THE LATER STONE AGE AND THE ROCK PAINTINGS OF CENTRAL TANZANIA

by

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ABSTRACT

The present study is a descriptive and comparative analysis of four Later Stone Age assemblages from four rock shelter sites in central Tanzania and the associated rock paintings. The sites were chosen and the rock painting data collected after an extensive survey which covered an area of about 64,000 sq. km.

The assemblages display some features considered characteristic of the Later Stone Age hunter/gatherer cultures of East Africa. The raw material used is almost exclusively quartz, and accounts for 90% of all the raw material. The industry is a flake industry with very few blades. The percentage of formal tools is comparatively low, and some categories such as points, burins and bone tools are almost nonexistent. The industry is microlithic, with geometric microliths, scrapers and *outils écaillés* accounting for the largest percentage of tools. The bipolar technique is prevalent. It is customary at present to lump all the late ill-defined industries of East Africa under the rubric of "Later Stone Age". Within this broad category however, it is possible to distinguish four tentative chrono-stratigraphic units:-

1. The "Basal" Later Stone Age;
2. The "Standard" Later Stone Age;
3. The "Terminal" Later Stone Age;
4. The Stone Bowl Cultures.

The typology, relative composition of artifact types and the short cultural chronological span would suggest that the central

Tanzania Later Stone Age falls in the third stage, the "Terminal Later Stone Age" of East Africa.

Although there are older Later Stone Age occurrences known from central Tanzania, the assemblages reported here fall between 3,500 and 200 years B.P., and represent a Kater Stone Age - Iron Age cultural continuum with pure Later Stone Age in the lower strata and an increasing proportion of Iron Age artifacts in the upper strata. It may therefore be inferred that Later Stone Age technology was not replaced by Iron Age technology at the time of introduction of the latter; rather the two technologies co-existed for some time. There are only minor inter-site and intra-site variations in tool frequencies.

Many authors have implied that the rock painting tradition was the work of the Later Stone Age and Iron Age peoples. Although there is no direct proof for this, it is of interest that when rock painting sites contain stratified archaeological deposits, the latter are usually Later Stone Age or Early Iron Age. This is the case not only in central Tanzania but also in Central and South Africa. The subject matter depicted suggests that this was a hunters' art, motivated either by magico-religious beliefs or the mere pleasure of painting and recording an event. Four stylistic categories have been recognized but their chronological sequence is adumbrated by unreliable superpositioning. The rock paintings of central Tanzania share some common features with the rock art of the Sahara and that of central/south Africa and may be related to the latter.

ACKNOWLEDGEMENTS

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A number of individuals have contributed in different ways at various stages of the study. I am particularly grateful to the three members of my advisory committee at Simon Fraser University; Dr. R. L. Carlson, Professor P. M. Hobler and Dr. B. Hayden, all of whom have provided considerable guidance and constant encouragement. Dr. C. Nelson of the University of Massachusetts not only let me examine his Late Stone Age collection from Uganda but also extended the hospitality of his house to me and spent many hours of fruitful discussions with me. Dr. R. M. Gramly, now of Peabody Museum, identified the animal teeth; Dr. Peter Schmidt of Brown University allowed me to examine his collection of pottery from Buhaya; Dr. D.

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INTRODUCTION

This dissertation is a descriptive and comparative analysis of four assemblages of the Late Stone Age[1] industries in central Tanzania and their relative place in the not too well known Late Stone Age industrial complexes[2] in East Africa on one hand, and the presumably associated rock paintings of central Tanzania on the other. In addition to the assemblages excavated by the author, small collections of Late Stone Age industries have been examined at the National Museum of Tanzania and other institutions. Other than the unpublished doctoral dissertation of C. Nelson (1973), the taxonomic classification and the concomitant analysis of typological variation among occurrences of the Late Stone Age in East Africa are rather superficially documents. On the other hand, the small amount of literature available is either too general to offer any convincing frame of reference for future work or is not always backed up by excavated evidence. Similarily, there are also excavated occurrences for which there are no reports. It is therefore the purpose of this dissertation to give a general synthesis of the Late Stone Age cultural remains in central Tanzania and to integrate this synthesis within the broader regional Late Stone Age industries of East Africa (Kenya, Tanzania and Uganda). The first and major part of this report is devoted to this end.

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[1]The correct usage as agreed by the 3rd Pan African Congress on Prehistory is "Later Stone Age." However "Late Stone Age" is commonly seen in recent literature.

[2]"Late Stone Age industrial complex" is not used as definitive formal cultural unit. Its use is informal because the LSA industries are yet undefined. The term "Later (or Late) Stone Age" cannot be used to formally name an "Industrial Complex" which must be named from a reference "Industry."

The sites excavated to produce the stratified data for the present study are all cave sites with rock paintings. Hitherto, only a few isolated sites in central Tanzania have been described; such descriptions cover selected sites in a particular geographical region. For instance, the rock paintings of the Kondoa area have been fairly well described, while those in the adjacent areas of Mbulu, Singida and Dodoma are hardly known, save for obscure and sporadic reports. The second part of the present study aims at treating the rock paintings in a wider geographical and theoretical perspective, in order to make meaningful generalizations about the rock paintings of central Tanzania. It will also be necessary, though briefly, to compare the paintings with those of eastern, central and southern Africa. An attempt is made to look into the ways and means of relating these rock painting traditions to the continua of the Late Stone Age industrial complexes by direct or inferred stratigraphical evidence, association of subject matter depicted, ethnographical evidence, or a combination of these.

PROCEDURE AND FORMAT

The dichotomy in the aims of the present study, i.e. the descriptive and comparative analysis of the Late Stone Age assemblages in central Tanzania and the study of the rock art and its presumed association with the former, in some ways dictates the procedure and format adopted. First the problem terminology and the techniques employed to conduct the field work are discussed within the introduction. Chapter 1 is a description of the present and past biogeographical considerations essential for an understanding of the Late Stone Age in central Tanzania. This is followed by Chapter 2, a description of the four sites from which the data forming the corpus of this dissertation come. Chapter 3 is a detailed analysis of the four assemblages in terms of typological counts, and where appropriate, comparisons with available comparable assemblages from central Tanzania and a few selected ones from other parts of East Africa. The Late Stone Age industrial complexes a known to span a period of almost 20,000 years and, as such, there are extreme temporal and spatial variations of a technological and functional nature. Consequently, assemblages in different geographical regions have been given different names, and different artifact types have been singled out as the diagnostic markers of this or that industry. This complexity necessitates a general review of the Late Stone Age in order to critically evaluate the place of the assemblages within the Late Stone Age continua. In Chapter 4 an attempt is made to discuss variability within the Late Stone Age of central Tanzania and to integrate the assemblages into a general chronological model for the East African Late Stone Age industries.

The second part of the study is contained in Chapter 5 and deals with the rock paintings of central Tanzania. It addresses itself to the questions of site location in relation to the local environment, subject matter commonly represented, stylistic sequences, interpretations, and the authorship of the pictographs. The subject depicted is analysed in terms of the frequency of any one representation and in overall syntactic scenic relationships. The writer maintains that style cannot be examined in isolation from the subject matter and vice versa. A general model for stylistic sequences is suggested and possible stylistic meanings inferred. At this juncture, a discussion of the more common themes and their meanings as related to the Late Stone Age cultures of central Tanzania follows, taking recourse to ethnographic evidences and wherever possible to oral tradition.

This discussion sets the scene for a comparison of the rock paintings of central Tanzania with those of eastern, central and Southern Africa, followed by a discourse on possible theories of connection. The final section of Chapter 5 discusses the problems of dating rock art, especially that of relating rock art to stratified archaeological deposits, in this case, the Late Stone Age assemblages. In the same context, one is rightly tempted to ask; "Who were the artists?" While it is unquestionable that the Bushmen were responsible for the rock art of southern Africa, the authorship of the Tanzania rock paintings remain enigmatic. No human skeletal remains have been directly associated with the paintings. Ethnographic evidence and oral tradition are once more critically examined for clues.

In Chapter 6 the data presented in the thesis is once again examined for general conclusions and possible directions for future work on the Late Stone Age industries and the rock paintings of central Tanzania in particular, in the overall framework of the East African Late Stone Age industrial complexes.

TERMINOLOGY

African prehistory is currently in a state of terminological revision. At the Burg Wartenstein Symposium in 1965, a series of resolutions were passed and ratified by the Pan African Congress on Prehistory in 1970. It was agreed at the symposium that most of the established terminological labels were ill-defined and might not cover real industrial, cultural or entities. Hence new excavations must be oriented towards the accurate description of cultural remains which could serve in the future as bases for the definition of new cultural-stratigraphic units. A new and provisional hierarchy of cultural-stratigraphic units which is to be the subject of experiment in the next few years was adopted (Bishop and Clark 1967).

Although the East African Late Stone Age has not yet been worked out fully enough for an overall widely-accepted taxonomic nomenclature, nevertheless the writer has tried to maintain such typological terminologies as are currently used in sub-Saharan Africa. This has the advantage not only of facilitating inter-site assemblage comparisons on the regional level but also helps to standardize nomenclature. The nomenclature adopted in this study corresponds more or less with that of Nelson (1973) for the obvious reason that the latter is the most complete work on the Late Stone Age of East Africa to date. Nevertheless, the writer has found it necessary to make a few typo-terminological modifications to fit the particular characters of the four assemblages described herein. It is hoped that the comparison will be found useful for an understanding of the Late Stone Age in East Africa, but as is usually the case,any conclusions made are contingent upon present knowledge of the research and are subject to change *mutatis mutandis*.

FIELD METHODS AND THE SURVEY

Having familiarized myself with the rather limited literature on central Tanzania, a general survey of the area was embarked on. Survey work started on July 10, 1974, and after a period of 5 weeks, an area of approximately 64,000 sq. km. had been covered. (Fig. 1).

The purpose of the survey was two-fold:

1. To record all the known and newly discovered archaeological sites, especially those with rock paintings, in the regions of Dodoma and Singida for the present study and for future work.
2. To select a few stratified rock paintings sites for intensive study of stratified archaeological deposits and the presumably associated rock art. The choice was

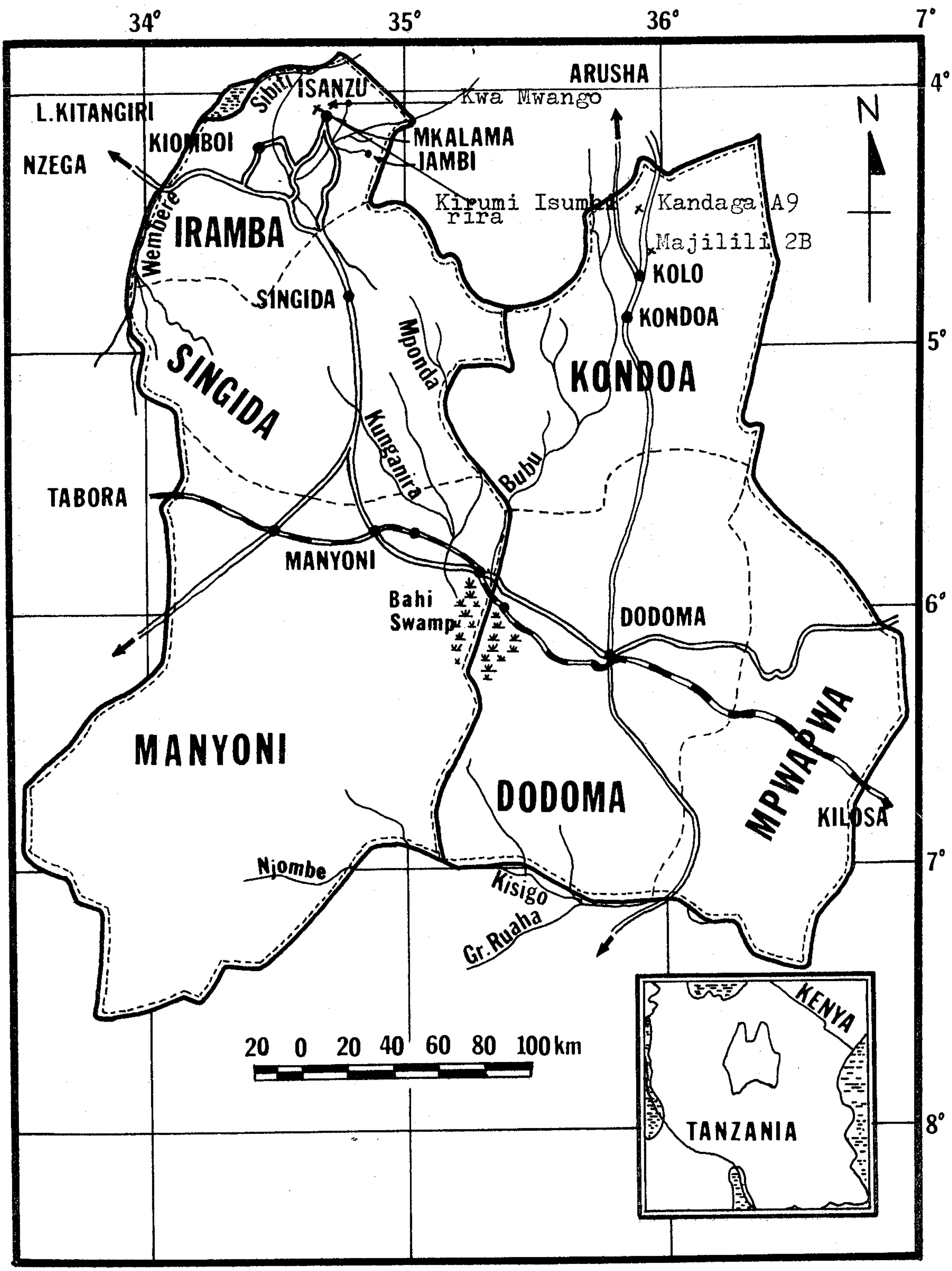

Fig. 1 Map of central Tanzania showing areas covered by the Survey; i.e. Dodoma and Singida Regions. x indicates sites excavated.

influenced by factors such as ease of accessibility, proximity of suitable camp grounds, and availability of supporting labour force.

TECHNIQUES

The method adopted was to a large extent decided by the area to be covered, the time, equipment, funds and manpower at our disposal, but above all by the nature of the terrain and the purposes for the research. Most of the archaeological sites in central Tanzania are hidden and obscured under rock shelters, caves or a thick undergrowth, and therefore aerial photography would merely show the rock hills which are in any case known to stud the landscape and would add little to our knowledge of archaeological sites. The survey was done by using simple and inexpensive equipment such as compasses, augers, cameras, field glasses, topographic maps and survey forms.

The survey team was divided into two contingents[3], the leaders each of which were issued a large scale topographic map of the area to be surveyed with precise instructions of what part was to be covered. Specially designed survey forms (see example in appendix E) summarizing information relevant to the archaeological, geographical and ethnographical

[3] One of the contingents was led by Mr. J. Mbilingi, a second year history student from Mazengo, and I personally led the other as well as coordinated the work being done by the two groups.

aspects of the area were carried and completed at the site. In addition, duplicate black and white photographs and colour slides of every site seen and recorded were taken so that there is a complete record of all the sites surveyed. Whenever possible, tracings and quick hand sketches of prominent rock paintings were made. However, for rock painting sites, emphasis was put on taking as many black and white and colour slides as possible at different angles and experimenting with different filters.

It would have been impossible to cover every nook of the area on foot, for this would have taken more than a year. Instead, we supplemented the intensive survey of suspected land forms such as hills , rock shelters and caves with stop-overs at schools, missions, administrative centres, Ujamaa villages[4], research centres, etc; to talk to the people about their knowledge of the local area. Several sites were discovered through information extracted in this way. Many sites unknown to the local people were also discovered on our own initiative through incessant search of suspected kopjes, rock shelters and caves (Masao in press). We covered most of the ground in our two landrovers, driving as close as possible to suspected features. Our field glasses were useful when trying to determine if an

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[4]Ujamaa villages are communal settlement areas started and financially subsidized by the Tanzania Government, following the Arusha Declaration in 1967. The economic rationale behind it is the argument that by settling many people together, it becomes less costly to provide them with the infrastructure and other services considered the sine qua non for development.

open rock shelter had paintings or not. Where the land was uninhabited, we simply drove around, and whenever we suspected an area either due to the nature of the vegetation or the relief, we stopped and walked around until most or all of the area had been covered. It was observed that most of the sites occurred on rocky hill slopes commanding a wide view of the adjacent lowlands and plains. Rock shelters and caves were thoroughly searched for rock paintings and archaeological deposits. Where the site contained surface artifacts (lithics and pottery), it was quickly tested to ascertain whether or not there were any stratified archaeological deposits by driving a one inch diameter grooved iron probe into the ground. Limited time and the vastness of the area to be covered made it impossible to dig test pits at every site. For political reasons, it was deemed necessary to survey one political division after another to avoid unnecessary problems with local administrative personnel.

THE SURVEY FINDINGS

Dodoma district was covered during the first week of the survey; besides the rock painting sites of Bahi, Mpamantwa, Nala, several 'brick' sites and one site littered with hollowed grinding stones, no other archaeological sites were seen. All paintings at Bahi cave are executed in thick rather oily white paste. The priest of the nearby mission reported that there used to be grinding stones (metates) lying all around the shelter, but search for them was not successful. He also recalled that an old iron hoe had also been in the cave but nobody knew what had happened to it. Several rock shelters and caves were found throughout the survey. Ethnographic reports from the local people indicate that such sites are sometimes used as sanctuaries for offering sacrifices. Three kilometers southeast of Bahi is Mpamantwa cave. At this site all the paintings except a red one in the form of a figure eight, are in white. However, due to exfoliation of the rock, the paintings are not easily identifiable. Other than a few modern potsherds, there were no artifacts.

Further south is Nala rock shelter with paintings both in red and white. The art in this site, though depicted in different styles and two pigments, could be contemporaneous as no instances of superpositionings were detected (see P. 392)

5 km. south of Bahi is a huge outcrop known as Makulu, the slopes of which are literally littered with hollowed grinding stones of various shapes and sizes. It is conceivable that the grinding stones were brought to this site for ceremonial purposes. Alternatively, it may have been a factory site where people hewed the rocks, but this is unlikely because some of the grinding stones are worn out, evidently due to utilization.

All the other sites seen in Dodoma district are the familiar burnt clay hut ruins which Sutton (1969,1973) has referred to as 'brick' sites, possibly of Late Iron Age. Oral tradition in Ugogo attributes these burnt clay huts to the mythical "Wa-Yenzere" which literally translates to "Whites" a reference which cannot be corroborated historically. If these sites are really of Late Iron Age as Sutton (1973) maintains, then I cannot see any other people responsible for them except the present inhabitants, the Wagogo who have been living in this area at least for the last 250 years (Fosbrooke 1950: 14, Schaegelen 1938:202). Different types of pottery were collected from these sites, and a pronouncement will have to await a complete analysis, but they appear to resemble Iron Age pottery in East Africa. Their analysis supplemented by oral tradition may perhaps shed some light on the mysterious "Wa-Yenzere", who are also mythologically accredited with responsibility for the rock art in some parts of Dodoma district.

Having finished surveying Dodoma district, we moved to the adjacent district of Mpwapwa, but only the western half was surveyed. Our team was rather discouraged from going further because no sites other than the familiar "brick" sites, and a few potsherds scattered here and there with no archaeological provenience or context, were found. At Mbuga, Kibakwe division, the local people reported that one of the rocks on the hill slopes had foot print petroglyphs, but our search for this site, in spite of local guides, proved unsuccessful.

Manyoni, one of the three districts in Singida Region was surveyed next. Here we were more fortunate, for although we did not record many sites, we discovered what appeared to be an unstratified Late Stone Age site at Iseke, only 100 m.

from Iseke Primary School. On the crest of a dome-shaped massive granite inselberg, we noticed a rather unusual concentration of quartz, quartzite and a few chalcedony chips which on closer examination turned out to be flakes and microlithic flake tools. A sample was collected from a 1 m. diameter circle for further study. Chances are that this was a factory site, once used by people who were attracted by the huge outcrop whose dome-shaped top has a series of deep, but small cirque-like lakes. The quartz and quartzite is locally obtainable but the chert may have been brought in from other areas. One of the lakes is said to contain water almost throughout the year. The geological conditions favouring the formation of such lakes, have not been researched.

Seven kilometers north of Iseke is Nkonko village, and about 9 km. west of the latter in a thick tsetse (Glosina morsitans) infested miombo (Brachystegia sp.) woodland is a huge dome-shaped oblong granitic outcrop about 750 m. long and 200 m. wide at the base. It has been extremely eroded and exfoliated. On the almost flat top were discovered huge boulders with rows of depressions. One of the boulders had a total of 98 such depressions ranging from 5-7 cm. in diameter and 0.3-0.5 cm. in depth. The number of depressions would be too many for the modern "bau" game which requires only two rows of 12 depressions each, but perhaps there were other versions of the game before it was standardized in its present form. On the other hand, it is tempting to speculate whether the depressions may not have been used as a calendar or a device for some important events, or even for processing food as the Hadza are known to do. The local people deny knowledge of either the people responsible for them, or what they possibly signify. Similar "bau" petroglyphs have been reported by Sutton (1973:36) and Bower (1973:137) in the western highlands of Kenya and by Matson (1972) in Uganda.[5] There are other depressions on the same rock, but these are shallow and oval in shape, and extremely smooth as if they were used for whetting or rubbing something on. Occasionally, they occur singularly but otherwise in twos, threes, fours and fives. One of the pairs measured 19 cm. across and 20 cm. long. Chaplin (1974:10) has reported "four shallow lanceolate depressions" on an exposed granite at Kibengo which he considers to be a natural phenomena.

Time did not allow us to survey the whole of Manyoni district. Rather we restricted our activities to the eastern half of the district. Twenty kilometers from Manyoni town on the road to Dodoma is the village of Suka Mahela and close by is a small range of hills called Mnyamare, which has a number of shelters and caves. Some rock paintings executed in a black, thick paste were discovered in one of the caves.

[5]The "bau" or "bao" was a very widely spread game in sub-Saharan Africa and supposedly brought to East Africa by the Bantu. Traditionally, the bau board has two rows of between 8-12 depressions and is played by two people, one on each side of the bau board.

(Masao in press). The site was not known to the local people, but having found a few old potsherds littered around the entrance of the cave, we decided to search further and so discovered the paintings. The representations were rather faint for absolute identification, but we tentatively identified a cow, a tree and a giraffe. A grinding stone and a wooden mortar lying outside the cave were thought to be contemporary, but the local people pointed out that the mortar was stylistically very different from those used by the present day Wagogo. There were no other archaeological artifacts nor did further searching reveal any more sites in spite of many favourable looking rock shelters and caves. It is very likely that Mnyamare cave was still in use recently as a sanctuary, thus accounting for the grinding stone and mortar.

The survey in Iramba district went much faster. Not only is travelling from one place to another easier, but it was one of the better documented areas. Many already known and recorded sites (Kohl Larsen 1935, Odner 1971) were re-visited, but a number of new sites were also discovered. These have been fully dealt with elsewhere (Masao in press). Odner reports 17 Late Stone Age sites, five of which have rock paintings, while 13 of them revealed Iron Age pottery from some of the earliest wares such as Kansyore ware to modern types of plaited cord roulette and comb stamped ware (Odner 1971:157-77). Most of the rock painting sites reported by Odner were reinvestigated. The most impressive are "Kisana Nzuni" and "Kisana Ngombe", two rock shelters in one site with paintings of human beings, cattle and various other animals in silhouette. Another is Lulumpampembele ("Rhinoceros Cave"). (Fig. 73). The paintings are predominantly executed in bright red, but a few are in different shades of white. In the same area are caves with huge wooden drums, ethnographically no longer used by the Wanyiramba. Similar drums have likewise been reported by G. Hunter and P. Pender Cudlip (Odner 1971:157). The drums are said to have been used for rituals connected with rain making, and some of the caves are still held sacred by the people.

Much more time was spent in Isanzu which borders Iramba on the east. Altogether, 11 rock painting sites, five of which had not been recorded before, were seen. Four of these (Kinto, Kirumi Isumbirira, Munyeti and Kwa Mwango) had a surface concentration of debris, which turned out to be flakes and flake tools, and when tested proved to have stratified deposits. Accordingly, they were earmarked for possible excavation after the survey. Indeed, one of the sites had already been excavated by Kohl Larsen in 1935. A full description of these sites is contained in another paper (Masao in press), but suffice it to point out that in the author's opinion, the Isanzu sites are among the richest rock painting sites with a large repertoire of friezes and naturalistic silhouettes of varied subject matter, pigments and styles. Two of the caves had paintings ranging from well executed naturalistic animals in various shades of white to the crude white geometrics and tectiforms. It was observed that cave robbing has not been practiced as much as in the Kondoa area. Only one rock gong was discovered at Munyeti rock shelter, Isanzu, although Chaplin (1974) has reported several in the Lake Victoria area.

To the south of Isanzu is Iambi, another area visited and reported by Kohl Larsen (1935, 1958). Unfortunately, only some of Kohl Larsen's sites were located, but two new sites (Mulyalya and Ikunda) were added to the list. The art does not appear as prolific as that in Isanzu. Almost all the paintings in the sites seen are red except a few representations in white at Mulyalya. The latter was also littered with artifacts but being difficult to get at and the floor of the shelter strewn with huge boulders, it was not considered suitable for excavation. The Iambi region of paintings seems to run in a west-east direction to Singida district where several sites, most of them not previously recorded were discovered.

