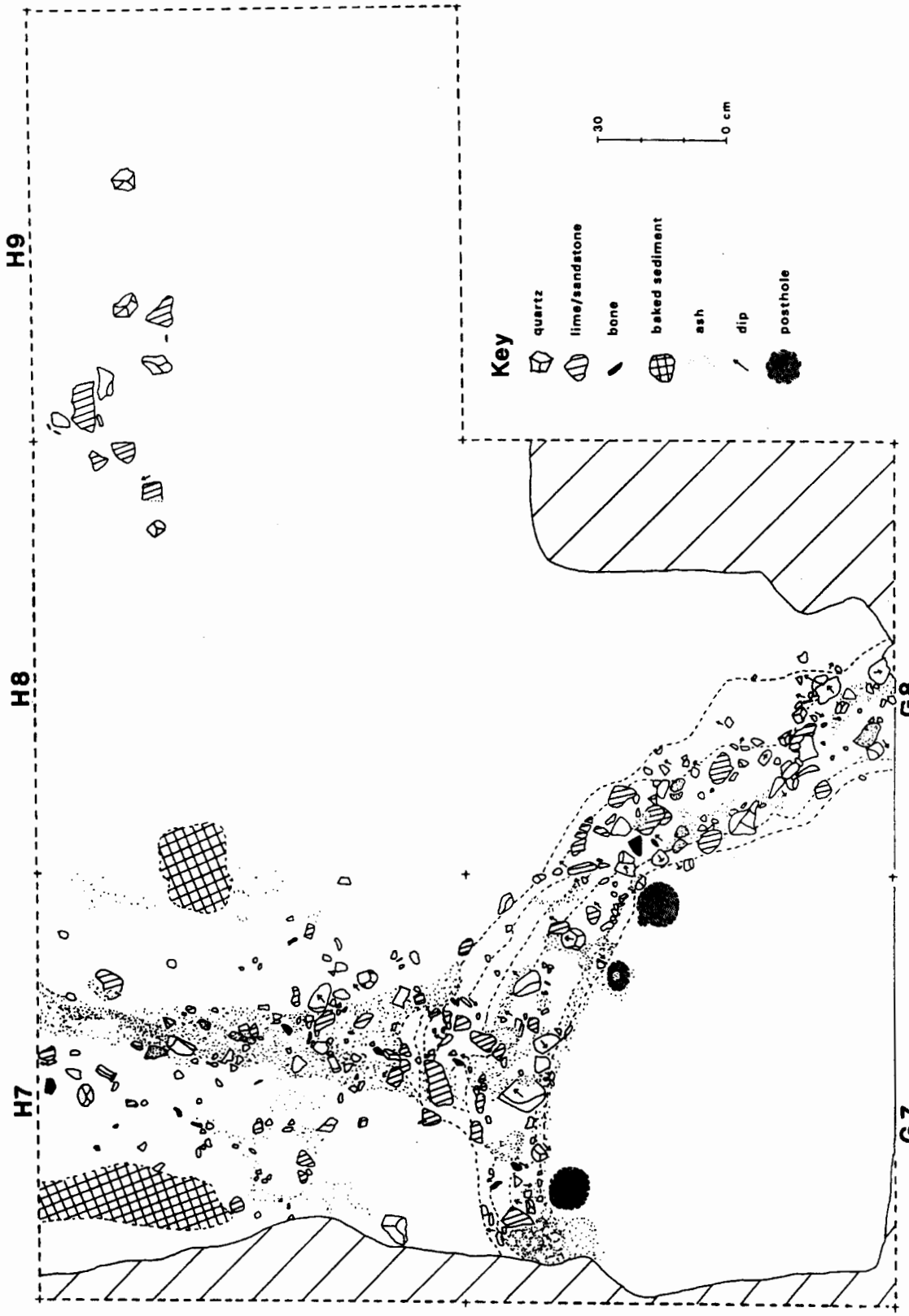

Figure 3: Plan of main windbreak in Area I showing position of post holes and the distribution of ash and debitage outside the arc

easterlies. Preliminary analysis of the microfauna from the 1994 season indicates dry conditions at the time of the occupation (M. Avery, personal communication). Such conditions would coincide with cooler phases of the late Pleistocene which were also associated with greater wind circulation strength (D. Thomas, personal communication).

Conclusions

Structures interpreted as windbreaks have been reported from the MSA site of Orangia I (Sampson 1968) and possibly from a late Acheulean context at Kalambo Falls (Clark 1969). Both are effectively undated, but suggest that the ability to modify the immediate landscape of living areas has some antiquity. Mumbwa, with its interior structures, provides further confirmation of the complex behavioral abilities of MSA peoples. Likewise, the substantial stone hearths at Mumbwa are evidence of an ability to structure a living space and actively to adapt to particular local conditions. These features, combined with the selection of raw materials and the processing of pigments, suggests a population which was modern in its behavioral repertoire. It was able to respond technologically and socially as well as demographically to its surroundings.

The Mumbwa sequence also documents a transition from MSA to LSA which appears to be gradual. Elements of LSA microlithic technology occur in the latest MSA and aspects of the MSA such as the modification of haematite continue into the LSA. Bone working is associated with this transition but it too may have earlier roots in the MSA. A single spatula shaped fragment of bone was found among the debris of the largest windbreak in Area I. In addition to the behavioral data emerging from the site, Mumbwa is providing basic data for dating and environmental reconstruction. With two more seasons of excavation in the offing, the prospects look good for filling a significant gap in the late Pleistocene prehistory of south central Africa.

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