Like in Iramba, the rock painting sites in Singida are restricted to the northern half. The sites of Hanje Mwao, Taru, Ng'ongoamau and Msule Irimiya, all of which lie in the central zone of Singida, are an exception. The paintings at Hanje and Taru are more or less alike in style, both being predominantly naturalistic silhouettes in thick red wash. Hanje contained stratified archaeological deposits but since it appeared very much disturbed, presumably by cave robbers, it was ruled out for possible excavation. Ng'ongoamau was exceptionally interesting, if only because there were paintings executed in three different pigments (red, white and black) at different parts of the cave. As if to contrast the latter, the paintings at Msule

Irimiya were all in bright white. In the northern half of the district, we discovered several sites, but the most outstanding are those at Sanga Mwadifu where three rock shelters in the kopje have paintings in red, black and white. One of the shelters has a representation of a motor-car and is obviously a rather recent painting. It should be mentioned that some of the Singida paintings were reported by Culwick (1931:444-453), but since no systematic work followed, some of his sites could not be certified. Sanga Mwadifu was tested and found to have no archaeological deposits. Ngimu is another impressive rock painting site, and being culturally stratified was earmarked for possible excavation. It is one of the largest rock shelter (both in width and height), being about 300 m. circumference at the base and about 50 m. high. There are paintings all in red almost all around up to a height of 10 m. from the ground. The subject matter is varied and so is the style of the paintings, ranging from naturalistics, geometrics, to enigmatic tectiforms. Various superpositionings were detected. A number of activities, such as ceremonial hunting and possibly fighting are depicted. Perhaps the work of several generations is represented in this enormous rock canvass. Other rock painting sites were studied and recorded at Ilongero, Ikhanoda, Mjakhuda, Ighange, Mwayati, Ngongoagimu 2, Mituti Ilisia, Mipilo Merya, Mwamuringa and Mwamitera. Only one of these, Ikhanoda, appeared worth excavating, but from the point of view of the rock art, they are all interesting as they combine to give the comparative data used in the analysis of the rock art in this study.

The final leg of the survey brought us to Kondoa district. Since this area is the best known one in Central Tanzania in terms of archaeological sites, our time was spent revisiting most of the sites and recording the rock art prior to deciding which sites to excavate. In Kondoa people had mysteriously been led to believe that there were diamonds and other treasures buried under the rock art shelters by the Portuguese. The belief was evidently strengthened when they saw the delegates to the 1947 Pan African Congress of Prehistory visiting some of the sites with Dr. L. S. B. Leakey. The delegates were all white people. Many of the sites in Kondoa have been disturbed by unscrupulous cave robbers, and since this might make any retractable stratified data unrepresentative, the choice of suitable sites for excavation had been rendered rather restrictive. All factors considered, it was decided to excavate Kandaga A9 (ca. 4° 33' S, 35° 46' E) and Majilili 2B (ca. 4° 44' S, 35° 52' E) (Figs. 5,11) in Kondoa, both of which have rock paintings. In Isanzu (Singida Region), the sites of Kwa Mwango (ca. 4° 6' S, 45° 45' E) and Kirumi Isumbirira (ca. 4° 6' S, 34° 43' E) (Figs. 14, 17) were chosen for excavation. Most of the report which follows is about the four rock painting sites excavated and the resultant findings.

CHAPTER 1

Geographical Considerations

For the purpose of this study, central Tanzania consists of the political units of Mpwapwa, Dodoma, Kondoa (Dodoma Region), Manyoni, Singida Iramba (Singida Region) Hanang and Mbulu (Arusha Region). The last two units were not included in the survey. The area lies roughly between 4° .00 - 7° 20' S and 33° 40' - 36° 50' E, within the northern half of the Central Plateau of Tanzania (Fig. 2). Many of the relief features are associated with the tectonics of the Rift Valley system. Until the advent of the Rift Valley cycle of vulcanicity and seismic instability, Tanzania, and for that matter, East Africa, had on the whole enjoyed a period of tectonic quiescence, extending over a long period during which weathering and denudation were the dominant geomorphological factors. The era of tectonic stability was terminated by accelerated earth movements causing warping and faulting, and consequently, the complex Rift Valleys of East Africa were produced. The original features go back into pre-Cambrian times, but the present steep and fresh scarps are clearly mid Pleistocene i.e. less than 500,000 years in age although rift faulting is still active especially along the Iramba escarpment (Atlas of Tanzania 1956:1, Ojang 1968:25).

Within central Tanzania are major fault lines associated with the main Great Rift Valley system (Fig. 3). In the north, the faulting of a westerly offshoot of the Gregory Rift, can

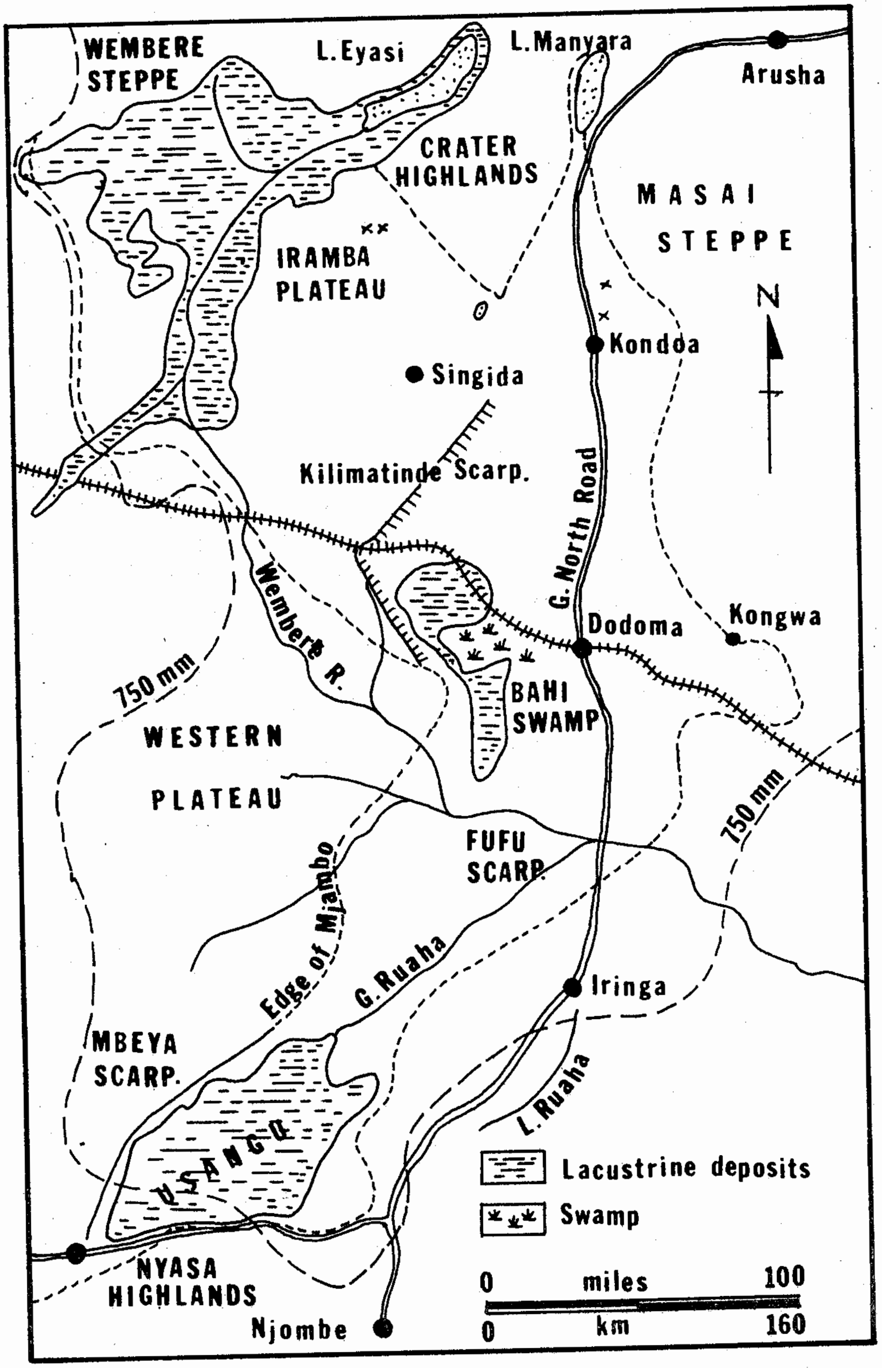

Fig. 2 The central zone of Tanzania (after Morgan, 1973)

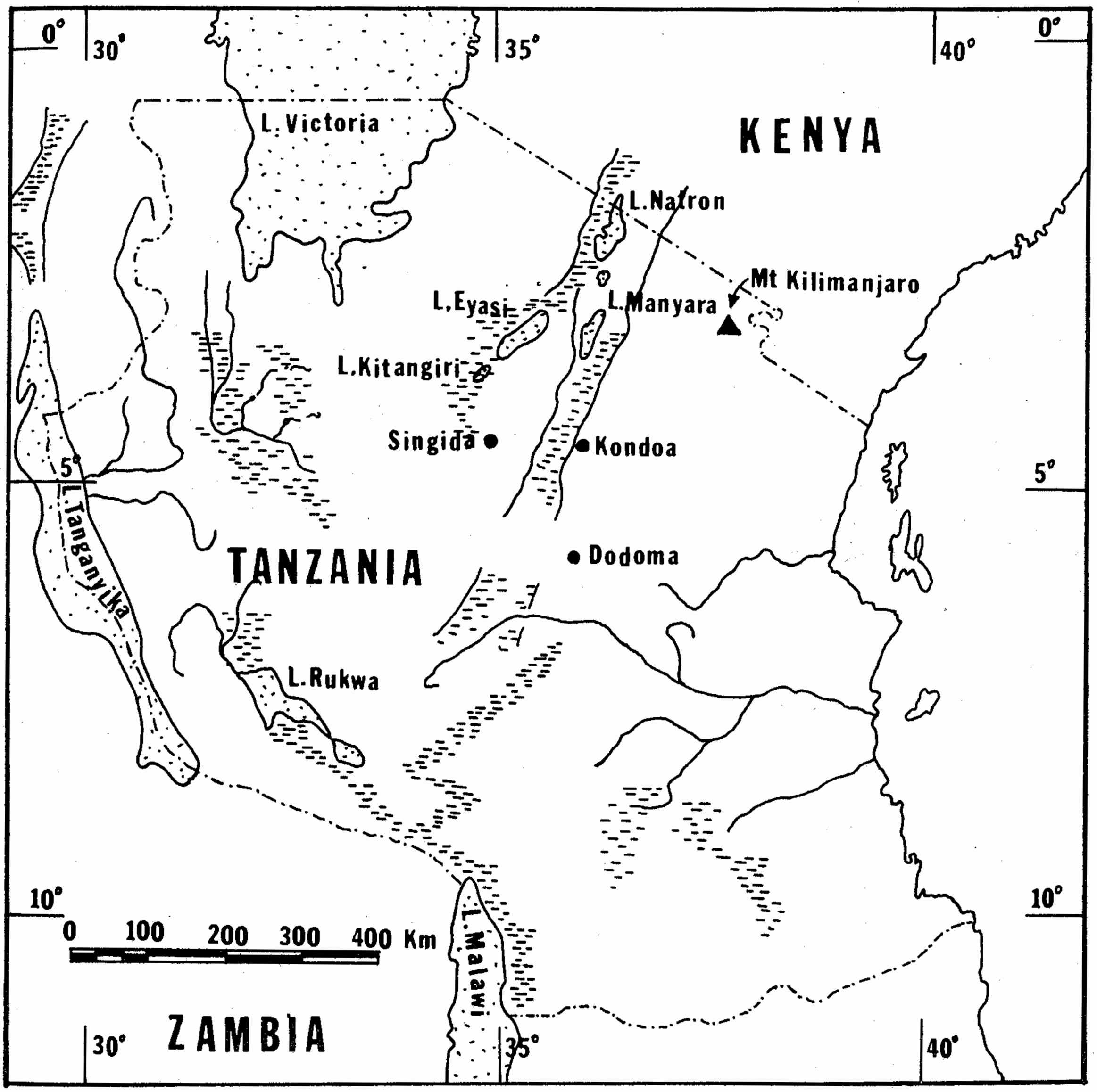

Fig. 3 The major Fault lines associated with the Rift Valley system in Tanzania.

be followed into the fault scarps overlooking lakes Eyasi and Manyara, but beyond this, the faulting does not follow any distinctive alignment. The intervening belt of confused faulting and warping suggests a continuation of tectonic forces deflected around the edge of the undisturbed interior and sending tectonic ripples and displacements on the eastern scarp of which the Kondoa range of hills are part. To the west is the Iramba plateau, a conspicuous horst, which as a result of earth movements involving continental uplifts and fracturing, has been faulted on three sides with the Wembere-Eyasi scarp on the northwest, Lake Kitangiri on the west and Bahi depression on the south (Morgan 1973:235-238). The tectonic pattern was followed by a series of prolonged periods of subaerial erosion interrupted by a number of changes in the base level producing a seriesof planations. Thus, there are significant local altitudinal variations within the area. The Iramba plateau is a good example. The latter rises to 1600-1800 m. above sea level and forms the eastern escarpment of the Wembere-Eyasi scarp.

Geologically, the chief rock formation in central Tanzania, especially in Kondoa, is the basement system and its derivatives. To the west of Kondoa, a granitoid shield predominates. The latter is also found in Singida, appearing together with mobilized granite. Extensive granitization of the rocks has brought about the formation of migmatites, granites and related rocks which together make up what is known as the granitoid shield. The mobilized granites are intrusive granites presumably brought about as a result of large scale emplacement of "younger" granites into Nyanzian and Kavirondian rocks (Atlas of Tanzania 1956:2). On the other hand, the basement system rocks, consist in general, of coarsely crystalline metamorphic rocks of sedimentary and volcanic origin. However, it must be pointed out that volcanic rocks are rare in the six districts covered in the survey, but many forms of quartz (cryptocrystalline, clear & vein), quartzite and other derivatives of crystalline metamorphic rocks occur in plenty. They include gneiss and schists, characterized generally by the presence of biotite, but also frequently containing other minerals such as kyanite, garnet, hornblende, graphite and chlorite; granulites, quartizites, crystalline limestone or marbles, amphibolites and pyroxenites (Atlas of Tanzania 1956: 3).

In short therefore, much of central Tanzania is a land of plateaus and isolated rocky hills and inselbergs studded here and there. The northern half of Iramba plateau referred to above is covered by bushland and wooded grassland of Combretum and Parinari sp. and scattered bushes covering less than 50% of the ground. This vegetation type comprises a great many subtypes, among which the most frequent are termed "Open Bush", and "Parkland". To the south, with decreasing rainfall, the vegetation gradually gives way to the tsetse (Glossina morsitans)[6] infested Brachystegia woodland. The

[6] There are 7 species of tsetse all of which are vectors of the bovine form of "trypanosomiasis" but the human T. rhodesiense has virtually been brought under control.

woodland known as Miombo or Brachystegia-Isoberina, is represented by two species, namely I. paniculata and I. globiflora.[7] Other trees of the woodland vegetation include species of acacia such as A. drepanalobium and A. tortillis. To the east, the plateau is separated from the rocky ranges of Isanzu and Iambi by the Durumo river (Atlas of Tanganyika 1956:4-9; Ojang 1968:38-41; Odner 1971:51; Morgan 1973:54).

As already pointed out, Plio-pleistocene post tectonic dissection followed many fault lines. The Bubu River which dissects the Usandawe hills and separates them from the Kondoa range of hills (Masai escarpment) occupies one of these fault lines. More or less similar vegetational patterns as those of Singida obtain in Kondoa, but in general, there is much more woodland than bushland. The most common big trees are Brachystegia speciformis, B. microphyla, Sclerocary birrea, Pterocarpus angloensis, Entandophragma bussei, Terminalia, sericea, baobab, etc., while small trees include species of Comiphora, Euphorbia, Carthium, Fagara, etc. In the valley bottoms are Acacia kirkii, A. tortillis, A. nigrosens, A. rovumae, Delenix alata, etc. On the wide and flat valley of Bubu are thick and evergreen bush, lianas, papyrus and mbuga type vegetation. The ridge crests with their granitic outcrops and thin stony soil do not support much more than a handful of thorny shrubs of Pseudoprosopis, Combretum, Burttia, Grewia and Bussia, sp. (Newman 1970:6-13).

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[7]These have now been placed in the genus Jubernalia (Morgan 1973:57).

Erosion and denudation have left rock shelters and caves in the more resistant rocks. Some of these were used by Later Stone Age Man as camp or home bases. More recently, the whole of central Tanzania has suffered immensely from the effects of recent erosion partly due to overgrazing and clearing for cultivation, as a result of which, weathering and leaching have taken a heavy toll of the fertile organic top soil. Soils are therefore generally poor, and this coupled with the relative unreliability of rainfall makes it necessary to supplement agriculture with animal husbandry.

Large alititudinal variation induced local variation in the climate. The mean annual rainfall may be as low as 520 mm. but means of 1400 mm. are also reported. However, of more significance is the reliability of rainfall at the annual mean of 750 mm. (the minimum required for maize) which falls on the average one year out of five. Only 4% of Tanzania mainland can expect more than 1,290 mm. of rain in four out of five years. Temperatures are likewise influenced by altitude, but the whole of central Tanzania experiences diurnal high temperatures most of the year. The annual mean for Tabora is 23°C (Ojang 1968: 32:37; Morgan 1973:45-46).

Wildlife is a major component of the environment of East Africa. The three different vegetation types, woodland, bushland/thicket and woodland/grassland, contain a characteristic assemblage of wildlife. The three environments are not by any means the richest in terms of biomass but it can safely be assumed that the animal life was much more prolific before the environments were interfered with by the impending activity of man. Not only did man reduce the natural habitats of these animals by clearing for agriculture, and much less by the practice of animal husbandry, but he also killed many of the animals for food, sport or because he considered them pests. Antelopes may eat the crops, but are themselves

eaten. Many were driven off to other less desirable. environments. However, there are still a few eland, buffalo, kudu, warthog, rhino, dikdik (<u>Phynchotragus kirkii</u>), giraffe, hyena, jackal and leopard in the environments of central Tanzania. Fig. 4 shows an undisturbed ecological distribution among the principal game animals. The three environments may conveniently be lumped together under what Butzer (1971) calls Tropical Parklands and Woodlands, which are known to have a high carrying capacity.

For instance, in East African game reserves without overgrazing, the biomass of savanna woodland environments is reported to vary between 5,000-20,000 kg. per sq. km.; indices for overgrazed parks exceed 35,000 kg./sq. km. and that of a dense equatorial forest as in Ghana, is less than 6 kg. /sq. km. (Butzer 1971:146-147).

At one time the Singida-Kondoa macro environments may have had as high a carrying capacity as that for the East African game reserves. It is argued that during most of the Pleistocene, the carrying capacity for the African savannas

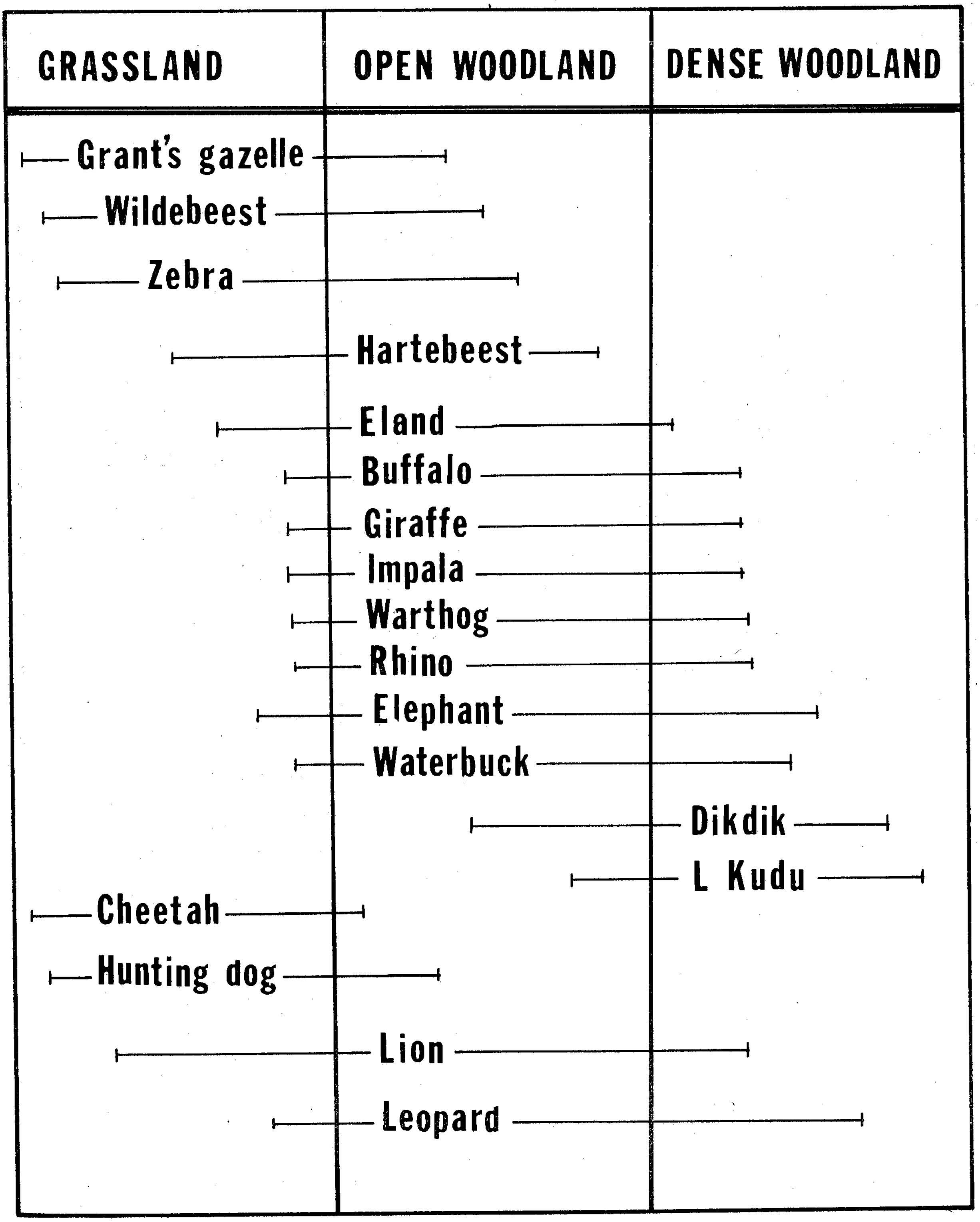

Fig.4 Ecological separation among the principal game animals (after Lamprey, 1963)

was even greater. Large ungulates were more varied and more numerous during the last million years than they are today; perhaps the climate was more conducive to the environments supporting a more prolific biotic life. However, since this study is concerned with the Late Stone Age, we shall focus on the last 20,000 years. Of critical importance here, is the fact that other than the abundance of the ungulate fauna, the openness of the parkland savannas facilitated pursuit by sight; the gregariousness of many of the species facilitated game drives; and the tendency of the animals to drop the young in any month of the year helped towards ensuring constant meat supply to the bands of hunter-collectors, as the young were more vulnerable to the weapons of Stone Age Man (Bourlière 1966:43-53). The preceding environmental resource base discussion must be related to past climatic changes, if past human behaviour is to be elucidated. It is only by knowing what late Quaternary palaeoclimates were that we can estimate the carrying capacities of the environments during the Late Stone Age period.

For the present study we are interested in the terminal Pleistocene and Holocene. The most determinant climatic factor influencing the biotic life in the tropical macroenvironments is rainfall, its amount and distribution throughout the year. However, it is not yet possible to estimate what the past hydrologic package was because present hydrologic parameters are not known. Studies of shorelines, geomorphological, stratigraphical and palaeolimnological evidences may be used to reconstruct past changes of precipitation, and thus, to infer macroenvironmental carrying capacitites.

Evidence from limnological studies, retreat of montane glaciers and studies of downcutting and aggradation of the Nile seem to suggest that the climate in East Africa was drier than that of today between ca. 15,000 B.P. and ca. 12,000 B.P. and this may be said to correspond to Leakey's Kanjeran/Gamblian interpluvial. The findings of Coetzee (1967) and those of Kendall (1969) also suggest that this drier climatic phase may have started as early as 26,000 B.P. (Richardson and Richardson 1972:530-532). The pollen and palaeolimnological record of Lake Victoria shows that there was a shift to some semi-deciduous forest between 7,000-6,000 years ago, perhaps indicating a slightly drier climate. Again there is a reduction of forest cover between 3,000-2,000 years ago. Stratigraphical investigations and C14 datings in Lake Rudolf have shown that maximum water level was reached by 9, 500 years ago as Member IVa was formed. The level fluctuated between about +60 m. and +80 m. until after 7,500 years ago when the lake shrank to its present level. Since 3,000 years ago the level has been relatively low and dropped from +15 m. - 5 m. between 1897 and 1955. The picture in the Nakuru-Naivasha basin is of successive fluctuations. A partial C14 chronology shows a high stand at the beginning of Holocene but the lakes reached their highest levels ca. 9,000 years ago.

At about 3,000 years ago Lake Naivasha almost completely dried up as indicated by a sublacustrine core. Shoreline features belonging to a phase between 10,000 and 8,000 years ago, suggest the level was 180 m. above the modern one. Core evidence from Lake Naivasha suggests that the climate between 9,000-6,000 years ago was warmer than today. During the same time, the lake overflowed and probably continued overflowing until 5,000 years ago and precipitation is estimated at 150 mm. greater than the modern mean. Lake Magadi also seems to have been at a higher level about 9,000 years ago while Lake Victoria was particularly full between 9,500-6,500 years ago. Between 17,000-5,000 years ago the Nile discharge was markedly greater than today but after 3,000 B.C. there has been a downward trend of flood level. M. van Zinderen Baker (1967), and J. A. Coetzee (1967) have suggested that East African temperatures were lower 9,000 years ago and therefore evaporation was lower, hence higher shorelines, but Butzer (1972), Isaac (1972) Richardson (1972) and Washbourn Kamau (1972) have jointly argued that the fluctuations in lake levels are too drastic to be explained by temperatures lower than those of today by a few degrees. Their position is supported by core evidence from Naivasha which suggests that the climate about 9,000-6,000 years ago was somewhat warmer than today's as well as more seasonal (Butzer et al, 1972:1069-1076).

From the above summary we can make the following general observations:

1. That the climate during the terminal Pleistocene in East Africa prior to 12,000 B.P. was drier than that of today, and by inference the vegetation less lush.

2. The climate, especially between 10,000-6,000 years ago, was definitely wetter and possibly warmer too.

3. After 4,000-3,000 years ago, it seems there have not been too many drastic changes in the precipitation, although there have been minor or even major isolated and localized changes, e.g. the dropping level of Lake Rudolf. Dr. Dan A, Livingstone of Duke University, (pers. comm.) also thinks that the climate in East Africa has not changed drastically during the last 3,000 years. He, however, added that in his opinion, the period between 13,000-12,000 had a climate much more like the present one than any other period.

4. Other things being equal, perhaps we can speculate that the vegetation of East Africa was much more lush between 6,000-10,000 or even up to 12,000 years ago than it is today, and that the carrying capacity of the environments was equally greater.

5. Discounting human interference, the carrying capacity of the central Tanzania environments during the last 3,000 years would approximate that of the present day game reserves in East Africa. The palaeohabitat as suggested by the presence of abundant faunal remains at Seronera did not differ markedly from the modern one (Bower 1973:100).

Finally, a word should be said about the peoples of central Tanzania. The peoples of central Tanzania fall into four linguistic groups, Bantu, Southern Cushitic, Plains Nilotes and Khoisan (Sutton 1968:80-81). However, Odner (1971) has disputed this classification and argues for a closer relationship than that implied by the linguistic classification (Odner 1971:155-157), (Fig. 96). According to the linguistic classification, the Wagogo (Dodoma, Manyoni), Warangi (Kondoa), Wanyiramba, Wanyisanzu, Iambi (Iramba district) and Wanyaturu (Singida) are Bantu. The Wasandawe (Kondoa) and Watingdiga (Iramba) are Khoisan, while the Wambulu and Wambugu are southern Cushitics, and the Wakwavi (Dodoma, Singida, Iramba) are Plains Nilotes. Most of these practice agriculture with varying degrees of animal husbandry. The Watindiga (Hadza) were until ten years ago basically hunter-gatherers, whereas their cousins, the Sandawe, have now made agriculture an important compontent of their subsistence. The Wakwavi are basically nomadic, herding cattle and a few sheep and goats.

Central Tanzania environments, therefore, it may be argued, offered Late Stone Age man ready sustenance by their rich biotic carrying capacity, but the diversified physical terrain may also have been an important factor, making available a wide range of home or camp bases. Ethnographic evidence and oral tradition attest to the use of rock shelters and caves for purposes such as home or camp bases, workshop areas, sanctuaries for magico-religious functions, refuge camps in times of warfare, or hideouts for game. Indeed some of the contemporary local groups, as it will be pointed out in subsequent sections, still use rock shelters and caves for some of these functions; and there is no reason to doubt that they were used for more or less similar purposes by the ancestors or the precursors of the present tribes.

Summary

The physiography of central Tanzania is largely associated with the tectonics of the Great Rift Valley system. Faulting and tilting have left plateaus and plains studded with several granitoid inselbergs, some of which form rock shelters and caves suitable as home/camp bases or other purposes for the Late Stone Age people. Local altitudinal variation influences the climate, which in turn influences the vegetation. The present vegetational patterns of bushland and wooded grassland and the climate have remained more or less the same for the last 3,000 years. It is therefore argued that the biotic carrying capacity of the undisturbed central Tanzania environments has not changed much and that it would approximate that of the present day game reserves in East Africa.

CHAPTER 2

THE SITES

The physical setting of the four sites described here may loosely be referred to as cave sites sensus lato, in contrast to open air sites. Two of the sites are rock shelter sites and the other two are exterior caves[8] sensus stricto, but in either case, the outcrop rock is a granite. For the purpose of this disseration, only those properties of granites which may be useful in studying the sites will be mentioned.

Granite is an acid plutonic rock whose range of mineral composition is relatively limited. Basically, it is a coarsely crystalline rock consisting of quartz, a feldspar and mica, in many instances biotite, though this mineral and muscovite commonly occur in close association. Due to the relative stability of these minerals, granites are generally resistant to weathering. However, when weathering takes place, plagioclase and biotite are the first minerals to show signs of decay. The process is fairly complex, but biotite undergoes hydration and changes to hydrobiotite and vermiculite and eventually to one of the chlorites. Iron is released during these changes and combines with oxygen to form haematitic iron which imparts

[8]Butzer (1971) distinguishes two major kinds of caves; exterior caves and niches and interior passages and caverns. Exterior caves may vary from simple overhangs and shelters to shallow caves. Those in central Tanzania have been produced by hollowing out of the softer rock strata and by differential erosion of the area surrounding the rock shelter.

the red coloration to weathered granite as observed at Majilili 2B site, described later in this chapter. Thus the degree of concentration of the different minerals affects the resistance to weathering. Abundance of biotite and plagioclase with reduced concentrations of quartz and microcline combine with coarseness of texture and porosity to make a granite readily weathered. On the other hand, granites that are fine textured, and less porous, and contain more quartz and microcline than biotite and plagioclase, are resistant to weathering. In general, granites, whatever their composition, are more susceptible to weathering under tropical conditions (Twidale 1971:7-8). It is the coarse grained varieties which have suffered greatest disintegration and have given rise to rock shelters and exterior caves as found in central Tanzania.

Kandaga A9 (4°33'S, 35°46'E).

Kandaga A9 rock shelter (Fig. 5), is located on the north-eastern slopes of the Masai escarpment overlooking the once game-rich Masai steppe. The site is about 27.5 km. from Kolo and easily reached by car. It is among a chain of rock painting sites separated from each other by bush-covered hill slopes and granite outcrops. Like the second site, Majilili 2B, it is in the country of the Warangi tribe, but the upper levels of the escarpment are inhabited by a linguistically different people known as the Wafiome or Wambulu.

Being on the very low slopes of the Masai escarpment, it

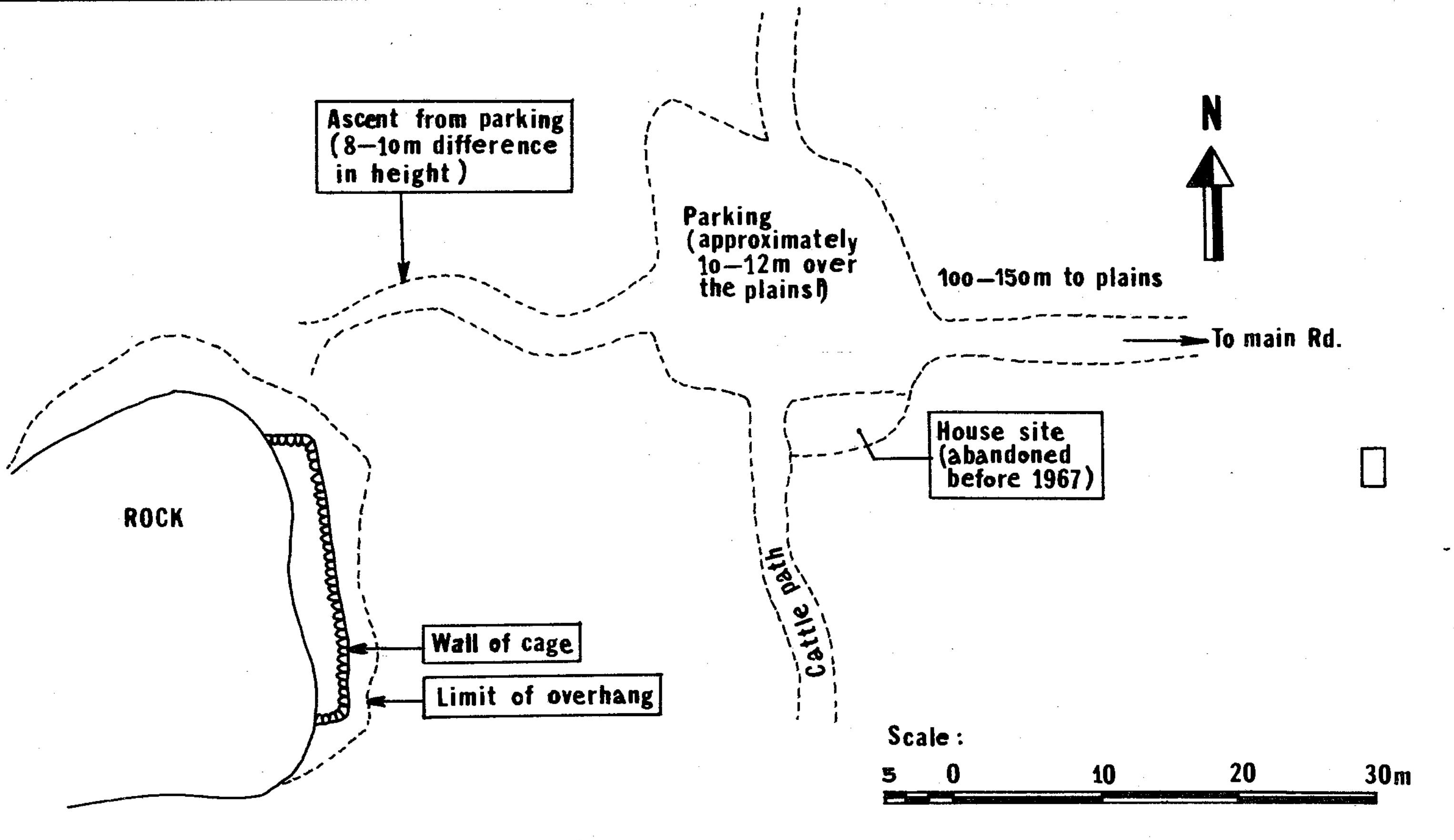

Fig. 5 Sketch of Kandaga (A9). Rock shelter and surrounding area

lies within the upper reaches of cultivatable land tilled by the Warangi. The site is formed by an east facing rock shelter, 26 m. long by 5 m. high with an equally impressive overhang which is so low in the northeastern part of the shelter that a cave is formed (Fig. 6). It is in the midst of a dense vegetation composed of thorn bush, lianas and a few huge trees, at one time the natural habitat of such animals as the rhinocerous, eland, kudu, warthog, dikdik and monkeys. The only animals that inhabit the vicinity today are dikdiks, warthogs and monkeys; the latter two partly subsisting on cultivated plants and are therefore considered a menace to local peasants.

The upper part of the overhang is dome-shaped but in some parts the rock is covered with enough earth and fallen decayed leaves to support small bushes and trees. A few meters below the shelter are cultivated fields of corn, eleusine and millet, which make up the bulk of local peoples' diet. The fields are also studded with huts which together constitute the village of Kandaga. To the north and about 2 km. away is the village and the Catholic mission of Itololo. The area has enough water from springs and the Kandaga River, which, although dry during most of the year, has a high enough water table for water holes to be dug without too much difficulty. During the wet season, the source area of the Kandaga River is swampy and its catchment area overlaps with that of the Itololo springs to the north. Otherwise, there is a definite watershed between the two catchment areas. Drainage is naturally toward the

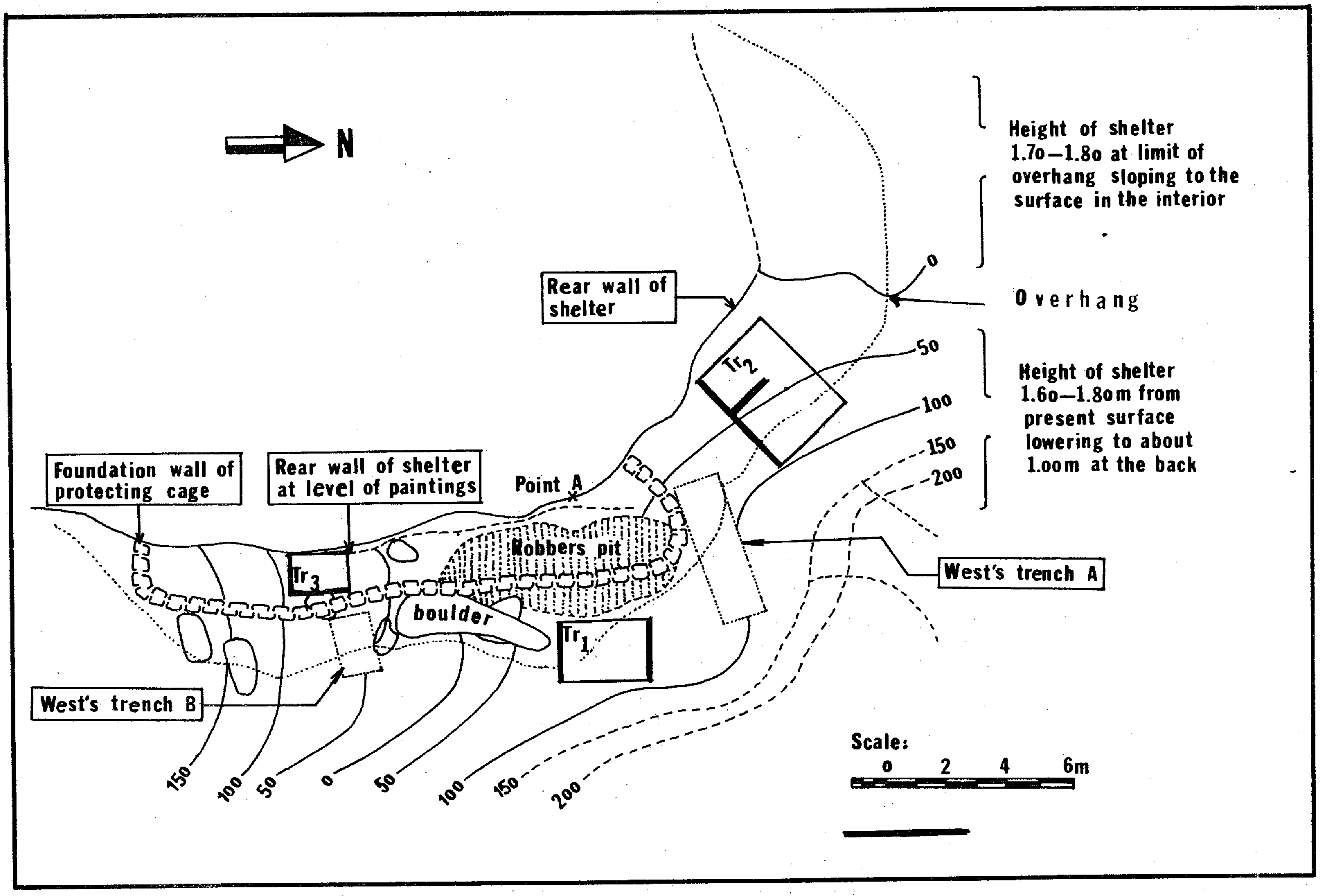

Fig. 6 Plan of Kandaga A9 Rock Shelter showing the location of trenches I, II & III.

plains which are liable to be waterlogged during the rainy season.

Kandaga A9 was chosen for several reasons: The vertical rear wall of the shelter is covered with a profusion of "late white" paintings, the most striking form being a "grid-iron" having squares filled with dots, but there are also hand and finger prints, irregular manders, "sun-symbols" and a dragon (Fig.85). Beneath and obscured by the white paintings are traces of earlier styles in red and purple. These include a small elephant, two ostriches in red, a large pachyderm, and an eland in red outline. In addition, there are traces of broken yellow ochre lines. The site was known to have stratified archaeological deposits. Stanley West (Annual Report of the Antiquities Division 1962) dug two trenches in 1962, but other than his very brief report, nothing was known about the nature of the stratified deposits. The site is accessible by car, thus making it easy to transport working equipment. Its extensive area was also a factor favouring excavation as it may be used for estimates of population size. Thus, by assuming that the habitation area of the site is that part protected by the overhang (approximately 125 square meters) and by using the formula suggested by Binford (1968) (one person per 10 sq. m. for hunter-gatherers), one could arrive at an estimate of 12 individuals living or camping at the site at one point in time. It is, however, conceivable that the area immediately outside the drip line of the overhang may also have been used for other activities. It is with this in mind that excavation trenches were located.

The Excavations

An arbitrary datum point A was established on the rock shelter wall 80 cm. from the floor. The locations of the three cuttings, trenches I, II and III are made with reference to the datum point. (Fig. 6).

Trench I: 4.68 m. due east of Point A and just outside the drip line, a 2 x 1.5 m. trench was dug. Excavation was in natural levels and dirt was screened through a 1/4 inch wire mesh.

Stratigraphy: Archaeological Occurrences:[9] (Fig. 7)

The top layer varied between 15 and 45 cm. thick. It was a rather loose clay mottled with rich black humus. Artifact recovery was generally low and predominantly of Iron Age materials (pottery, slag, *tuyères*, *daga*) although a few LSA microliths, occurred in the lowest 10 cm. The first 35 cm. therefore represent the 1st occurrence and the last 10 cm. with microliths, the second occurrence.

The second layer which corresponds to occurrence 3 was divided into layer 2A and 2B based on presumed differences in artifactual content, but the division will be ignored because it was discovered there was no real difference in the artifacts. It was a dark brown silty clay

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[9] An archaeological occurrence is the smallest cultural stratigraphic unit that can be defined at any one place. The concept includes both the natural context and the artifacts that together form the aggregate(s) within this context (Clark and Kleindienst 1974:73)

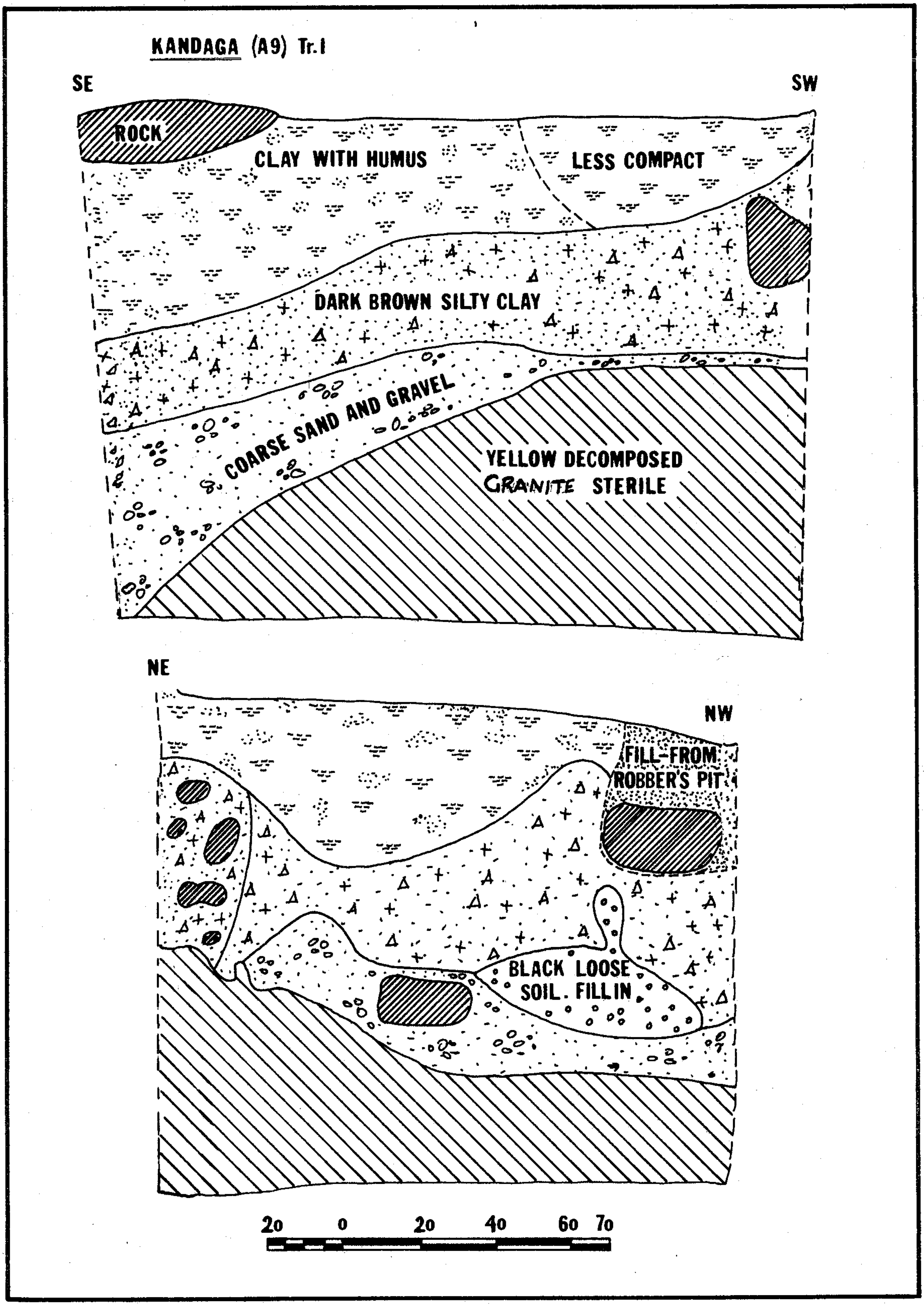


Fig. 7 Kandaga A9 Tr. I. Profiles of the south east-south west and north east - north west walls.

about 35 cm. thick and slightly dips to the east. The profile (Fig. 7) shows a disturbance in the northwestern part of the trench which probably is part of a robber's pit. This disturbance may account for the presence of slag and pottery in this part. Finds include various types of lithics, faunal remains and polished ochre. The latter are referred to as pencils by Inskeep (1962:254) and Leakey (1936).

Layer 3, 25 cm. thick, is predominantly coarse sand but also contains a fair amount of gravel. Artifacts and faunal material continue to appear but at a diminishing rate with depth. Layer 3 corresponds to occurrence 4. Layer 4 is a brown, almost yellowish soft sand mottled with decomposed granular granite. It is devoid of cultural material. At a depth of 1.30 m. further digging was stopped as there was no doubt that the friable decayed granite was sterile and formed part of the bedrock.

In general, the stratigraphy showed a well marked eastward dip and conforms to the natural slope of the local area. Other than the disturbance in the northwestern corner of the trench, the deposits appeared undisturbed. Finds are listed in Table 1.

<u>Trench II</u> A 4 x 3 m. trench was cut 11.30 m. north, northwest of the datum point A. This part of the shelter, unlike either trench I or trench III would be considered marginal for archaeological deposits as it is away from the central and best protected area of the shelter. The overhang in this part was relatively low, being only 1.70 m. above ground level and was

covered with soot as if some recent activities had taken place there. However no fire-places were observed on the ground. Its location was thought ideal for the purpose of estimating horizontal activity patterning and thus site size.

Stratigraphy: Archaeological Occurrences (Fig. 8a, b). The deposits in this part of the shelter were over 6.0 m. thick and in this way reminiscent of the deposits of Kisese rock shelter, where cultural deposits were found scanning a depth of more than 20 feet (Inskeep 1962: 253). Kisese rock shelter is one of a chain of rock painting sites on the lower eastern slopes of the Masai escarpment, 4 km. east of Kandaga A9. Unlike Kisese shelter cultural deposits at trench II Kandaga A9 were comparatively few, some of the strata being sterile. Excavation was conducted in part by natural layers.

Layer 1 consisted of a loose dry brown clay. Humus was minimal, presumably due to the low lying overhang which keeps away falling leaves. It was roughly 15 cm. thick all round and slightly dips to the south. A few potsherds of recent origin and pieces of bone, too fragmentary for identification, were recovered. These belong to occurrence 1.

Layers 2 and 3 were mistakenly dug together in spite of the friability and looseness of the latter. A few potsherds and some bone were found throughout. Other than one obsidian flake, there were no lithics. These correspond to occurrences 2 and 3. A hearth was found on the contact of layer 2 and 3, towards the eastern half of the trench, hereafter referred to as hearth no. 1. The hearth was at a depth of 25 cm. from the

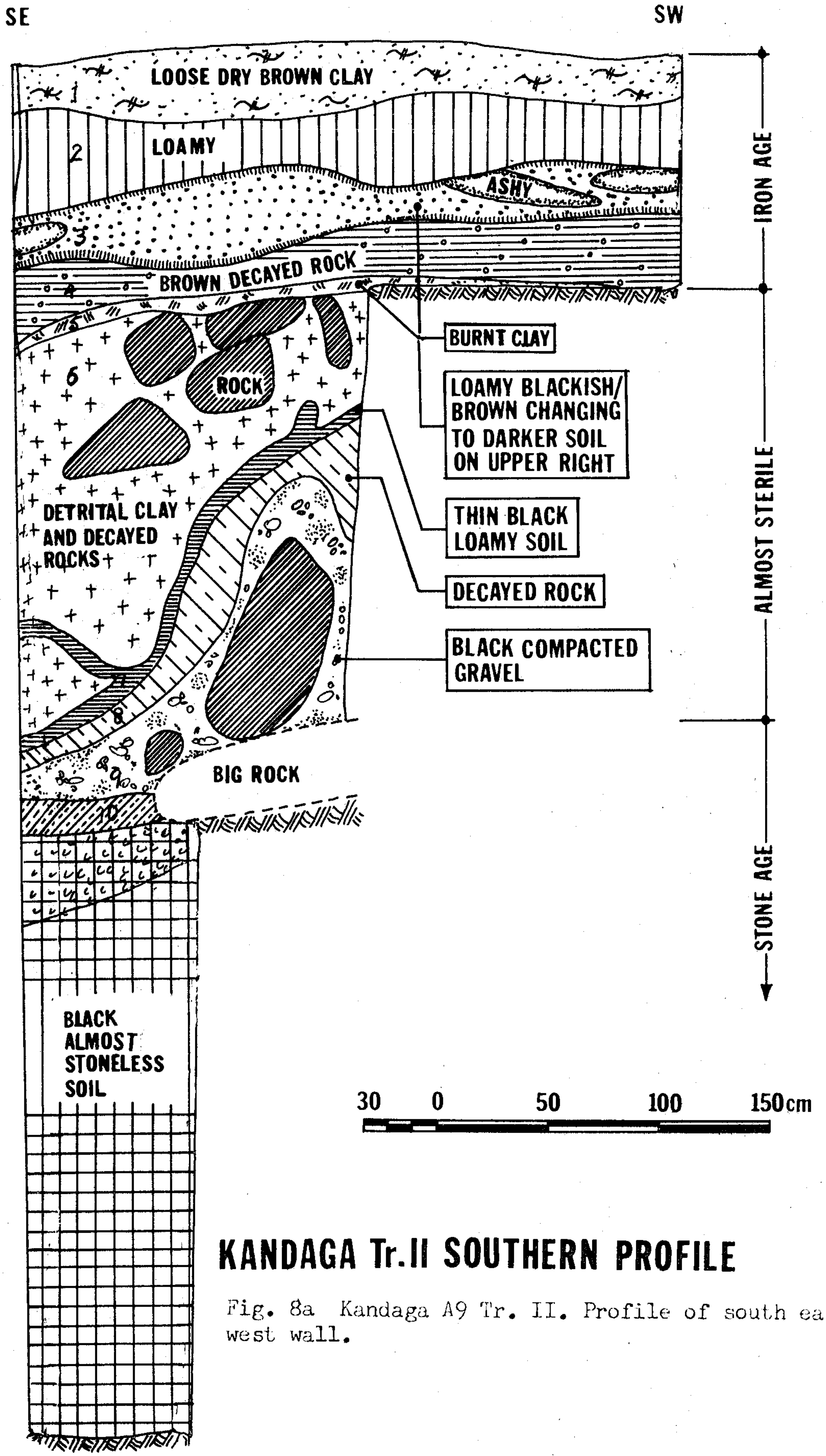
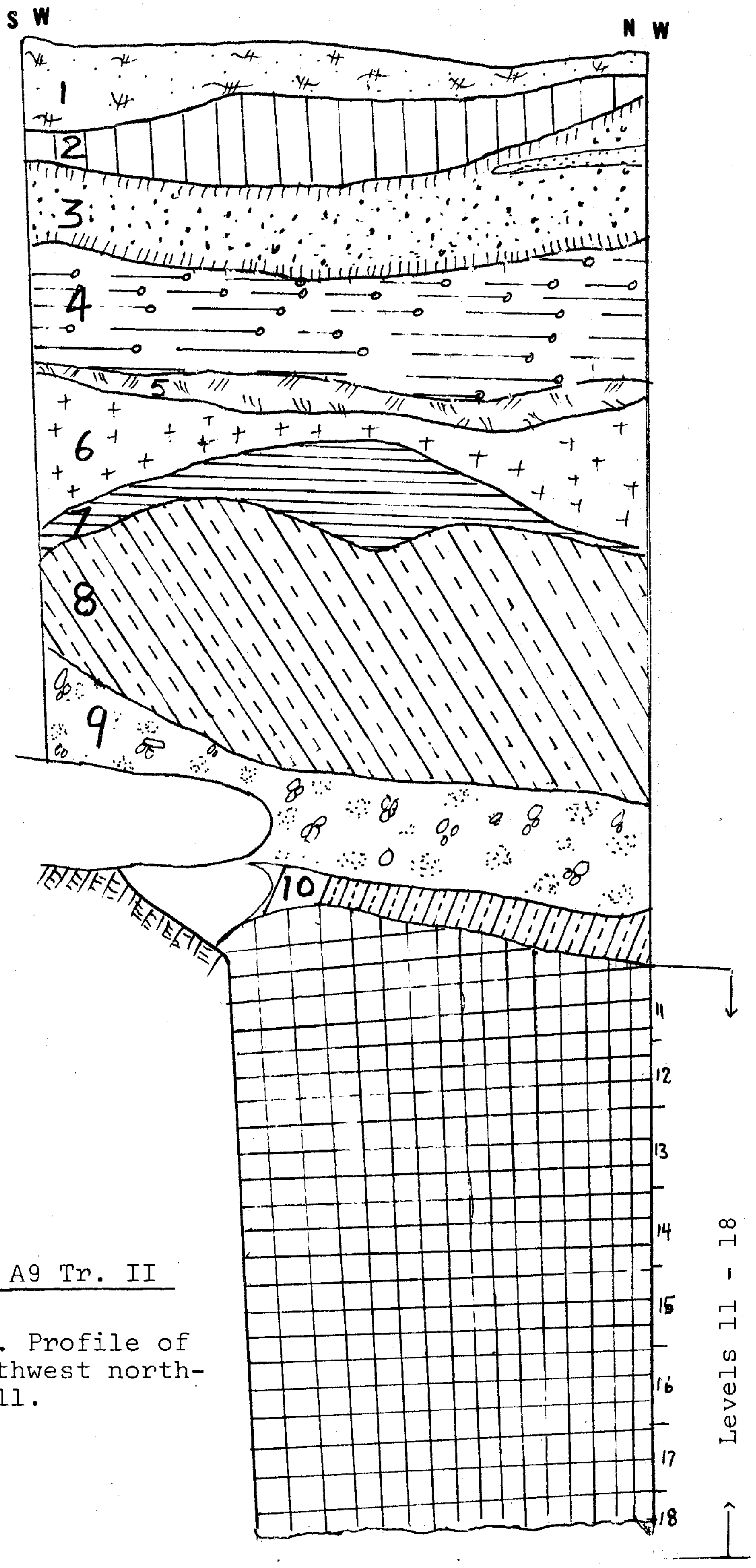


Fig. 8a Kandaga A9 Tr. II. Profile of south east- south west wall.



KANDAGA A9 Tr. II

Fig. 8b. Profile of the southwest north-west wall.

top of the trench. Layer 4 was very much like the overlying one in compaction, but there was a distinctive change of colour from black to buff. At a depth of 40 cm., another hearth (hearth no. 2) was uncovered. The hearth was covered by a slab of rock which at first sight looked like an anvil, but later was found to be a lower grinding stone lying upside down. It was of a type different from another one which had been discovered lying on the surface. It had a smaller depression, measuring only 35 cm. in diameter. Layer 4 corresponds to occurrence 4. The lower part of layer 4 overlies an almost continuous lens of red burnt clay, (layer 5), perhaps associated with hearth no. 2. Potsherds, tuyères, slag, bone and some lithics, mostly angular waste, were recovered. These belong to occurrence 5. A C14 date of less than 200 years B.P. based on charcoal from the hearth has been obtained, but the implication of the C14 dates will be discussed later. Nevertheless, the date quoted above would be too recent to be accepted for the Late Stone Age assemblages, though it may represent the antiquity of Iron Age at Kandaga A9.

Below the interbedding of the thin burnt clay is layer 6, an admixture of clay and detrital stuff intercallated into decayed rock and corresponding to occurrence 6. Hearth no. 3 was found in the middle of the trench directly below hearth no. 2. A few lithic artifacts, pottery, slag and bone were recovered but the horizontal distribution was variable. Artifacts and faunal remains were only found in the regions where clay predominated, otherwise the regions of decayed rock were almost sterile.

Layer 7, was a thin black loamy soil, dipping to the southeastern end of the trench. As may be suspected, it was sterile, but in order to find out whether there was still a cultural layer overlain by layer 7, the eastern half of the trench was excavated. Overlain by layer 7 was a black compacted layer of decomposed rock identified as layer 8 and occurrence 7. In the localities where decomposed rock was rare, lithic artifacts were recovered. Further down, the consistency is broken by a sudden reduction of the gravel and decomposed rock, but the compaction increases, evidently due to some thin intercalations of silty clay and the pressure exerted by the boulders in the layer above. Lithic artifacts and detritus were recovered from the interstices of the boulders. At the southeast corner the depth was 3.40 m.

The next, identified as layer 9, was composed of compacted gravel and granular rocks. A few lithics were found from occurrence 8. Overlain by this was a brownish firmly compacted silty clay with many boulders some of which were decayed (layer 10). At the depth of 4.00 m. toward the southeastern end it thinned out to the next layer. One hammerstone and a few lithic wastes were the only artifacts recovered. Finds from layer 10 belong to occurrence 9.

The next 11-18 levels were composed of various shades of black, almost stoneless soil. These levels are conveniently summarized together as stratigraphical differences between them were so negligible that other than occasional intercalations of different soil colours, their separation would be difficult. Artifactual recovery was very low. Eight 30 cm. arbitrary levels, each of which was designated as a single occurrence, were created. Lithic material continued to occur but with low and erratic frequency. In levels 13 and 14, termite runs were observed but the significance of this is not yet known. Overall, artifact recovery seemed to decrease with depth.[10] At 6.40 m. it was decided to stop digging further down as it was not only getting increasingly dark, but there were also risks of a possible cave-in. Sterile sand was not reached, but the density of artifacts being recovered was becoming so low (1-2 possible artifacts per a 60 x 45 x 8 cm. screenful) that it is doubtful further digging would significantly alter the results. In terms of relative and absolute artifact count, trench 2 was the poorest of the three cuttings in spite of being the largest and also having the deepest deposits. Finds are listed in Table 2. Table 4 compares the artifactual recovery from the three trenches.

Trench III A 2 x 1.4 m. trench was dug 8 m. south of the reference point A. Of the three, this was nearest to the shelter wall and indeed the most ideal for fallen slabs that might shed some light on the dating of the rock paintings. The western part of the trench had been slightly eroded by a southwest-

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[10] This could be better demonstrated by calculating the number of artifacts found per cubic volume of excavated deposit within each occurrence or spit, but for the present purpose it was deemed unnecessary.

northeast running channel. Excavation was conducted in arbitrary levels of 10 cm. each, each of which was treated as an occurrence, and at its completion, 6 main natural layers were recognized. (Fig. 9).

Stratigraphy The top soil, (layer 1), predominantly clayey, was full of pottery, bone splinters and lithic artifacts. Below the top soil was an admixture of loose gravel and stones in a matrix of hard clay, (layer 2). Pottery, bone, a piece of brass wire, and a considerable amount of lithic material, mostly quartz but with a few obsidian[11] and chert flakes, were found. Layer 1 was the thinnest, being only 10 cm. deep, but layer 2 was about 25 cm. thick.

Layer 3 was generally silty-clayey, with interfused rocks and gravel. The clay gradually and imperceptibly changed into a rather loamy soil increasing with depth. Layer 3 was 0.8 m. thick and was divided into 8 arbitrary levels. Lithic arti-

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[11] The probable source of the obsidian is not know for certain, but Mr. Mturi, the Director of Antiquities (pers. comm.), confirmed that the nearest known source of obsidian would be ca. 150 km. in the highlands of Arusha Region. Obsidian is for example the predominant raw material at Apis rock and is found in significant proportions in Ngorongoro and West Kilimanjaro sites. Nelson (1973), has pointed out that the distribution of obsidian in East Africa appears to diminish rapidly eastward from the rift valley in central and southern Kenya and northern Tanzania, and that it rarely occurs more than 50 km. from the source. He suggests that the failure to trade obsidian widely reflects either, (1) a general lack or (2) widespread ritual or social prohibitions against trading obsidian. While the former is the more likely of the two, the presence of locally available substitutes such as cryptocrystalline quartz and quartzite would definitely render obsidian trade less desirable. Obsidian is less rare in the Isanzu sites of Kwa Mwango and Kirumi, perhaps due to the fact that these sites are closer to the obsidian sources in Ngorongoro than the Kondoa sites of Kandaga and Majilili.

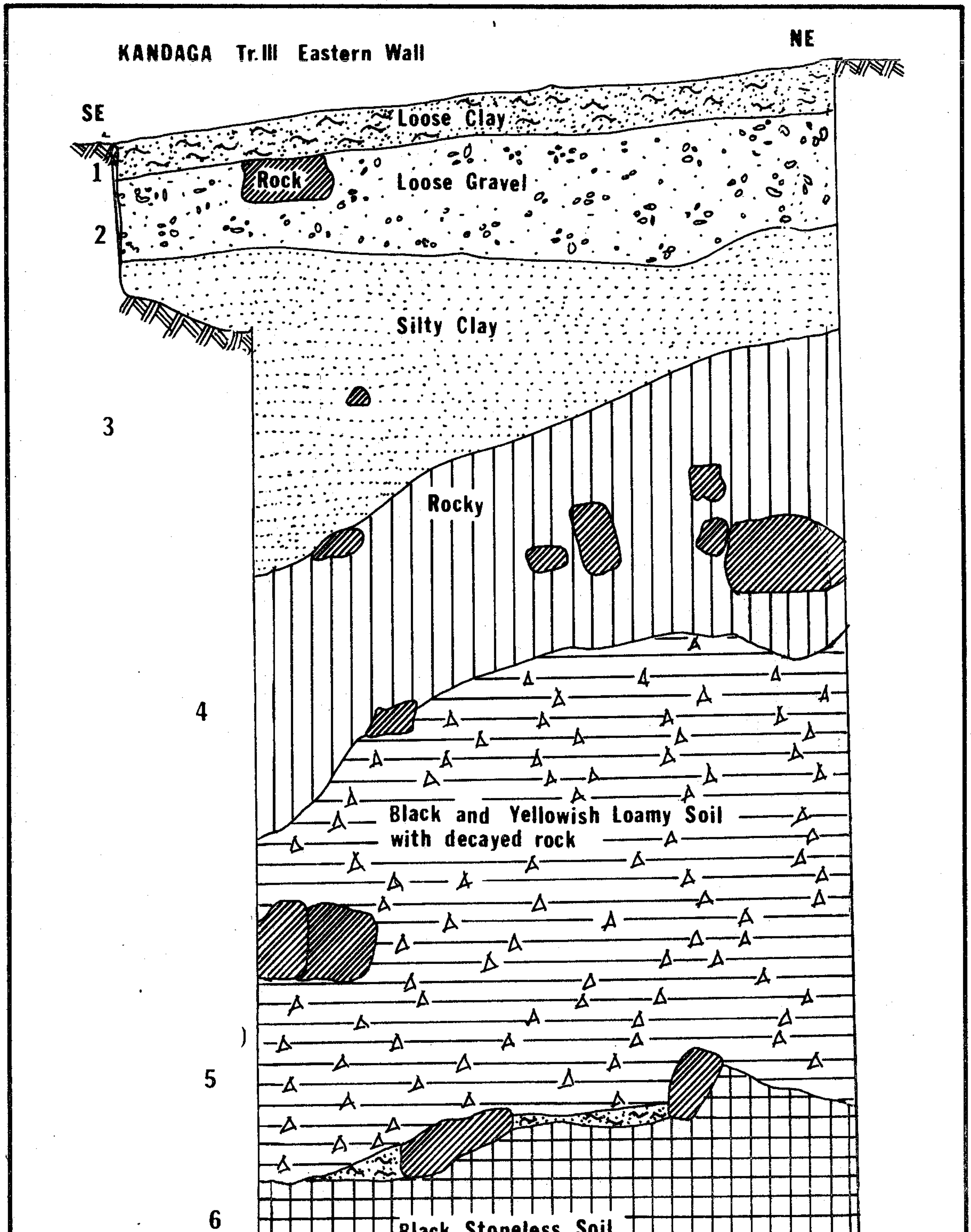

Fig. 9a Kandaga A9 Tr. III. Profile of the south east - north east wall.

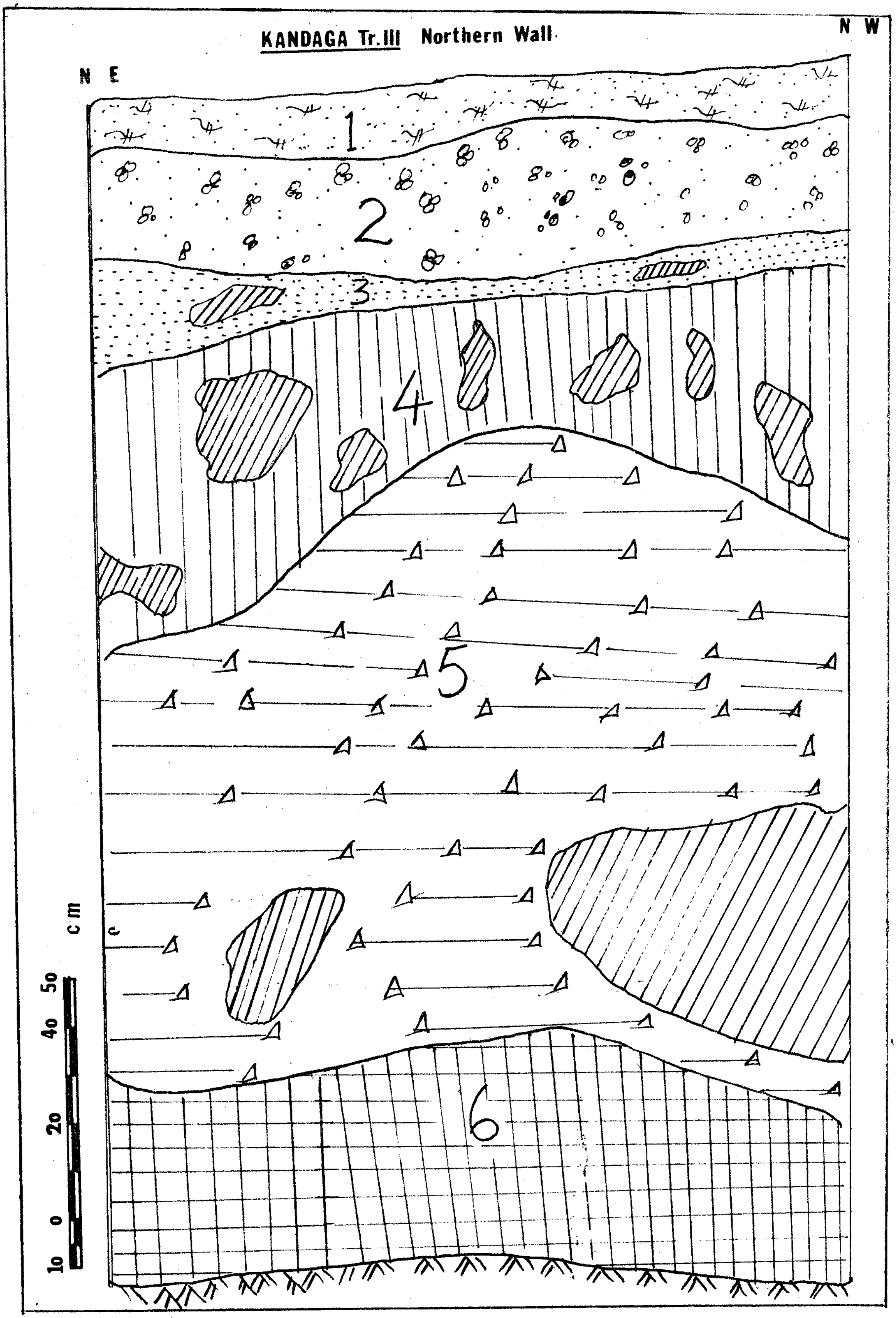

Fig. 9b. Kandaga A9 Tr. III. Profile of the northeast northwest wall.

facts occurred throughout. The concentration of artifacts seemed to diminish with depth, though not as drastically as in trench II (Tables 2 & 3). Several polished pieces of ochre and a considerable amount of sandstone and quartz boulders were found. The sandstone boulders were covered with red oxide which scrapes off easily and makes a reddish-brown paint. These were thoroughly washed and examined in an attempt to find possible striations suggestive of scrapings for paint base, but without success. The only other feature worthy of note was the presence of large slabs of rock which seem to have fallen off the rock shelter and its overhang. Attempts to fit them into possible scars and examination for paint were unsuccessful. It should also be mentioned that a great number of large (greater than 15 cm. at maximum extension) quartz/quartzite cobbles with battered edges, possibly hammerstones, were found in the lower levels. A few of these were collected but most of them were counted and left on the site. Layer 3 was taken to a depth of 1.32 m.

Layer 4 was best identified by the presence of many rocks which were almost uniformly distributed. In the western half of the trench, black, wet and compacted loamy soil predominated, but on the eastern half it tapered out and was replaced by a thick lens of gravels and firmly cemented concretions. The former was implementiferous; the latter was sterile. In the first three 10 cm. levels, battered spheroids occurred. Small pieces of bone were also recovered. At a depth of 1.95 m. it was observed that the wet, black loamy soil was becoming more extensive until it almost filled the whole trench. This was identified as layer 5. However, the black loamy soil was gradually replaced by a yellow-brown fill and increasing amounts of decayed rocks. Artifacts continued to occur. At 2.7 m. a layer of black stoneless soil, identified as layer 6, was exposed. However, further digging was soon to be stopped by the presence of huge slabs of rock across the trench. These seemed to have fallen from the rock shelter. They could not have been part of the bedrock because instead of dipping to the west, as did the parent bedrock of the shelter, they dipped to the east. They also looked too fresh to have been part of the bedrock because both in trench I and at Majilili 2B, the top part of the bedrock was fairly decayed. However, they were so big that it was impossible to move them. Although the density of artifacts was not worked out, artifacts do not diminish with depth as much as in trench II (Tables 3 & 7). A few of the 10 cm. levels were sterile. Finds from layers 3 to 6 are considered as archaeological occurrence 2. The implications of the spatial and temporal distribution of artifacts at Kandaga A9 will be discussed later on.

Dating

Several charcoal and bone samples were collected for C14 dating, but at the time of writing only five C14 dates are available. (see Table 37, Chapter 4). Three of the samples are charcoal all collected from trench II: two from hearth no. 2 layer 4; and one from hearth no. 3 layer 5. The C14 dates for these are: modern or less than 200 years B.P. (Gx-3674); less than 125 years B.P. (Gx-3676); and modern or less than 200 years B.P. (Gx-3675). The hearth no. 2 samples came from a depth of 45 cm. below surface and, as has been pointed out earlier, were associated with Iron Age and Late Stone Age deposits. The third sample from hearth no. 3 came from a depth of 70 cm. and was associated with artifacts of Late Stone Age type, as well as with Iron Age pottery, and tuyères. The fourth sample was bone recovered from 40 cm. down at the top of layer 3 in trench I and has been dated to 3375 ± 180 years B.P. (Gx-3677). The associated artifacts were all Late Stone Age. The fifth was also on bone, but from layer 2, trench III, at a depth of 20 cm. The date for this was reported as modern or less than 200 years B.P. (Gx-3678). The dates are based upon the Libby half life of 5570 years for C14 and are quoted with 95% confidence.

The earlier date of 3375 ± 180 years B.P. not only confirms my suspicion of the antiquity of the lower Late Stone Age deposits, but also seems to agree with the dates from my other two sites of Kwa Mwango (3270 ± 100 years B.P.) (Gx-3679), and Kirumi (3665 ± 140 years B.P.) (Gx-3681). At the site of Lululampembele which is in the same geographical area, Odner (1971) obtained a date of 3830 ± 180 years B.P. (N-787), for the Late Stone Age deposits, while at Narosura, a site slightly north of the area considered as central Tanzania, Odner (1972) obtained dates ranging from 2850 to 2350 years B.P. The deposits at Narosura are Late Stone Age associated with stone bowls. Soper and Golden (1969) have also reported a date of 2640 ± 120 years B.P. (N-493), from a Late Stone Age assemblage associated with pottery at Nyangoma rock shelter in Mwanza, slightly west of the area considered in this study. The lithic assemblages from these also seem to be typologically contemporaneous with those from Kandaga A9. Unfortunately there are no other published dates for rock shelter deposits or any Late Stone Age sites in central Tanzania for comparison except those of the nearby Kisese II rock shelter. There, a C14 date of 18,190 ± 306 years B.P. (NPL-37) has been obtained for an assemblage transitional to the Late Stone Age from one of the earlier scraper-rich occurrences (Nelson 1973:34). The earlier date at Kandaga A9, as the dates for Kwa Mwango and Kirumi seem to represent the true antiquity of the terminal Late Stone Age in central Tanzania, indeed for East and Central Africa in general (see Chapter 4).

The modern dates are less intriguing than it might appear at first. It is argued that they too represent the true antiquity of the Iron Age deposits at Kandaga A9. However, they must be understood as marking the end of a cultural continuum starting from the terminal Late Stone Age to late Iron Age. The associated artifacts consist of pottery, _tuyères_, slag, a piece of brass rod and a badly rusted metal spear head. The pottery is not of early Iron Age type. The earliest types of pottery in East Africa are the Dimple-based, Kwale, Lelesu and Kansyore ware dated to between A.D. 100-300 (Clark 1970; Schmidt n.d.; Sutton 1968; Odner 1971; Soper and Golden 1969). Although Nelson (1973:49) has reported two dates of 925 ± 150 B.P. and 125 ± 150 B.P. (M-1113) respectively from stratum 3 and 4 at

Nsongezi rock shelter in Uganda, only the later date is associated with Kansyore and Dimple-based pottery. There is no doubt the sample was contaminated. The Kandaga pottery like most late Iron Age pottery is characterized with incised decoration in hatched bands, rouletting and comb stamping (Fig. 10a,b,c). The earliest known date for rouletting in East Africa is in the twelfth century, obtained at Uvinza, but the technique is still used in central Tanzania (Odner 1971:62).

So far no dates have been obtained to indicate at what point in the Late Stone Age - Iron Age continuum contact between the two may have taken place, but from the Late Stone Age - Iron Age cultural history of East Africa contact may have taken place any time after A.D. 100. At Kirumi, for example, a date of 740 $\pm$ 150 years B.P. (Gx-3682) was obtained from a horizon below which there were no Iron Age artifacts and could very well indicate the time of contact between the hunter/gatherers and the iron making agriculturists. It is more than likely that contact situations differed from one place to another. In some, the Early Iron Age replaced the Late Stone Age fairly quickly; in others the two coexisted together for a long time and finally and gradually Iron Age replaced the Late Stone Age, which may even have survived into Late Iron Age or recent times. The nature of archaeological deposits, i.e. the depth and composition of the deposits may reflect the nature of the contact situation. In Zambia, for instance, the earliest date for Early Iron Age occurrence is at Machili where pottery identified as Situmpa ware was found in a horizon dated to A.D. 96 $\pm$ 212

(C-829) (Miller 1969:82). However, some parts of Zambia did not experience Iron Age until much later as at Nachikufu, where the horizon from 1.5 to 2 m. contains completely Late Stone Age assemblages without Iron Age elements. This is dated to A.D. 890±95.(Y-799). The earliest Iron Age date of A.D. 1750±100 (Y-796) comes from the level overlying the furnace and has been taken as the first introduction of Iron Age at the site (Miller 1969:83). The situation in central Tanzania rock shelter sites as shown by the dates from Kandaga, Kwa Mwango and Kirumi is probably more or less similar in that Iron Age seems to have been introduced very late, probably after A.D. 1500.

The association of Late Stone Age and Iron Age types of artifacts at Kandaga and other sites in central Tanzania is not at all unique. The literature is replete with instances of two technologically different cultures coexisting. Hutterer (1974) has reported that in tropical Southeast Asia, groups of widely diverse subsistence systems and levels of sociocultural complexity coexisted within limited geographical areas, as for example in the Philippine lowlands where a number of sites have yielded flake tools associated with earthenware and/or Asiatic trade ceramics. At Makwe rock shelter in eastern Zambia, Phillipson (1973) reports that the later levels yielded evidence for contact between Late Stone Age and Early Iron Age people, and the occupation of the shelter from the beginning of the Christian era to recent times is well attested. Furthermore, Phillipson (1972) has again shown that evidence from Luano, Chondwe, and other rock shelter sites, suggest that the production of stone artifacts of Late Stone Age type continued at least in parts of the Copperbelt for some time after the arrival of the Iron Age.

> It is possible that in the Chondwe area, this stone technology may have survived until after the introduction of the later Iron Age pottery style. Similar survivals are well attested in northern and eastern Zambia but appear to have been less frequent in the Lusaka area and in the Southern Province. It has been argued that this phenomena indicate the survival of the Late Stone Age people practicing their traditional technology, alongside the contemporary Iron Age immigrants ... Phillipson 1972:118.

In conclusion, the survival of Late Stone Age technology to Late Iron Age at Kandaga and in many central Tanzania rock shelters is not at all surprising, especially when it is realized that part of central Tanzania is the home area of the Khoisan speakers, the Sandawe and Hadza who until recently subsisted on hunting and collecting wild fruit, roots and honey. Their contact with Iron Age people may have taken the form of peaceful trade as suggested by the presence of pottery, rare metal objects, agate and quartz beads in later Stone Age sites and of shell beads and bones in Early Iron Age sites. The paucity of scenes of warfare in the rock art seems to lend credence to the view that the contact was by way of peaceful trade. Iron Age people may also have traded some of their metal implements and pottery for honey and game (see also Miller 1969:86). Indeed, even today there are still some lithic using groups whose weapons may be tipped with iron but, who use stone tools for several functions. The Bushmen of South Africa and some Australian Aborigine tribes are the largest such groups extant.

The Assemblage[12] and Associated Finds (Tables 1-8).

The lithic assemblage at Kandaga A9 manifest some local features, unique and different from contemporaneous assemblages in other sites, but also has some sililarities with comparable assemblages of Late Stone Age. The percentage of tools (shaped and unshaped) compared to cores, flakes and debris is more than what would be expected if the whole assemblage were represented by the artifacts from trench I. However, the overall tool recovery of 2.64% makes Kandaga a rather tool-poor site, especially when compared with 3.5% for tools at Lululampembele (Odner 1971: 194), 3.8% for Nsongezi, 6.9% for Kansyore, 4.5% for Nyabusora (Nelson 1973), 8.40% for Nyangoma (Soper et al. 1969) and 4.32% for occurrence E at Lukenya, though comparable to 2.15% for occurrence F at the same site (Gramly 1975). The distribution of the different tool types (Tables 5,6,7) has also some special peculiarities, though not as dramatic. Scrapers account for the greatest percentage of shaped tools not only overall but also in each trench. At Lululampembele (Odner 1971), crescents are the most common tool category followed by outils écaillés[13] and then scrapers, while at Kansyore (Nelson 1971), outils écaillés, scrapers and casually retouched waste form the largest category of tools. At Nyabusora (Nelson 1971), outils écaillés and scrapers account for the majority of the tools and on this basis,

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[12]The term "Assemblage" is used here loosely and at various levels of inclusiveness, and not in a closely defined manner as suggested by Clark and Kleindienst (1974:73).

[13]Clark and Kliendienst (1974:92-93) prefer the term Outils ésquillées to Outils écaillés, but Nelson (1973) prefers the latter. (see also Chapter 3).

the Kandaga assemblages may be said to approach that of Nyabusora. The significance of the preponderance of scrapers is not readily known, but it more than likely connotes some specific activities patterning at the site. This problem is discussed in Chapter 4. Burins, becs, and borers are generally uncommon, while points are altogether absent.

The remarkable predominance of debris especially in trenches II (82.27%) and III (81.21%) together with the variation in artifact density within each occurrence and from trench to trench may indicate "activity areas" or refuse heaps. Thus while trench I was in an activity area, trenches II and III were on the marginal area where either useless debitage was thrown or left after the process of manufacture.

The raw material used is almost exclusively quartz. Both clear and vein quartz were used. It was observed that most of the clear quartz waste had been utilized, thus indicating some preference of raw material. Altogether, only ten pieces of obsidian and six of lava were found in the whole assemblage. Odner (1971) also reports that the raw material used at Lululampembele was almost excludively quartz. Quartz is locally available in many areas in Central Tanzania.

It should be mentioned in passing that the term "waste" as used here is only technical and does not carry cultural connotation. As Mason (1967) rightly observed, a considerable amount of the angular waste in the Late Stone Age industries of South Africa, had either been trimmed or utilized and as such the category forms an important class in the whole assemblage. A high proportion of waste to shaped tools has also been recorded at Lothagan in Northern Kenya (Robbins 1967a:70).

Kandaga is definitely a two component site. The upper strata, as at Kisese, had Iron Age artifacts, pottery, tuyeres (baked clay pipe probably used with bellows), slag, a metal spearhead and a piece of copper alloy. The pottery will only be briefly described here as a detailed report is being prepared by Dr. Liesegang for publication in *Azania*.

Pottery (Fig. 10a,b,c) The four modern dates quoted earlier in this chapter may be accepted for the Iron Age occupation of the site, and as such, the Kandaga ware is definitely later than the 17th century. Dr. Liesegang (pers. comm.) has found the sherds to be fairly uniform stylistically and therefore assumes that they are all contemporary with the hearths from which charcoal for C-14 dates were obtained. While this assumption is backed up by the stratigraphy, the statement about uniformity of style should perhaps be modified in the light of apparent different decorative motifs and techniques. In all cases, the finish was unslipped but smooth; it was probably done by the hand or a polished pebble. As in other Late Stone Age - Iron Age sites no examples of glazed ware were found. Only two types of vessels, viz. hemispherical globular bowls and jars are represented.

Trench I - Layer 1. Four of the eight sherds were rim sherds (Fig. 10a:a-d), one of which belonged to a globular jar and the others to a bowl. In all cases the lips

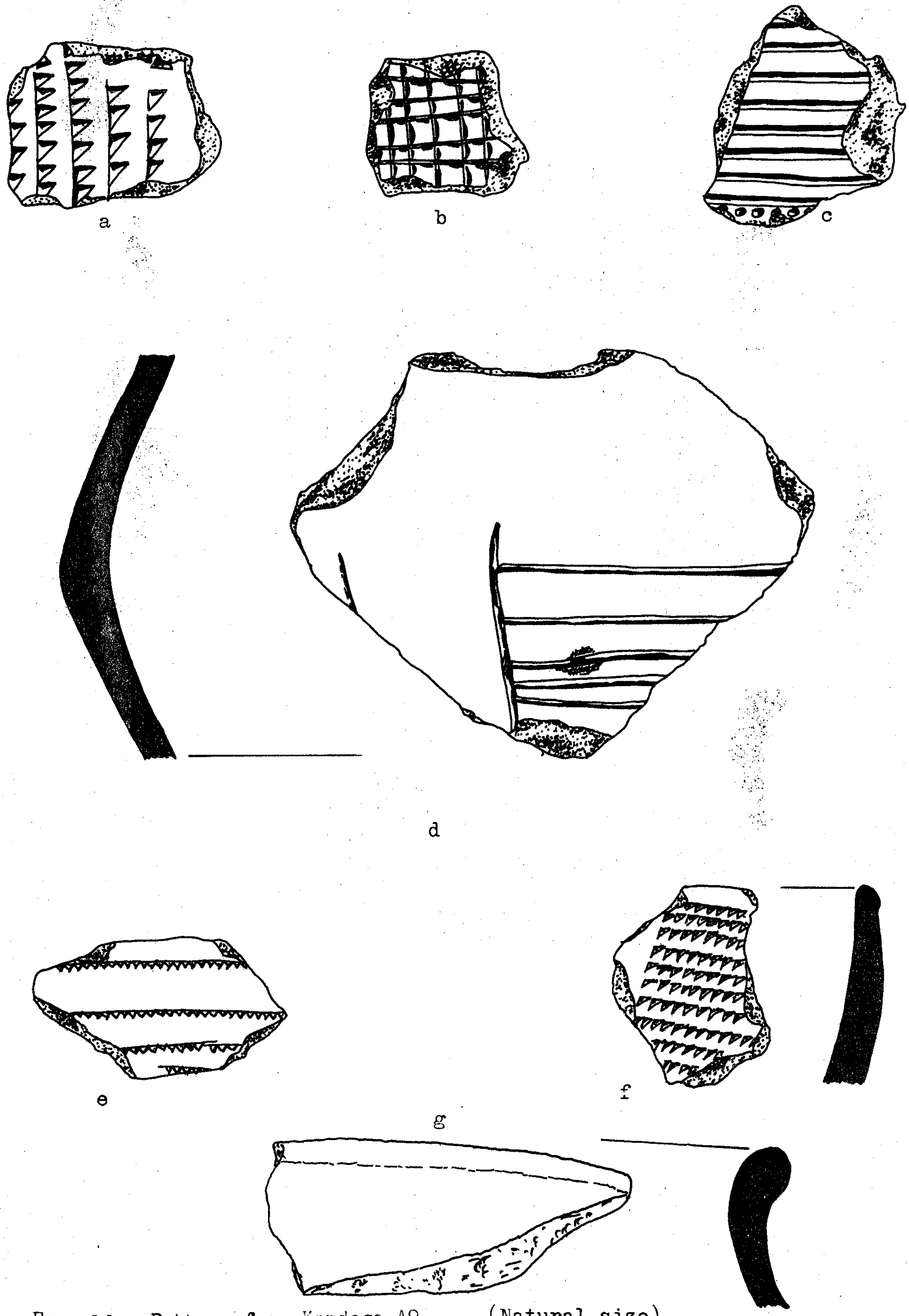

Fig. 10a Pottery from Kandaga A9. (Natural size)

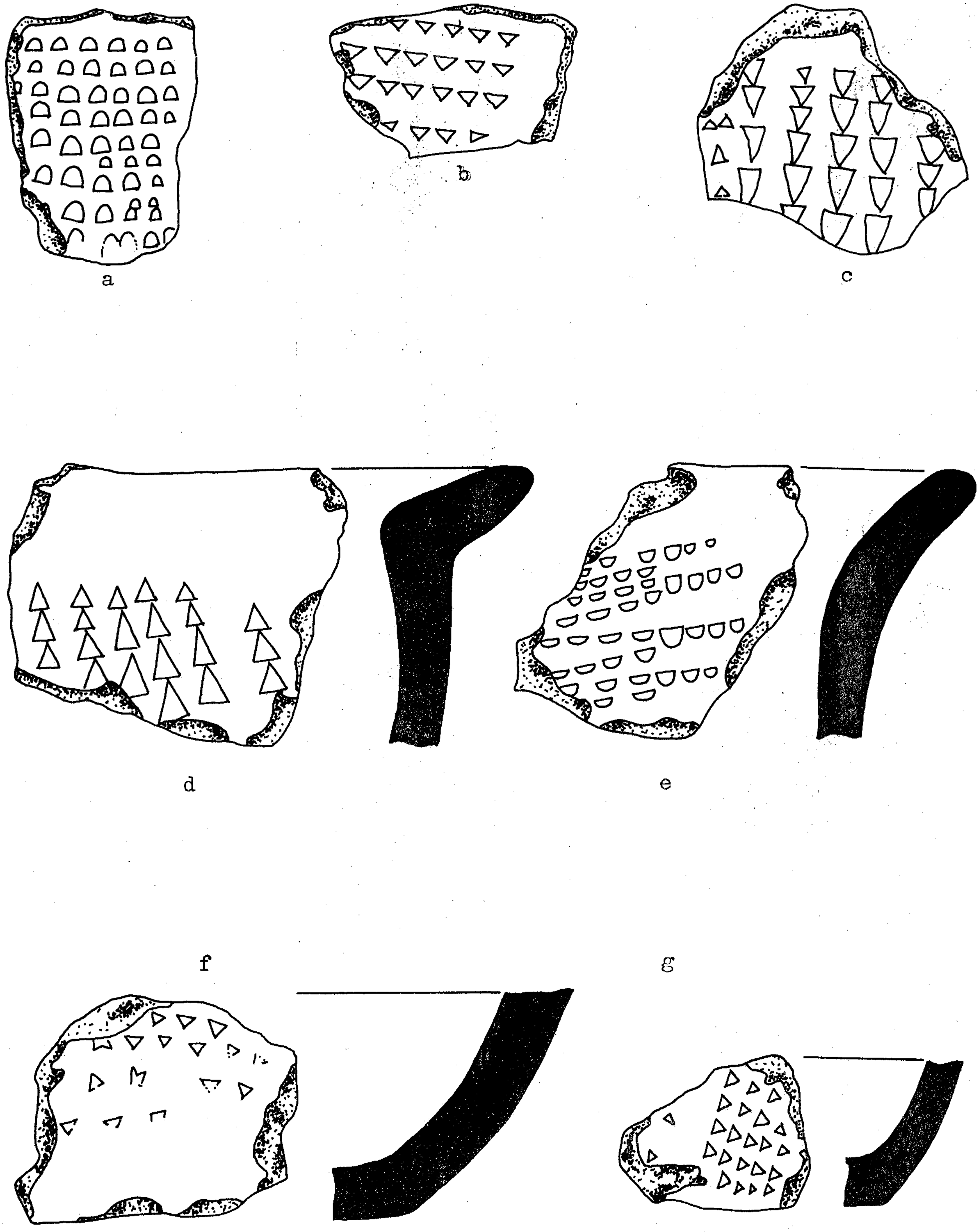

Fig. 10b Pottery from Kandaga A9, Trench I layer 2. (Natural size).

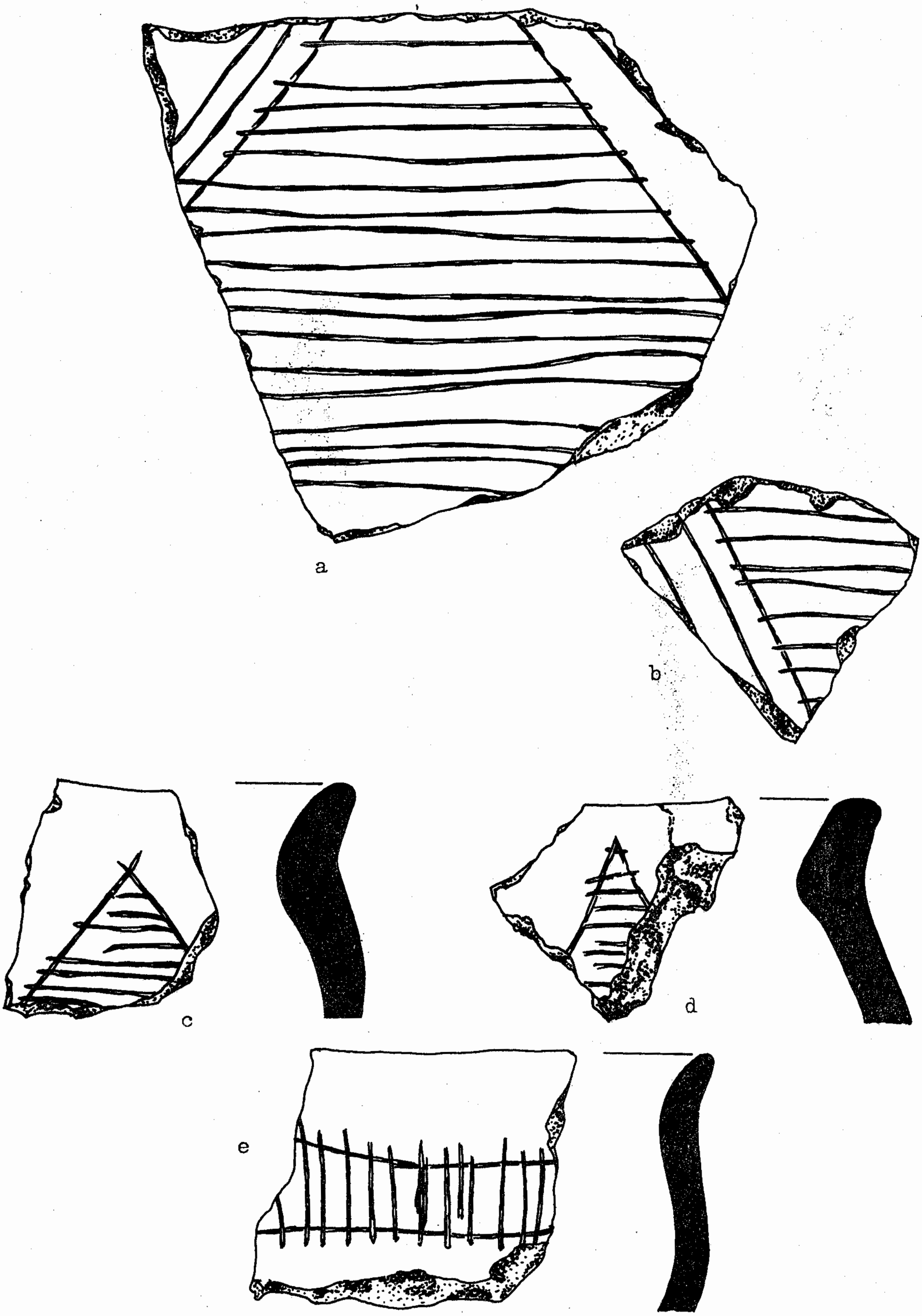

Fig. 10c Pottery from Kandaga A9, Trench II layers 2-4. (Natural size).

had been broken but the bowls seem to have had everted lips. In the case of the jar, decoration consisted of irregular and widely spaced shallow parallel incisions (Fig.10a:a-d). The decorations on the bowl sherds (Fig. 10a:a-c) ranged from chevron or zigzag motifs, squares made by incisions to wide v-shaped parallel bands.

Layer 2a. The majority of the potsherds in trench I were found in layer 2, but only five were rim, the rest being body sherds, and hence difficult to identify. Four of the five rim sherds were decorated, but only two are illustrated (Fig.10a:e-f) and belong to bowls. The bowl rims are generally thick, more or less straight with a slightly everted rounded lip. The decorations seem to fall into four categories, viz. a) zigzag or chevron motifs of incised lines along the rim, b) deep incised lines or grooves mostly in parallel bands but sometimes also with vertical lines just below the rim, c) cord impressed horizontal lines, d) stamped motifs using a comb-like instrument. The jar sherd (Fig.10b:g) was plain.

Layer 2b. All of the identified seven rim sherds belonged to bowls (Fig. 10b:a-g). Altogether four bowls are represented. One seems to have had an everted rim and an out-turned lip, two were a straight rimmed flat lipped bowls and the fourth was a plain bowl.

Trench II - Layer 2. Two rim sherds, one plain and the other decorated all belonging to globular jars were identified. One of the jars (Fig.10c:a) had an everted rim with a rounded lip and incised line decoration.

Layer 3. Four rim sherds, one once a part of a jar and the others bowls, were among the sherds found. The three bowl sherds had everted rims with tapering rounded lips. Decorative motifs fall into: a) incising with horizontal lines in triangular motifs alternating with horizontal and slanting lines; b) horizontal incising alone; c) a combination of horizontal and vertical just below the rim; or, d) cord impression and comb stamping. Only one of these (Fig.10c:b) is illustrated.

Layer 4. Four rim sherds representing three jars and one bowl were found. Of the jars, two were relatively thin and had everted rims (Fig.10c:c,e), while the third was not only thicker but had a sharply inflexed out-turned rim, suggesting that the vessel was used for a function different from that of the thin walled ware (Fig.10c:d). The bowl sherd was simply straight with a slightly inturned lip. Decorations were like those from Layer 3.

Trench III Surface: A few body sherds decorated by a combination of horizontal and vertical incisions and cord impression, and evidently of recent origin, were found.

Layer 2. Two rim sherds, one sharply inflexed and the other with an everted rounded lip, were found. Both seem to have belonged to a jar. Decoration starts immediately below the rim and consists of either punctation, presumably executed by a spatula or a straw, thus producing minute triangular and semi-circular motifs, or horizontal incising. Punctation was done horizontally and vertically on the same vessel.

Overall, there were many more sherds representing bowls than jars, but due to the small sample size, this cannot be taken as an indication of preference of one type of vessel over another for activity patterning. The decorative motifs, especially cord impressed, punctation, and incising of horizontal and vertical lines, are still practiced by the local potters (Liesegang: in press), and the cord impression resembles that reported from Iramba (Odner 1971). There are no types comparable to early Iron Age pottery such as Dimple-base, Kwale, Kansyore and Lelesu ware, although the latter has been collected in the adjacent country of Usandawe. In general, the tempering is fine, consisting of small grains of quartz, sand and grog. The finish was generally smooth, especially on the inside, but in many pieces it was equally smooth on either side. As might be expected, the sherds had different colours depending on the composition of the clay, atmospheric temperature and duration of firing (Shepard 1968), and I might add, post-firing uses.

Thus vessels which were used for cooking will be black while those used for storing foodstuffs will more or less retain their after-firing colours. Liesegang (pers. comm.) believes that the Kandaga pottery resembles that of the Iron Age site of Engaruka, but this is something that needs more research such as study and analysis of rim profile variables, shape, size functional analysis, and temper consistency analysis.

Beads: Only four ostrich egg-shell beads (average diameter 5mm.) were found. More were found in the other two sites studied for this dissertation.

Fauna: 2.381 gm. of bone were recovered during the excavation. Most of these were post cranial parts, especially splintered limb bones, but there was also a sizeable amount of dental remains. The latter are reported here as the rest have not been identified.[14]

Trench I Layer 2:

a. 35 fragments of teeth of medium and large-sized bovids.

b. 1 worn equid tooth from the lower jaw, possibly zebra (*Equus* sp.).

c. 1 equid tooth from lower jaw, possibly young zebra (*Equus* sp.).

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[14] I am indebted to Dr. Richard M. Gramly of Peabody Museum, Harvard University, for identifying the animal teeth.

d. 2 fragmentary molar "buds" of large-sized bovids.

e. fragmentary upper molar of hartebeest (Acelaphus sp. or Damaliscus sp.).

f. Well-worn right upper M^3 of hartebeest.

g. horn core; probably reedbuck (Redunca sp.).

Minimum 5 animals represented

Layer 3.

a. 6+ unidentifiable tooth fragments.

b. 4 tooth fragments of medium or large-sized bovids.

c. upper M^2 of oryx (Oryx beisa perhaps).

d. lower right M_2 of roan antelope (Hippotragus equinus). or of oryx (Oryx beisa, perhaps); a definite attribution is difficult.

e. molar "bud" of medium or larged-sized bovid

f. Extremely fragmentary equid tooth, perhaps zebra. (Equus sp.)

g. Well-worn heavily calcretized molar of medium or large-sized bovid.

h. lower right M_3 of reedbuck (Redunca sp.)

i. 3 tooth fragments of small or medium-sized bovid.

j. extremely worn upper P^1 of medium or large-sized bovid

k. right upper M^2 of bushbuck (Tragelaphus scriptus)

l. microfauna: dental arcade and incisor of rat comparable in size (but not identified as) to Otomys sp. (swamp rat, Tanzania).

Minimum 6 animals represented

Trench II Layer 2

a. medial incisor of *Bos* sp.

b. Upper left M^1 or M^2 of *Bos* sp.

c. Unidentifiable molar fragment of bovid.

d. Lower P_2 or P_3 perhaps of *Bos* sp.

Minimum 1 animal represented

Layer 3.

a. right upper molar M^2 of hartesbeest (*Alcelaphus* sp. or *Damaliscus* sp.).

b. 2 incisors with average wear and one heavily worn central incisor of hartebeest.

c. 2 fragments of incisors of medium-sized bovid.

d. 1 incisor "bud" of medium-sized bovid fragmentary upper and lower molars, probably of hartebeest.

e. lower left M_2 and M_3 of bushbuck (*Tragelaphus scriptus*).

f. lower right M_3, possibly of Grant's gazelle (*Gazella grantii*).

g. left and right upper P^3 of Grant's gazelle (*Gazella grantii*)

h. extremely worn upper molar of bovid, species uncertain.

i. bovid upper P^1, species uncertain.

j. 2 upper premolar fragments of medium-sized bovid

k. 3 tooth fragments, perhaps bovid teeth.

l. rodent mandible: perhaps ground squirrel (sp.?)

Minimum 6 animals represented

Layer 5.

a. bovid tooth fragment.

b. incisor "bud" of bovid of medium size.

c. jaw fragment of unidentified species of rodent.

Minimum 3 animals represented

Trench III Level 2

a. upper right P^2 or P^3 of *Bos* sp.

b. 5 unidentifiable bovid tooth fragments.

c. tooth of hyrax (probably *Heterohyrax* sp.).

Minimum 2 animals represented

The significance of the faunal data presented above is rather difficult to assess without the analysis of the complete faunal data, especially when it is realized that animal jaws do not contain much meat on them and hence would be brought to camp less frequently than other parts of the body. However, on the basis of the teeth alone it is apparent that bovids, equids, antelopes and gazelles were the most important in the meat diets of the occupants of the upper strata at Kandaga. None of these species are found in any great numbers around Kandaga today, but as was pointed out earlier in Chapter I, the carrying capacities of many environments in central Tanzania have been drastically reduced through man's interference with the landscape. Most of the animals represented are plains herd game, but it is evident that other animals not represented by the teeth were also brought to camp. It is not implied that there is a higher incidence of teeth than other skeletal remains but only the teeth have so far been identified. Of special interest are small animals such as mole rats and hyraxes which were probably sought for food then as they are today. The occupants of trench II layer 2 which is mostly Iron Age seem to have eaten some cow meat too. This would be expected especially in the light of the C-14 dates of less than 200 years B.P. In fact, cattle along with goats and sheep were brought to East Africa from Ethiopia about 3,000 years ago (Sutton 1968:73). However, this does not suggest that the Iron Age occupants of Layer 2 were pastoralists. The most likely explanation seems to be that these people, though basically hunter-gatherers, had come into contact with the nomadic and semi-nomadic pastoralists responsible for the Stone Bowl cultures found north of the area (central Tanzania) (see also Cohen 1970); and they may have obtained the meat from the latter. The grinding stone from hearth no. 1 indicates that they may also have prepared their own grain.

In summary, we may note that in spite of the ideal size of Kandaga rock shelter and its ideal location, especially with respect to availability of water, the quantities of archaeological and faunal Late Stone Age - Iron Age material are low. It is more than likely the site was occupied for a long period as suggested by the great depth of deposits, but at short intermittent periods, thus accounting for hiatuses and the low recovery of artifacts. The finds from Trench I also suggest that the densest occupation was in the central area near the location of

Table 1: A summary of the lithic and non-lithic finds in Trench I, Kandaga A9.

LITHIC	OCCURRENCES 1	2	3	4	TOTAL	PERCENTAGE
Tools*	-	7	188	291	486	23.85
Cores	-	6	157	63	226	11.09
Flakes	-	13	627	195	835	40.97
Debris	-	17	304	170	491	24.09
TOTAL	0	43	1276	719	2038	100.00
NON LITHIC						
Ostrich egg shell bead	0	0	3	-	3	
Pottery and tuyere	5 (30gm)	3 (18gm)	75 (843gm)	-	83 (891gm)	
Bone and shell by weight	22gm	20gm	1826gm	120gm	1925gm	
Slag by weight	102gm	85gm	42gm	-	229gm	
Ochre	-	-	6 (128gm)	-	6 (12gm)	

* The category "tools" included both shaped as well as trimmed waste and utilized flakes, in the above as well as subsequent tables.

Table 2: A summary of the lithic and non-lithic finds in Trench II, Kandaga A9.

	LAYERS (OCCURRENCES)*									
LITHIC	1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16	17-18	TOTAL	PERCENTAGE
Tools	1	7	18	28	61	94	62	44	7	322	1.49
Cores	1	28	18	319	680	246	49	36	24	1401	6.48
Flakes	2	34	9	748	1055	150	26	55	33	2112	9.76
Debris	17	283	72	3023	8364	2866	1109	1497	564	17795	82.27
TOTAL	21	352	117	4118	10160	3356	1246	1632	628	21630	100/00
NON-LITHIC											
Ostrich egg shell bead	-	1	-	-	-	-	-	-	-	1	-
Pottery	18	291	94	-	-	-	-	-	-	403	-
Bone and Shell	49gm	231gm	40gm							320gm	-
Slag	-	753gm	120gm	-	-	-	-	-	-	873gm	-
Ochre	-	-	-	-	-	-	-	-	-	-	-

* 11 - 18 are arbitrary levels of 30 cm. each. Altogether 17 archaeological occurrences were recognized.

Table 3: Summary of the lithic and associated finds in Trench III, Kandaga A9.

LITHIC	LEVELS (Occurrences) 1-5	6-10	11-15	16-20	21-25	26-30	30-33	TOTAL	PERCENTAGE
Tools	155	165	83	81	64	107	39	694	2.06
Cores	243	596	388	569	265	260	609	2930	8.72
Flakes	483	506	288	531	203	278	403	2692	8.01
Debris	3956	3839	4128	5770	2138	2347	5122	27300	81.21
TOTAL	4837	5106	4887	6951	2670	2992	6173	33616	100.00
NON-LITHIC									
Pottery	33	-	-	-	-	-	-	33	
Metal	1	-	-	-	-	-	-	1	
Ochre	7	-	-	3	14	-	-	24	
Bone by weight	101gm			1gm		16gm	18gm	136	

Table 4: Summary of the Lithic Finds at Kandaga A9

Categories	Trench I	Trench II	Trench III	Total	%
Tools*	486	333	694	1513	2.64
Cores	226	1401	2930	4557	7.95
Flakes	835	2112	2692	5639	9.84
Debris	491	17795	27300	45586	79.56
TOTAL	2038	21641	33616	57295	99.99

* The tool category includes both shaped tools and backed/trimmed wastes and utilized flakes.

Table 5: Stratigraphical distribution of tools (shaped and unshaped) in Trench I, Kandaga A9.

Tool Categories	LAYERS (OCCURRENCES) 1(2)	2(3)	3(4)*	Total	Percentage
Crescents	1	17	28	46	9.31
Triangles	-	4	10	14	2.83
Trapezes	-	1	5	6	1.21
Backed flks/blds	-	21	30	51	10.32
Casually wrkd flks	-	9	19	28	5.67
Truncated flakes	-	7	8	15	3.04
Borers/becs	-	6	11	17	3.44
Fabricators	-	-	-	-	-
Outils écaillés		2	3	5	1.01
Burins	-	-	3	3	0.61
Denticulates	-	-	-	-	-
End scrapers	1	7	12	20	4.05
Side scrapers	3	18	29	50	10.12
Core scrapers	-	2	2	4	0.81
Convex scrapers	-	-	-	-	-
Nosed scrapers	-	-	-	-	-
Irregular scrapers	-	-	-	-	-
Trimmed waste	-	3	6	9	1.82
Utilized flakes	2	87	124	213	43.12
Beads	-	3	-	3	0.61
Awls	-	-	-	-	-
Hammerstone/anvil/ grindstone	-	2	3	5	1.01
Others	1	2	2	5	1.01
TOTAL	8	191	295	494	99.99

* Figures in brackets indicate archaeological occurrences corresponding to the layers.

Table 6: Stratigraphical distribution of tools (shaped and unshaped) in Trench II Kandaga A9.

Tool Categories	LAYERS (OCCURRENCES) 1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16	17-18	Total	Percentage
Crescents	-	-	-	-	-	-	-	-	-	-	-
Triangles	-	-	-	-	-	-	-	-	-	-	-
Trapezes	-	-	-	-	-	-	-	-	-	-	-
Backed flks/blds	-	1	2	6	9	7	3	3	-	31	9.31
Casually worked flks	-	1	1	4	10	5	4	5	-	30	9.01
Truncated flakes	-	-	-	1	2	3	1	-	-	7	2.10
Borers/becs	-	1	-	2	3	5	2	1	-	14	4.20
Fabricators	-	-	-	-	-	1	1	-	-	2	0.60
Outils écaillés	-	-	4	3	7	10	6	4	-	34	10.21
Burins	-	-	-	-	1	2	-	-	-	3	0.90
Denticulates	-	-	-	-	-	-	-	-	-	-	-
End scrapers	-	-	1	1	4	6	3	3	-	18	5.41
Side scrapers	-	1	1	1	9	15	10	3	-	40	12.01
Core scrapers	-	-	3	2	4	9	5	6	-	29	8.71
Convex scrapers	-	-	-	1	-	3	2	1	-	7	2.10
Nosed scrapers	-	-	-	-	-	-	-	-	-	-	-
Irregular scrapers	-	-	-	-	-	-	-	-	-	-	-
Trimmed waste	1	2	4	3	6	8	7	2	4	37	11.11
Utilized flakes	-	-	2	4	6	20	18	16	3	69	20.72
Beads	-	1	-	-	-	-	-	-	-	1	.30
Awls	-	-	-	-	-	-	-	-	-	-	-
Hammerstone/anvil/ grindstone and others		1						4	6	11	3.30
TOTAL	1	8	18	28	61	94	62	48	13	333	99.99

Table 7: Stratigraphical distribution of tools (shaped and unshaped) in Trench III Kandaga A9.

Tool Categories	LEVELS (OCCURRENCES) 1-5	6-10	11-15	16-20	21-25	26-30	31-33	Total	Percentage
Crescents	2	3	1	-	-	-	2	8	1.15
Triangles	4	4	2	-	2	3	1	16	2.31
Trapezes	-	2	-	1	-	-	-	3	0.43
Backed flks/blds	24	13	12	17	6	7	2	81	11.67
Casually worked flakes	16	11	7	6	5	6	3	54	7.78
Truncated flakes	1	3	1	2	3	-	-	10	1.44
Borers/becs	-	3	7	-		4	3	18	2.59
Fabricators	3	-	1	-	-	-	-	4	0.58
Outils écaillés	9	20	4	10	9	14	-	66	9.51
Burins	1	1	-	-	-	-	-	2	0.29
Denticulates	-	-	-	-	-	-	-	-	-
End scrapers	12	10	5	6	3	2	2	40	5.76
Side scrapers	26	17	10	4	3	7	7	74	10.66
Core scrapers	3	5	2	4	2	8	-	24	3.46
Convex scrapers	2	-	-	3	1	-	1	7	1.01
Nosed scrapers	-	1	-	-	1	-	-	2	0.29
Irregular scrapers	11	15	4	6	6	8	3	53	7.64
Trimmed waste	8	10	6	3	5	3	1	36	5.19
Utilized flakes	30	38	16	19	15	44	14	176	25.36
Hammerstone/ anvil and others	3	9	5	-	2		1	-	2.88
TOTAL	155	165	83	81	64	107	39	694	100.00

Table 8: Summary of the lithic tool frequencies from Trenches I, II and III, Kandaga A9

	Trenches				
	I	II	III	Total	Percent
Crescents	46	-	8	54	3.57
Triangles	14	-	16	30	1.98
Trapezes	6	-	3	9	0.60
Backed flakes/blades	51	31	81	163	10.78
Casually worked flakes/blades	28	30	54	112	7.41
Truncated flakes	15	7	10	32	2.12
Borers	4	8	8	20	1.32
Becs	13	6	10	29	1.92
Fabricators	-	2	4	6	0.40
Burins	3	3	2	8	0.53
Outils écaillés	5	34	66	105	6.94
End scrapers	20	18	40	78	5.16
Side scrapers	50	40	74	164	10.85
Core scrapers	4	29	24	57	3.77
Convex scrapers	-	7	7	14	0.93
Nosed scrapers	-	-	2	2	0.13
Irregular scrapers	-	-	53	53	3.51
Trimmed waste	9	37	36	82	5.42
Utilized flakes	213	69	176	458	30.29
Others	5	11	20	36	2.38
TOTAL	486	332	694	1512	100.01

the robber's pit. The site was occupied at first by a people practicing Stone Age technology. Later on these people came into contact with Iron Age cultures, but they still continued making stone tools, while at the same time they incorporated Iron Age artifacts in their technology. Replacement of the Late Stone Age by Iron Age at Kandaga A9 seems to have been a very gradual process. There are several sites in Africa where the two coexisted at least for sometime before the Iron Age took over. The author was told by the Wanyisanzu people that they still use sharp flakes of obsidian and clear quartz to make body incisions in preference to steel razor blades.

A remote speculation for the great depth of the deposits in trench II is to attribute the few recovered angular waste to termites. Termite runs were seen in the lower layers and since there are some ant hills around the site, it is conceivable there was a termite hill at the site at a time between the Late Stone Age - Iron Age occupations and that some lithics may have rolled down the runs made by the termites, hence the low density and sporadic distribution of artifacts in the lower layers. This is, however, considered unlikely because not only does the stratigraphy negate it, but as already mentioned at the nearby site of Kisese, the deposits were just as deep though artifacts occurred in higher densities.

Majilili 2B (ca. 4° 44'S, 35° 52' E)

The site called Majilili 2B (Fig. 11) is in one of the three granitic rock shelters on the western slopes of Muhenya hill, part

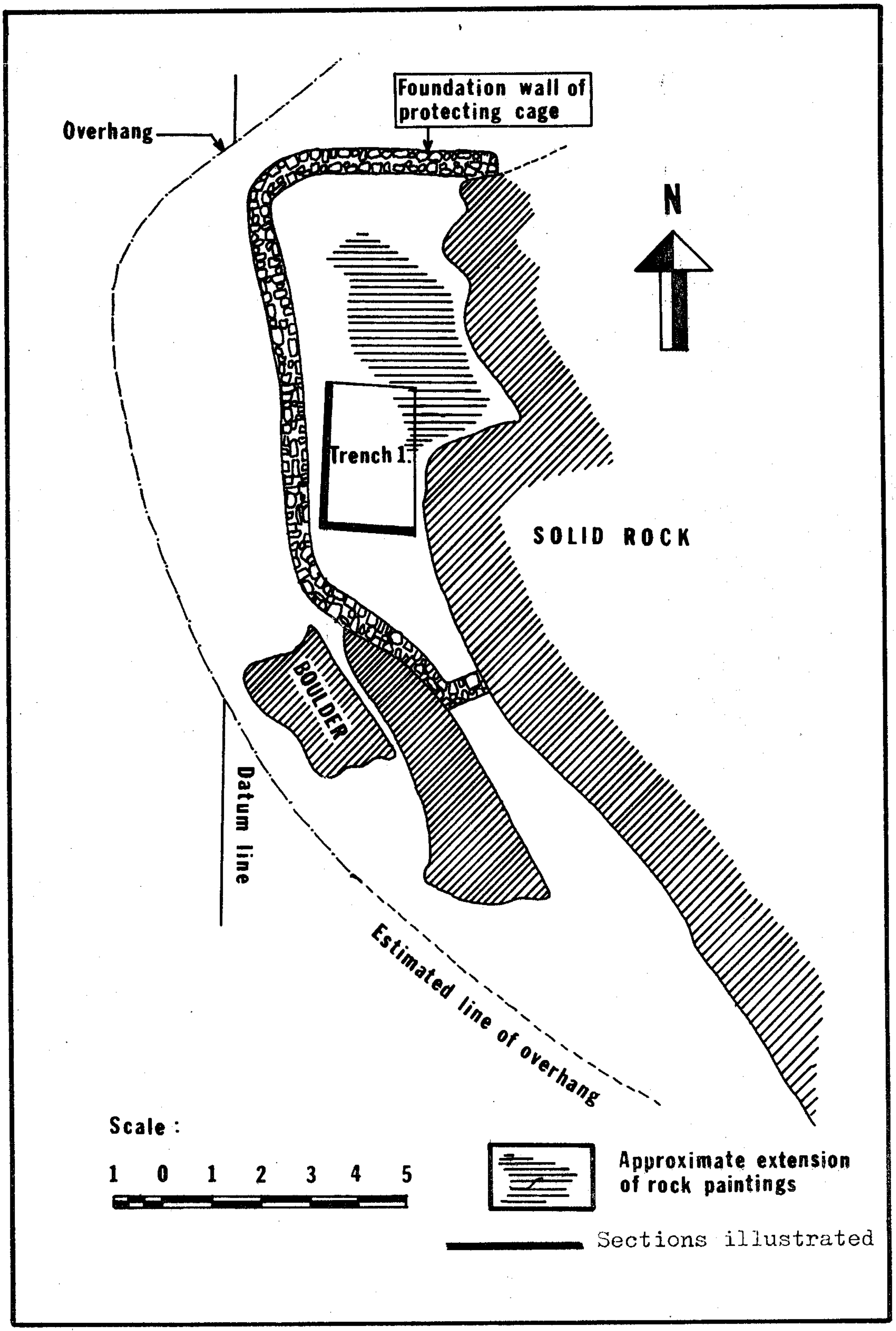

Fig. 11 Plan of Majilil 2B Rock Shelter.

of the Masai escarpment in Kondoa district, and overlooking Hembe korongo. Like the other two nearby rock shelters (Mungumi wa Kolo and Majilili 2A), it has a huge overhang formed by an upper portion of the rock shelter which juts out and thus provides protection from wind, sun, rain and cascading rain water. The rock shelter is approximately 20 m. long at the base and 25 m. high, and roughly semicircular in plan view. The overhang juts out for a distance ranging from 7.0 m. to 5.0 m. from the base of the shelter (Fig. 11). North of Majilili 2B, is the bigger and more impressive rock shelter site of Mungumi wa Kolo, located at the top of the 1667 m. high Muhenya hill. The third rock shelter is smaller and at a lower elevation. Discounting the steep elevation, the three shelters, all of which have paintings, are about 200 m. from each other.

To the north and northeast, Muhenya hill abruptly slopes to the wide sand wash of Nchulunchulu, the plains of Lusanga and the village of Pahi. To the west and about 3 km. away from the site of Majilili 2B, is the village of Kolo, while that of Choka can barely be seen at a distance to the southwest. The terrain is rather rugged and rocky, being studded with granite outcrops in addition to having a rather steep slope. The present vegetation is composed of bushes and scattered woodland trees, with patches of grass on the slopes, while at the valley bottoms, are larger trees. At present, there are not many animals in the area, but the eland, lesser kudu, dikdik, wild pigs, hyenas and even leopards have been reported. The immediate area around the site is uninhabited save for occasional visits of herdsmen with their flocks of sheep and cattle. It is well drained and rather dry but 200 m. down the slope from the site is a small spring which always runs with water even during the dry seasons.

The site can be reached by car from Kolo (24 km. north of Kondoa on the Great North Road), but it is advisable to use a four wheel driven vehicle, by heading towards Muhenya and taking the first right turn off just after the shoulder of the escarpment. A few meters ahead is the rock bedded korongo of Hembe which after crossing, one simply heads on until the car park clearing prepared by the Department of Antiquities is reached. The site should be up the slope slightly to the left and about 200 m. from the car park.

The site of Majilili 2B has paintings executed in two distinct red pigments; brick red and maroon, employing conventionalized and naturalistic styles (Fig. 68). The subject matter depicted is either human figures or animals. The animals are, as a rule, naturalistic silhouettes or decorated with line shading, while the human figures are stylized. The latter are depicted engaged in some activities, sometimes with a loin cloth or a headdress. A detailed description of the rock art will be found in Chapter 5.

The Excavation

A 3 x 2 m. trench was dug 6.34 m. north, northeast of the datum which was established outside the shelter. Digging was conducted in natural levels and altogether twelve strata were recognized on the southeast-southwest profile, (Fig. 12a,b), but only 9 archaeological occurrences were recognized. The top layer almost uniformly 35 cm. thick, was composed of loose soft white sand. Concentration of artifacts, especially chunky large polyhedrons (greater than 10 cm. at the widest points), was highest in this layer. Only a few of these larger polyhedrons were saved, while the rest were left at the site after having been counted and measurements taken. A flat slab of rock with a depression at the centre was found at the southwest corner of the trench. Stratum 1 corresponds to occurrence 1.

The texture and composition of stratum 2 was more or less like the first but it was brown in colour and generally moist. Occurrence 2 showed apparent reduction of artifacts, but chunky cobbles increased. It was 30 cm. thick and overlies a layer of silty sand, stratum 3,intercalated with a lens of decomposed granitoid gneiss. This was designated as occurrence 3. At a depth of 90 cm. from the top of the trench, a drastic change of soil colour taken as the marker of stratum 4 was observed. Stratum 4 was only 15 cm. thick and corresponds to occurrence 4. It overlies a substratum of more compacted and decomposed rocks forming layer 5. The colour varied from ashy grey to dark brown depending on the type of decomposed rocks. Artifacts in occurrence 5 were generally rare, but towards the southern half of the trench a few polyhedrons were found. The contact with stratum 6 was unmistakenly sharp. The latter was full of water-worn pebbles cemented together with a silty matrix. Artifacts were very rare but cobbles continued to appear. They belong to occurrence 6.

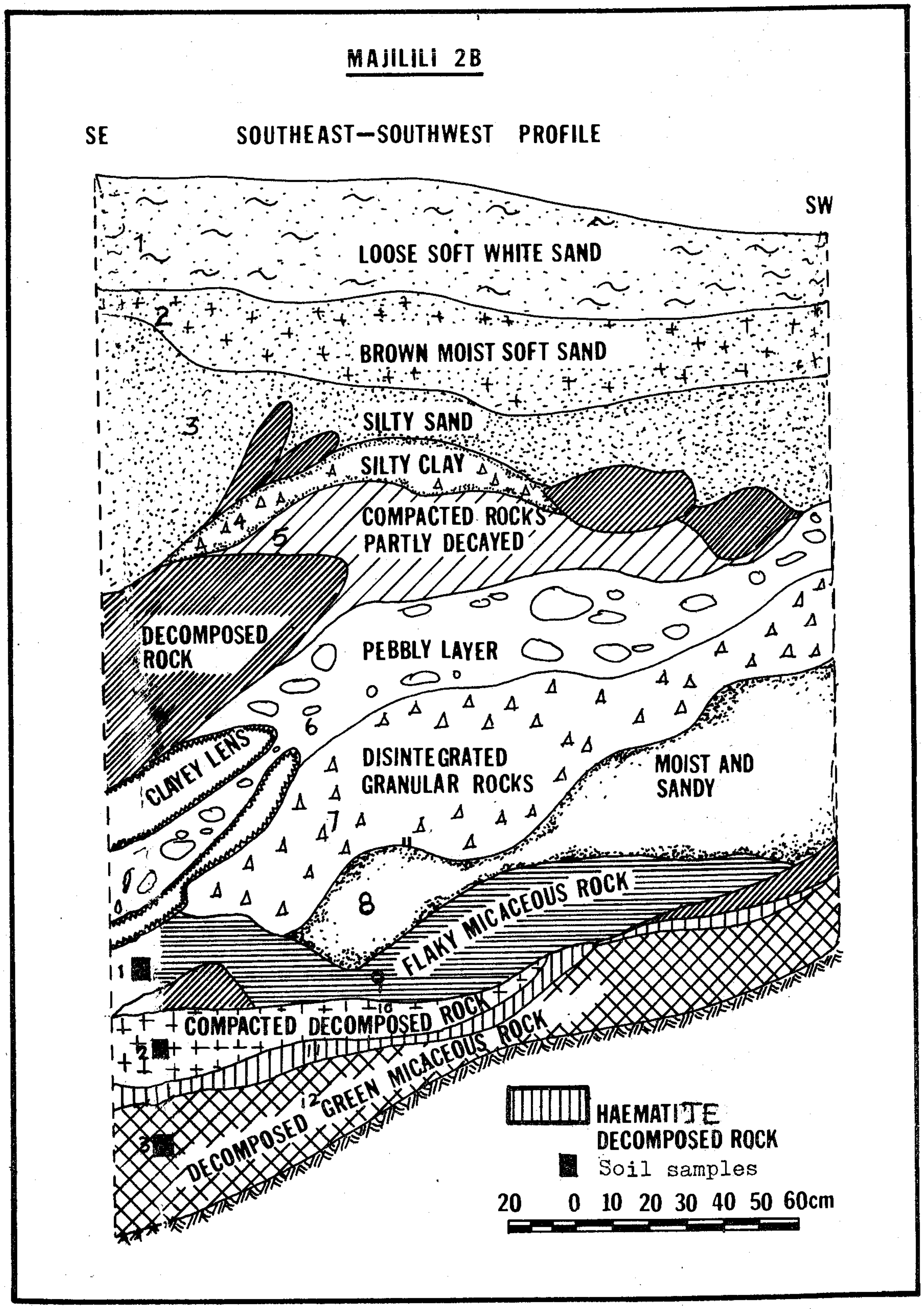

Fig. 12a Majilili 2B. Profile of the south east - south west wall.

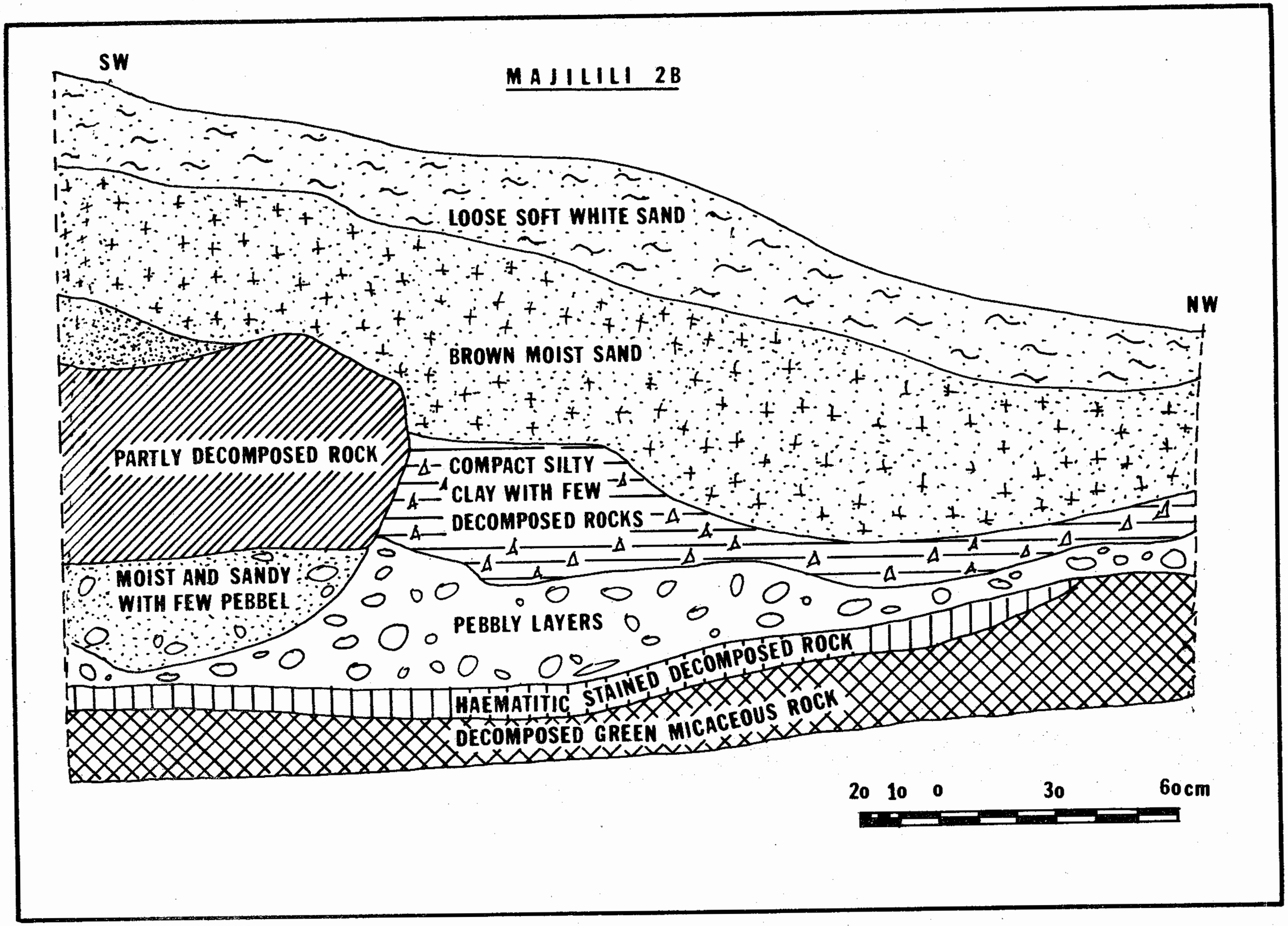

Fig. 12b Majilili 2B. Profile of the southwest - north west wall.

The next three layers, (7,8,9) and corresponding to occurrences 7,8,9, yielded very few artifacts. The first was predominantly composed of disintegrated granular granitic rocks. At a depth of 1.20 m. it was succeeded by a rather moist sandy layer mottled with small lenses of decomposed rock and overlying a third layer which had extensive soft and flaky green micaceous rocks to a depth of 1.40 m.

The last three layers were completely sterile. First, compaction within the decomposed granular granitic rocks was found to have tremendously increased and the colour of the flaky micaceous rocks changed into black instead of green. This remained consistent for about 8.0 cm. before changing into haematite stained decomposing rock. The latter was hard and well cemented in some area, but otherwise fairly soft to dig into. This was finally underlaid by a thin but consistent lens of decayed green micaceous rocks. At the top it was soft, but as contact with bedrock was approached it became harder and slightly brown.

The stratigraphy and the cultural deposits recovered from Majilili 2B pose a number of questions. We would like to know, for instance:

1. The source and mode of deposition of the two first layers of pure sand.
2. The significance of the layer of pebbles firmly cemented together.
3. The chemical processes responsible for the disintegration of the bedrock as reported here.
4. The explanation for the almost absence of artifacts

after layer 4, the proliferation of polyhedrons and cobbles and, the total absence of faunal remains.

The answers to these are not readily obvious. Let us first briefly look at cave environments. Butzer (1971) distinguishes two major types of caves; exterior caves and niches and interior passages and caverns. The latter are mainly the result of karst activity and are found in limestone country such as South Africa; for example, the famous sites of Swartkrans, Sterkfontein, Cave of Hearths and, the Hyaena Cave at Makapansgat (Brain 1967:285-300), and as such do not concern us here. The other type may vary from simple overhangs and shelters, e.g. the two sites of Kandaga A9 and Majilili 2B, to shallow open caves, e.g. Kwa Mwango and Kirumi, all of which are discussed in this chapter. For these, rain, water, insolation, and wind are probably the most important weathering agents. Soil development is generally rather slow, but soil products can be washed from outside through large joints. The deposits of most caves are predominantly soft, moist, plastic earths mainly of silt or clay size, but coarse inclusions may also be found (Butzer 1971:210). Various specialized sedimentological techniques have been developed (Butzer 1971, Brain 1958, 1967) in order to determine the importance of mechanical weathering in studying cave deposits, but such exercises are outside the scope of this dissertation. It suffices to take cognizance of the fact that wind, water and temperature amplitudes on the chief agents of weathering in the caves and shelters of Central Tanzania.

In the case of Majilili 2B site, the first three layers of sand probably represent extraneous mineral sediments introduced from outside by wind and water while the lower sediments represent detritus falling from the ceiling and wall, mainly through thermoclastic fracturing and residual products brought in by water. The size, wearing and imbrication of the firmly cemented pebbles suggest deposition by water. Perhaps there was once a channel running from the northeast part of the shelter before the site was intensively occupied. The direction of the current would conform to the natural slope of the shelter floor. Percolating water containing atmospheric CO_2 or carbonic acid in solution probably accounts for the thin attenuated micaceous slivers covering the bedrock. The disintegrated granular weathered granite already referred to and found interbedding the lower strata at Majilili 2B site is known as grus (Gruss) (Twindale 1971:23-24) and may have resulted from partially chemically weathered granite.

Three soil samples (samples Nos. 1,2 & 3) were taken respectively from layers 9, 10 and 12 and analyzed at the laboratory of the Mineral Resources Division, Dodoma. The results of the analysis show that most of the soil was probably formed from detritus falling from the parent rock of the shelter as indicated by the preponderance in composition of the oxides of silica, aluminium, and iron all of which are also found in very high concentration in the granitic rocks of Kondoa (Table 9).

There was hardly any organic matter preserved at Majilili 2B. At first it was thought perhaps the soil was too acidic for organic matter to preserve, but the pH values fall within the suitable range for organic preservation. The absence of organic matter can therefore be taken perhaps as an indication of activity preference or selection. The site was perhaps a factory site occupied for only a few hours a day or a week and as such no food refuse was left there.

The Assemblage: Tables 10 and 11 summarize the assemblage at Majilili 2B. Angular waste, other than flakes and trimmed nondescript debitage, accounts for 68.02% of all the assemblage while tools account for only 3.74%. The latter compares favourably with a 3.5% for tools at Lululampembele (Odner 1971), 3.8% at Nsongezi, 4.5% at Nyabusora (Nelson 1973), and 2.6% at Kandaga A9. On the basis of this alone, the assemblage is within the range of what might be expected. However, the assemblage may be considered generally poor in shaped tool types other than scrapers which altogether account for 29.94% of all the shaped tools. In comparison, the scraper category makes up 22.5% of the tools at Lululampembele, 17.4% (averaged percentage) at Seronera (Bower 1973:102), 17.8% at Nyabusora and 41.7% at Nsongezi (Nelson and Posnansky 1970:170). In short therefore, the relative proportion of the scrapers at Majilili 2B is within the range of similar sites in East Africa. The proportion of crescents at Majilili 2B is not only relatively low, but all the crescents are very crudely made with a minimum of modification for the backing. Outils écaillés, account for 9.58% of the tools and although this is rather low, it is nevertheless within the accepted range of Late Stone Age sites hitherto published. Compared with Kandaga A9, the frequency distribution of the different tool categories at Majilili 2B is just as uneven. In both, utilized flakes score the highest frequency (28.14% at Majilili 2B, 30.29% at Kandaga A9) followed by side scrapers (15.97% Majilili 2B, 10.85% Kandaga A9).

Overall there is a substantial proportion of trimmed angular waste (12.97%)which together with flakes and cores constitute the bulk of the assemblage. Although these are not tools sensu stricto, they provide as Mason (1967) has argued, a reservoir of stone artifacts either for immediate use or for trimming into artifacts. From a technological point of view, the assemblage is less microlithic than any of the other three studied. Real microlithic tools were few, some of the lunates being rather big and as has been pointed out earlier, rather roughly backed. This point will become clear when the four assemblages are compared metrically.

It is also observed that after the first four layers which together account for 90.66% of the assemblage, artifacts other than spheroids and chunky polyhedrons become exceedingly reduced. This is rather baffling because unless the cores found all the way down to layer 8 were brought in from outside, one should find the products of which the cores are the leftovers. In Smithfield Complex from the Natal Coast, Inskeep (1967), reports that cores were present from only two of the 22 sites listed by Vanneck and Walsh (1961), whereas flaked pebbles were present at all sites (Inskeep 1967:567). One cannot but surmise whether the cores, polyhedrons and spheroids were not brought in as "manuports" from somewhere else, perhaps to be used as missiles during the time when there was not much knapping activity at the sites.

The vertical distribution of artifacts would lend support to this and it seems to me that occupation of the site started at the time of layer 4. Even then, the site was only occupied seasonally, perhaps by a few people at first, reaching a peak at the time of layer 1. The absence of faunal remains and cultural artifacts such as beads, and Iron Age material would also support the view that the site was not occupied by Iron Age people. Perhaps here is a localized typology, adapted not only to a specific cultural strategy in a particular environment, but also to raw material and/or a technological level, the latter carrying with it serious temporal connotations. The makers of the Kandaga A9 and Majilili 2B assemblages shared more or less similar environments and therefore differences in the assemblages must be explained by other factors. The raw material is exclusively quartz which unlike Kandaga A9 is easily available. The abundance of easily obtainable material made it unnecessary to reduce cores exhaustively, hence the profusion of large cores and polyhedrons. Secondly, the assemblage at Majilili 2B may be older than the other three assemblages and it may be argued that the techniques of pressure flaking and retouch were not yet under control and hence the presence of many crudely backed pieces. Although there are no C14 dates to substantiate this speculation, the Majilili 2B assemblage is perhaps closer to the scraper-rich deposits at Kisese II which are said to be transitional between Middle Stone Age and Late Stone Age (Inskeep 1962). The absence of Iron Age elements seems to support the view that the Majilili 2B assemblage is most likely older than any of the other three reported in this study, but how much older, is difficult to say. Finally Majilili 2B was perhaps a factory site, and as such the assemblage represents waste products and discarded tools while the better made tools were taken away. Inskeep (1967) and Fagan et al (1970:75) have warned that there are always unknown variables affecting proportions of stone tools so that valid comparisons between assemblages in different areas may be meaningless, but as will be apparent in Chapter 4, the assemblages studied in this thesis share several common features to make the comparison meaningful. The only other activity which the people responsible for the lithic assemblage at Majilili 2B may have indulged in was that of painting the rock shelter with silhouettes of animals and conventionalized human figures.

Table 9: Chemical composition of soil samples* from Majilili 2B,

Sample	1	2	3
SiO_2	38.80	34.99	37.49
Al_2O_3	25.70	18.67	16.64
Fe_2O_3	10.26	5.13	10.53
FeO	0.02	3.64	1.95
CaO	1.97	3.09	2.95
MgO	2.20	13.67	10.05
NaO	3.48	3.36	6.92
K_2O	1.16	5.06	0.60
TiO_2	1.38	0.88	0.73
MnO	0.05	0.02	0.07
P_2O_5	0.05	0.07	0.04
NO_3	0.28	0.23	0.23
Cl	2.40	1.59	1.56
S	0.29	0.30	0.25
H_2O-110°C	2.70	4.46	4.81
L.O.l. above 1000°C	9.80	5.44	4.63
TOTAL	100.49	100.50	99.45
pH	8.1	6.9	6.7

* Samples were taken from strata 9, 10 and 12.

Table 10 : Summary of the assemblage at Majilili 2B.

	LAYERS (OCCURRENCES)										
	1	2	3	4	5	6	7	8	9	Total	Percent
Tools	399	48	26	19	-	4	-	3	-	499	3.74
Cores	959	198	94	165	25	103	11	38	-	1593	11.88
Flakes	1046	136	53	92	26	27	4	20	-	1404	10.47
Waste	5489	816	912	1082	36	188	506	74	14	9117	68.02
Other*	70	157	215	175	145	20	-	7	-	789	5.89
TOTAL	7963	1355	1300	1533	232	342	521	142	14	13402	100.00
Percent	59.42	10.11	9.69	11.44	1.73	2.55	3.89	1.06	0.10		

* Other refers to chunky polyhedrons the predominance of the predominance of which was not encountered in other sites.

Table 11: Distribution of tools by Layers and Occurrences at Majilili 2B.

	LAYERS (OCCURRENCES)										
	1	2	3	4	5	6	7	8	9	Total	Percent
Crescents	10	-	-	1	-	-	-	-	-	11	2.20
Triangles	17	-	-	-	-	-	-	-	-	17	3.40
Trapezes	13	3	-	-	-	-	-	-	-	16	3.19
Backed flakes	8	-	1	-	-	-	-	-	-	9	1.80
Casually worked flakes	2	2	1	-	-	-	-	-	-	5	0.99
Truncated flakes	4	-	-	-	-	-	-	-	-	4	0.80
Becs	10	1	-	-	-	-	-	-	-	11	2.20
Trimmed waste	43	9	6	6	-	-	-	1	-	65	12.97
Denticulates	15	-	1	-	-	-	-	-	-	16	3.19
Burin	5	1	-	-	-	-	-	-	-	6	1.59
Utilized flakes	117	14	10	-	-	-	-	-	-	141	28.14
Outils écaillés	43	3	-	2	-	-	-	-	-	48	9.58
End scraper	18	4	2	3	-	1	-	-	-	28	5.59
Side scraper	63	8	5	3	-	1	-	-	-	80	15.97
Core scraper	24	3	-	4	-	-	-	2	-	33	6.59
Nosed scraper	3	-	-	-	-	2	-	-	-	5	0.99
Convex scraper	4	-	-	-	-	-	-	-	-	4	0.80
TOTAL	399	48	26	19	-	4	-	3	-	499	100.58
Percent	80.03	9.56	5.19	3.79		0.80		0.60			

Kwa Mwango-Isanzu (ca. 4°6'S 34°45'E)

Kwa Mwango site is in a huge dome-shaped cave which is formed by a massive rock shelter whose overhang rests on another equally large boulder (Fig. 13). At its greatest extensions, the cave is 19.90 m. x 16.80 m. but the best protected area and thus most suitable for habitation is ca. 226.5 sq. m. Hence, by using the camp base density formula for hunter/gatherer bands as suggested before in this chapter we would arrive at 23 people as being the maximum number of people who could have lived at this site at a given time; a number which approximates the "magic number 25" for hunter/gatherer bands (Lee and Devore 1968:245-248), and therefore of possible significance. The roof of the cave is 2.72 m. high at the greatest height. On the boulder which seems to support the roof and facing the southern opening of the cave, are several paintings in three shades of red. In addition, there are a few paintings in white on the ceiling, some of which are so faded out that they are referred to as 'shadow' paintings. Subject matter varies from naturalistic silhouettes and outlines of animals to stylized human figures.

The site is situated in a thick bush covered country, but scattered here and there are a few large trees. Like the Iramba plateau to the west, the Isanzu landscape is studded with many outcrops of granite or syenite, several of which have prehistoric paintings on them. It lies about 1.5 km. north of the American Lutheran Mission of Isanzu. To its

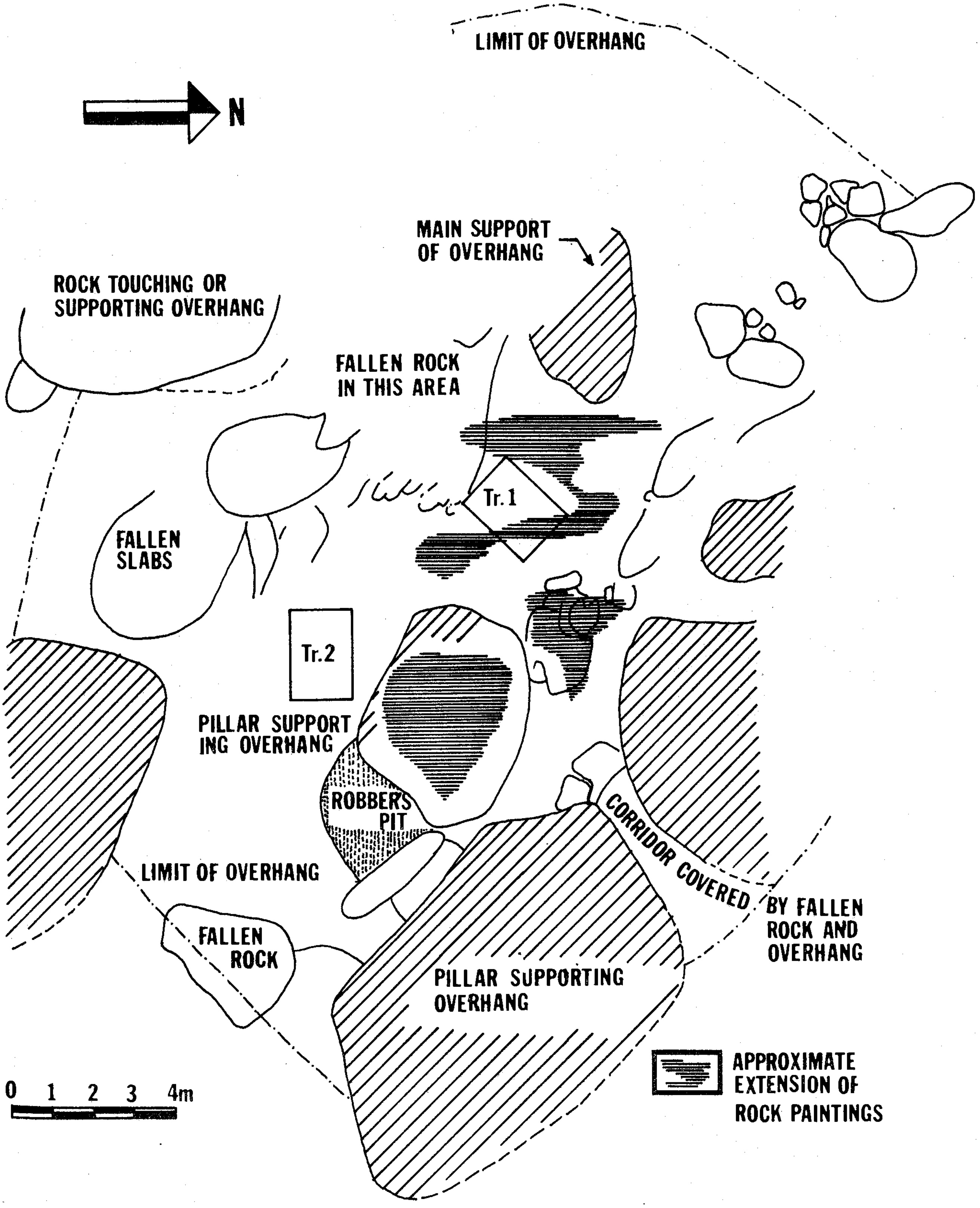

Fig. 13 Plan of Kwa Mwango Rock Shelter-cave.

northeast and about 400 m. away is the Kinyingogo rock painting site which unlike Kwa Mwango is not stratified. The local animal life includes rock hyraxes which find suitable shelter and shade among the many rock shelters and inselbergs, hyenas, leopards, baboons, monkeys, various antelopes and ungulates including the giraffe, and rodents such as hare and porcupine. Kwa Mwango cave also affords a natural habitat for bats. Most of these animals are frequently hunted by the local people, the Wanyisanzu who, although they subsist on a mixed agricultural and pastoral economy, like to supplement their meat supply with occasional hunting. The leopards, monkeys, baboons and hyenas are killed not for food but because they are a menace to cattle, sheep, and goats, and to crops. The Wanyisanzu inhabit that part of Iramba adjacent to the Haida plains, the latter of which are inhabited by the well known hunter/gathers, the Hadza. Ethnographic and linguistic evidences suggest some complex interactions between the click speaking Hadza and the nearby Bantu, the Iramba and Wanyisanzu. Consequently the Wanyisanzu use hunting techniques which are more or less similar to those used by the Hadza, employing *inter alia*, the use of poisoned arrows and similar bows and arrows.

To the south of Kwa Mwango site and 150 m. away is a small semi-permanent stream which has water most of the year, but ca. 1.5 km. further south is a bigger and more permanent stream which has some water almost all the year round. The last five years have seen an encroachment on the area around the site by local peasants who have cleared the land for cultivation. Crops include various species of millet and eleusine, maize, beans, peas, groundnuts and sweet potatoes. Many of the shelters and caves have in historical times served as hideouts during internecine warfare and raids by hostile tribes such as the Masai, as related by one old man at Isanzu. One such shelter was found to contain contemporary household paraphernalia such as cooking pots and utensils. At other times, some of the shelters and caves were used as sanctuaries for various ritualistic practices, as was the case in the adjacent Iramba country where drum caves are associated with rain making (Odner 1971:157).

Kwa Mwango was chosen for its location, being within walking distance from Isanzu, for its size, and above all for having stratified archaeological deposits in addition to the pictographs already referred to. Having surveyed the floor of the cave, two trenches were excavated one at the middle of the cave and the other slightly towards the southern entrance.

Trench I A 2 x 1.5 m. trench was dug in an area which would more or less be the centre of the cave and designated as trench I. The surface (occurrence 1), was littered with bones of small animals. possibly dropped by predatory birds and animals, lithics and a few potsherds. Excavation was conducted in levels of 10 cm. each. The deposits which were only 70 cm. deep can conveniently be divided into four stratigraphical units. (Fig. 14).

The top layer was a brown loose dusty clay which in the southwestern part of the trench was covered by a thin lens of ash. Lithics, pottery, charcoal, bone and ostrich egg-shell and shell beads were recovered. Most of the pottery was too fragmentary to be useful for studies of pottery styles. This layer was 10 cm. thick and corresponds to occurrence 2.

Stratum 2 was composed of clay mixed with loose small gravels. In the northern half of the trench the soil was brown and had a higher concentration of gravels, but was almost sterile. On the southern part of the trench however, pieces of charcoal, bone and lithics kept on occurring, but at a noticeably reduced rate. Ostrich egg-shell beads and gastropod shells were also found. Stratum 2 corresponds to occurrence 3. One of the local workers on the crew remarked that the gastropod shells may have been used as spoons on the basis of the present practices of the Wanyisanzu peoples. At the depth of about 35 cm. it became more gravelly, thus revealing the underlying layer.

Stratum 3, also treated as occurrence 4, was uniformly gravel and brown except for a small cut on the northeastern part of the trench. The latter seemed to be a fill of different texture and was dark brown in colour. Unlike the gravel in the rest of the layer, it was rich in cultural deposits. A closer examination revealed that the cut which could be traced almost to the top of the trench was a post depositional fill, and it

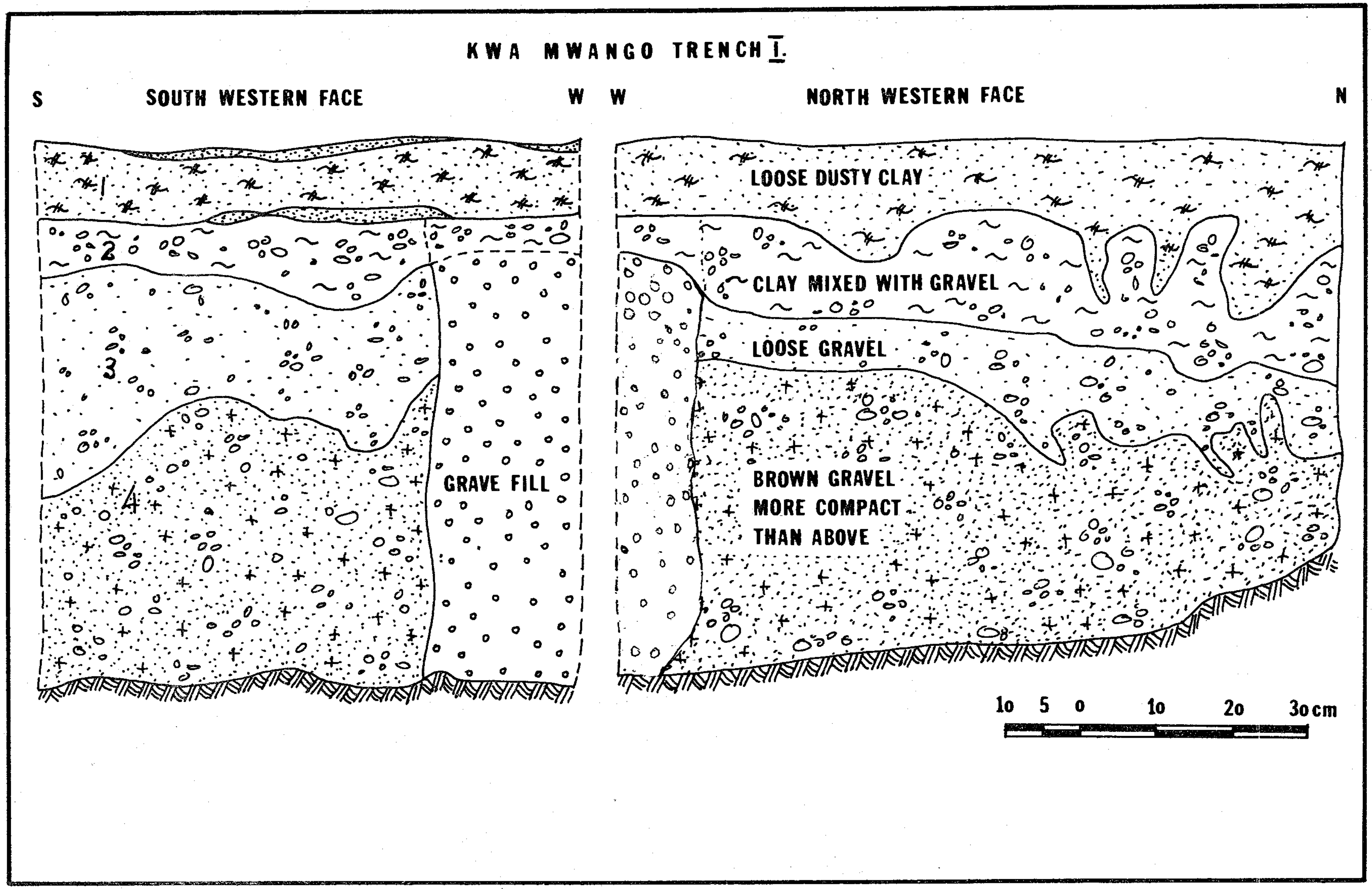

Fig. 14 Kwa Mwango Tr. I. Profiles of the south western and north western walls.

was later discovered that there was a burial in it. The burial was treated as a feature and designated as occurrence 5. Otherwise, layer 3 was sterile. Fifty centimeters from the top of the trench the compaction was noticed to have slightly changed marking the contact with the next layer.

Overlying the bedrock was a thick layer of compacted gravel which like the previous one was completely devoid of cultural deposits. It was about 40 cm. thick in the southwestern part of the trench but to the northeast it dips down and as contact with bedrock is approached, it is only 20 cm. thick. Bedrock was reached at 70 cm. in the southwest corner and at 60 cm. in the northeast corner.

It should be mentioned that the stratigraphy was not as simple as might be implied from above. Contact zones between stratigraphical units were difficult to make out at the best of times due to very little differences of compaction, texture and soil colour. The deposits are typical cave deposits and do not represent a fully developed soil.

The Burial (Fig. 15)

The burial was lying on the bottom of layer 4, about 56 cm. from the top of the trench and roughly in the southwest quarter of the trench. Since layer 4 also overlies bedrock, it means the burial was resting directly on bedrock. There were two skeletons, one of an adult female and the other of a child which had not lost its milk teeth. The adult was laid on her right side in a roughly east-west direction with head pointing due east. The child on the other hand, was laid

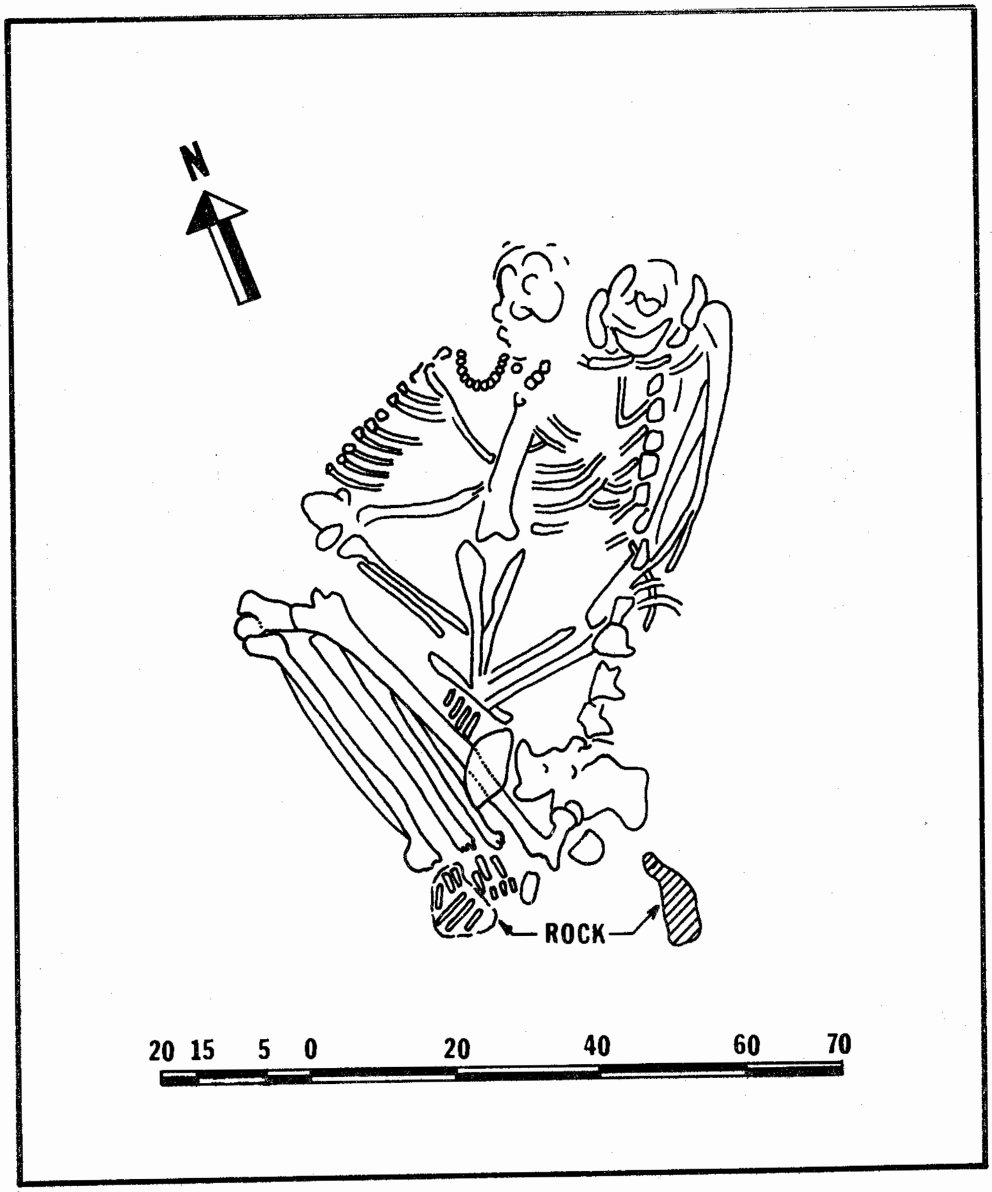

Fig. 15 Kwa Mwango Tr. I. Plan of the burial.

on its left hand side in the same orientation. Apparently, the right hand of the adult was under the child while the left hand was over the child, such that the adult embraced the child. The feet of the adult were bent so that the knees came quite close to the lower part of the chest while the heels came closer to the pelvis. Evidently, however, due to the pressure of the backfill, and as the flesh decayed away, the relative positions of the different parts of the skeleton may have been altered. It was discovered later that a local teacher had dug up another skeleton in the same site about three years ago, but inquiries as to the whereabouts of either the teacher or skeleton proved unsuccessful.

Condition

Most of the long bones were still intact and articulated, but the crania were very fragmentary. The vertebral column of the adult was almost intact but that of the child was disarticulated. The lower jaw of the child with some of the teeth was recovered intact but none of the jaws of the adult was recovered whole. Search for weapons or any pathologies were in vain. Professor David L. Greene of the Department of Anthropology at the University of Colorado kindly studied the skeletons, but he too did not find any pathological anomalies to suggest the cause of death. The skeletons also lacked any anatomical features that would suggest they belonged to people other than the Bantu inhabiting this area of central Tanzania.

Grave goods

Small twigs and badly decomposed leaves of a tree (supposedly known as "Mlama" - in Kinyisanzu language) and apparently wrapped around the corpse in the absence of an animal hide, were collected all over the skeletons. One of my informants, Mr. Omari Holela, said that in traditional Isanzu customs, people were normally buried with their feet bent, wrapped in a cow or sheep's skin, but the poor who could not afford such a shroud were buried wrapped in the leaves of the "Mlama" tree. One ostrich egg-shell bead and a cylindrical microcline feldspar bead (ethnographically about 4 generations old) were found quite close to the neck of the child. The feldspar bead still had part of the thread in it. Mr. Omari further informed me that a greenish cylindrical bead was normally worn singly around the neck by children. Several pieces of charcoal and a piece of stone under the heel of the right foot of the adult were also found. Other things found included a piece of hard ?coprolite and a small piece of earth with ochre smeared hair.

Interpretation

From the profile of the southwestern wall it appears the top layer is continuous and shows no evidence of post depositional disturbance. However a localized, thin lens of ash breaks right at the point where the top part of the burial would show, suggesting that the grave is later than the ashy lens and all the other layers beneath the ashy lens, but older than the top layer.' On the contrary, since the ashy lens is strictly local and not found on the northwestern profile, it is possible the ashy lens did not extend to where the grave was dug. However, based on the felspar bead associated with the burial and dated to about 4 generations ago (one generation is equivalent to ca. 25 years) the burial cannot be too old. In as much as the bead would suggest a post Iron Age date, it should be pointed out that the Wanyisanzu were still using ostrich egg-shell beads until recently. A piece of charcoal found together with the skeleton has given a C14 date of 3270$\pm$110 C14 years B.P. (1320$\pm$110 B.C.) (Gx-3679) while another sample from the undisturbed top layer has given a modern date of less than 200 C14 years B.P. The significance of these dates will be discussed later in this chapter. The only thing we can say about the burial is that it is about 200 years old or less.

Trench II A second 2 x 1.5 m. trench was opened on the southern side of the boulder bearing the paintings. This part of the cave was outside the central area, and although perhaps not as suitable for habitation as the central area, would nevertheless be the most ideal place to throw cultural items after they had outlived their usefulness. The surface was littered with many slabs and boulders. Digging was conducted in arbitrary levels of 10cm. each. The stratigraphy and the archaeological deposits were very much like those of trench I, except the noncultural deposits after the first three levels were much deeper, the bedrock being further down, presumably because of a southward dip. However, after a depth of 90 cm. the rest of the deposits down to 1.90 m. were completely devoid of cultural material. Only 3 archaeological occurrences were recognized. Due to the looseness of the soil and imminent dangers of a cave-in, it was decided not to draw the profile. At any rate, the profile would look like that of trench I.

Dating

As was mentioned earlier two C14 dates have been obtained for Kwa Mwango site. The first of 3270±110 C14 years B.P. (1320±11 B.C.) (Gx-3679) was from charcoal found together with the burial while the second of less than 200 C14 years (Gx3678) is also based on charcoal but obtained from the first level of 10 cm. of the top layer with Late Stone Age and Iron Age deposits. There is no doubt, the first sample, Gx3679, was part of the grave fill and would have come from layer 1 or 2 as there was no charcoal in either layer 3 or 4; the latter of which was sterile. Chances are that it came from layer 2 rather than layer 1 because as was mentioned earlier, layer 1 was deposited after the grave had been dug. On the basis of the assemblage which is comparable to that of Kandaga A9, Kirumi Isumbirira and Lululampembele, the earlier date of 3270±110 years B.P. must be accepted as representing the true antiquity of the Late Stone Age deposits at Kwa Mwango. This is also supported by other dates of 3665±140 years B.P. obtained from the nearby site of Kirumi Isumbirira, 3375±180 years B.P. for Kandaga A9 and 3830±180 B.P. by Odner (1971) at Lulullampembele. All these sites are not only similar in their cultural deposits, but share a similar physical setting, being all rock shelter cave sites with paintings. They are also in the same geographical zone. As was argued earlier in the case of Kandaga deposits, Late Stone Age technology was immediately replaced by Iron Age after introduction of the latter, rather the two seem to have coexisted in some places until late Iron Age times. The deposits in layer 1 were composed of lithics and a few sherds, thus indicating the coexistence of the two cultures. In view of this, the later date of 200 years B.P. or less obtained from layer 1 should also be accepted as indicating the upper limit of the Late Stone Age - Iron Age cultural continuum at Kwa Mwango. Similarly the burial which as has been shown preceded the deposition of layer 1 must be at least as old as the layer 1 deposits, i.e. 200 years B.P. or less.

The Assemblage

Tables 12, 13 and 14 summarize the assemblage as found in trenches I and II. A comparison of the grand totals of the two cuttings clearly suggests that the concentration of artifacts and other associated finds was considerably higher in the central area of the cave where trench I was located. A total of 4287 artifacts was collected from the surface of trench I while the surface of trench II did not have a single artifact. Perhaps this is a reflection of activity areas. While natural deposits were deeper in trench II, artifacts were restricted to the first three levels only, the rest being completely sterile. Besides lithic artifacts, the surface of trench I was also littered with bone. Much of the bone was comparatively fresh and evidently of recent origin, but there were also charred and old pieces. However, the majority were fragmentary beyond identification. Some were splintered in such a way that they retain one sharp pointed end. Two of these from occurrence 2, showed deliberate marks of utilization in the form of polishing and very fine striations under the microscope. The base of one of these was crushed in a manner suggestive of having being hammered into something. Pottery was almost absent.

Overall, the distribution of the different categories of the lithic assemblage compares well with those of Majilili 2B and Kirumi Isumbirira. Lithic tools (shaped, trimmed waste and utilized flakes) make up 5.53% of the whole lithic assemblage while various angular waste account for 71.37%. In comparison, tools at Majilili 2B account for 3.74%, 2.64% at Kandaga A9 and 4.54% Kirumi Isumbirira, while angular wastes account for 68.02%, 79.56% and 67.39% respectively. On the basis of this comparison alone, it would appear that the Kwa Mwango assemblage is most comparable to that of Kirumi Isumbirira. This is especially interesting since the two sites are not only in the same environmental setting but share a common physical setting, both being exterior cave sites. They are also closer in geographical space. The tool category also compares well with other Late Stone Age assemblages, for example a 3.5% for tools at Lululampembele, 3.8% at Nsongezi and 4.5% at Nyabusora (Odner 1971, Nelson

1973).

The percentage of 8.66% and 14.44% for cores and flakes compares favourably with percentages for similar categories at both Kandaga A9 and Kirumi Isumbirira. Those of Majilili 2B are slightly different, in that cores exceed flakes by 1.41%, a disparity possibly accounted for as already pointed out earlier, by the fact that some of the cores may have been brought into the site to be used as missiles.

A breakdown of the tool category reveals that trimmed waste (16.60%), <u>outils écaillés</u> (16.48%), scrapers (14.73%) and utilized flakes (14.43%) record the highest frequencies, while bone awls (0.42%), rubbing stones (0.48%) and fabricators (0.78%) record the lowest frequencies. The scraper category is rather low especially when compared with 22.5% at Lululampembele, 41.7% at Nsongezi (Odner 1971, Nelson 1973), 29.94% at Majilili 2B, and 24.25% at Kandaga A9, but compares favourably with 17.8% at Nyabusora and 17.4% at Seronera (Nelson 1973, Bower 1973). <u>Outils écaillés</u> (16.48%) occur at a higher percentage than either at Kandaga A9 (6.94%) or Majilili 2B (9.58%), but approximate that from the nearby site of Kirumi Isumbirira (18.82%).

Whether the observed inter-site disparities are a reflection of different activity patterning, adaptation to different

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This term is used in preference to grinding stone to avoid confusing the two. This writer maintains that the term grinding stone (upper and lower) should only be used when there is evidence that such artifacts were used for grinding grain. A rubbing stone on the other hand implies here that it was used for pounding or crushing. Other authors, use 'rubbing stone' for a grinding stone.

environments, different technological levels or caused by different sample sizes is difficult to say for certain, but a discussion is found in Chapter 4. High percentages of trimmed waste and utilized flakes are also recorded at Kandaga A9, Majilili 2B and Kirumi Isumbirira and seem to be normal for the Late Stone Age industries of East Africa. The low percentages for fabricators and rubbing stones are also normal but Kwa Mwango is the only site among the four described here where bone implements were recovered although this is by no means unusual. Bone implements have been recovered at Lulu-lampembele (Odner 1971:192), Lanet (Posnansky 1967:104), and in the "Kenya Elmenteitan" and "Kenya Upper Capsian", especially at Gambles Cave (Leakey 1936:68, Cole 1963:262).[16] The other tool categories especially the geometric microliths (crescents. backed flakes, triangles, trapezes and truncated flakes) are normal for the Late Stone Age. The 4.69% for crescents for example, compares well with 3.57% for Kandaga A9, 5.6% for Nyero rock shelter (Nelson and Posnansky 1968:165), and 2.53% for Muringa rock shelter (Sutton 1973:102), but less favourably with 15.8% for crescents and triangles at Nsongezi rock shelter (Nelson and Posnansky 1970:170).

Like the assemblages from Lululampembele and Kirumi Isumbirira, the raw material is predominantly quartz but unlike

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[16] Both the "Elmenteitan" and "Upper Kenya Capsian" industries fall within the Late Stone Age industrial complexes of East Africa. The practice of using different local names for more or less similar assemblages will be discussed later in this study.

that at Kandaga A9 and Majilili 2B, where hardly any other material was used, about 4.18% of the total assemblage at Kwa Mwango is made from quartzite. Percentages of other types of raw material as shown in Table 13 are negligible. Unlike many other Late Stone Age sites in East Africa, there was very little pottery; only 31 sherds, all of which were body sherds and therefore of little significance for reconstructing pottery types and styles were found. All surface pottery was of recent origin.

The amount of bone (1035 gm.) recovered was also small compared with the bone recovered from Kandaga A9 (2381 gm.). However, most of the stratified bone pieces were splintered in such a way that they had a sharp point at one end although they do not seem to have been used as tools. On the contrary, much more shell (ostrich egg-shell and gastropod shell) was recovered at Kwa Mwango than in any of the other three sites. Consequently, a larger number of ostrich egg-shell beads were also recovered. The few teeth retrieved have been identified as follows:

Trench I Level 1

a. incisor "bud" of medium-sized bovid

b. tooth fragment of bovid

Minimum 1 animal represented (Medium-sized bovid)

Trench II Level 1

a. 7 tooth fragments of medium or larged-sized bovid (*Bos* sp.?)

b. distal end of tibia - not identified

Minimum 1 animal represented (one medium or large-sized bovid)

In summary, Kwa Mwango was probably occupied continuously for one rather short period as suggested by the continuous but no so deep archaeological deposits (Table 14). On the contrary the shallow deposits are probably a reflection of the rate of sedimentation as well the rate of artifact disposal. It was for instance observed that there is always a strong wind current blowing through the cave and carrying off dust and sand. The occupants were basically Late Stone Age peoples, but later had some contact with or knowledge of the Iron Age. Judging by the little amount of pottery found and the lack of any other Iron Age elements, the impact of Iron Age technology on the Late Stone Age occupants at Kwa Mwango was negligible. However, as at Kandaga A9 and Kirumi Isumbirira, Late Stone Age and Iron Age practices coexisted possibly until 200 years ago or even much later before the site was finally abandoned. Meat seems to have been eaten, but if the amount of bone refuse is a reflection of the amount of meat consumed, it could not have been a very important item on the menu. The Late Stone Age occupants may also be credited with authorship of the rock paintings. Besides the ochre stratified together with the archaeological deposits, a big rectangular rubbing stone (12.91 x 8.5 cm.) (Fig. 47) covered with red pigment on one of its flat face and some of the edges was found. The pigment appeared very much like that one used in the rock art at Kwa Mwango but a statement about this is reserved for the section on rock art.

Table 12: Summary of the total lithic assemblage and associated finds at Kwa Mwango.

Categories	Trench I	Trench II	Total	Percentage
Tools	1125	486	1611	5.53
Cores	1577	947	2524	8.66
Flakes	2124	2083	4207	14.44
Waste	14752	6041	20793	71.37
Total	19578	9557	29135	100.00
Beads	24	21	45	
Awls	4	3	7	
Bone & shell	1035gm	347	1382	
Pottery	28	3	31	
Ochre	31	26	57	

Table 13: Summary of the lithic assemblage and associated find at Kwa Mwango Trench I by layers

Categories	LAYERS							RAW MATERIAL PERCENTAGE					
Occurrences	Surface 1	1 2	2 3	3 4	Burial 5	Total	%	Quartz	Quartzite	Obsidian	Lava	Chert	Other
Tools	385	214	269	224	33	1125	5.75	91.58	6.91	0.27	0.44	0.1	-
Cores	407	411	399	281	79	1577	8.05	94.27	4.27	0	1.18	-	-
Flakes	549	640	480	370	85	2124	10.85	91.04	5.24	0.15	0.82	0.31	0.36
Waste	2946	3924	5174	1788	920	14752	75.35	93.79	4.51	0.13	1.21	0.30	-
Total	4287	5189	6322	2663	1117	19578	100.00						
Beads	-	1	9	12	2	24							
Awls	2	2	-	-	-	4							
Bone & Shell	139gm	342	172	44	338	1035							
Pottery	1	4	17	5	1	28							
Ochre	6	3	11	6	5	31							

Table 14 : Stratigraphical distribution of the tool categories in Trenches I and II at Kwa Mwango

Tool Categories	Surface	Trench I Levels			Burial	Trench II Levels			Total	Percent
		1	2	3		1	2	3		
Occurrences	1	2	3	4	5					
Crescents	18	8	10	12	-	30	-	-	78	4.69
Triangles	12	5	-	6	-	14	2	-	39	2.35
Trapezes	19	14	12	8	-	13	5		71	4.27
Backed flakes/blades	28	21	13	27	4	30	6	-	129	7.76
Casually wrkd flks/blds	16	19	23	20	-	13	-	-	91	5.47
Truncated flakes	7	3	3	1	-	9	-	1	24	1.44
Borers/becs	10	3	3	5	1	8	3	3	36	2.16
Spikes	-	1	15	6	2	15	-	-	39	2.35
Fabricators	2	2	2	-	-	5	2	-	13	0.78
Burins	-	-	4	-	-	2	-	-	6	0.36
Outils écaillés	38	27	68	31	10	90	7	3	274	16.48
Denticulates	10	7	5	7	-	13	-	-	42	2.53
End scrapers	9	3	5	9	-	5	2	-	33	1.98
Side scrapers	32	24	10	8	2	14	3	-	93	5.59
Core scrapers	18	7	6	7	2	9	1	-	50	3.01
Convex scrapers	9	4	2	1	1	6	-	-	23	1.38
Nosed scrapers	7	-	1	-	-	-	-	-	8	0.48
Irregular scrapers	13	6	11	2	-	6	-	-	38	2.29
Trimmed waste	87	29	33	38	5	70	14	-	276	16.60
Utilized flakes	47	28	42	36	6	75	5	1	240	14.43
Rubbing stone	3	3	1	-	-	1	-	-	8	0.48
Beads	-	-	9	12	3	18	3	-	45	2.71
Awls	2	2	-	-	-	3	-	-	7	0.42
TOTAL	387	216	278	236	36	449	53	8	1663	100.01

<u>Kirumi Isumbirira (ca. 4° 6' S 34° 43' E)</u>

Kirumi Isumbirira is one of several rock painting sites visited and recorded by the Kohl-Larsens in their "Deutsche Afrika-Expedition 1934-1936". They referred to it as <u>Kirumi-wand</u> and described the subject matter depicted in the art (Kohl-Larsen 1938:35-36), but did not attempt to describe the environmental and physical setting up of the site.

Like Kwa Mwango, Kirumi Isumbirira is in the country of the Wanyisanzu people and about 3 km. west of Kwa Mwango. The site can easily be reached from Matongo shopping centre by heading towards the local administrative headquarters of Kirumi and by taking a right turn 300 m. before the latter. The site should then be about 100 m. away from the road down the gradual slope in the midst of a cultivated low lying strip of land bordered by rocky ridges on both sides.

The site is in a huge exterior cave measuring roughly 18 x 6.30 m. and oriented in an east-west direction. The cave is formed by an impressive dome-shaped overhang supported by four huge boulders. The overhang is oval in plan view and about 23 x 13 m. (Fig. 16). At the lowest point, the roof of the overhang is about 3.25 m. high. The area of the floor inside the cave is considerably reduced by the boulders which support the overhang.

The physical and environmental setting is to that of

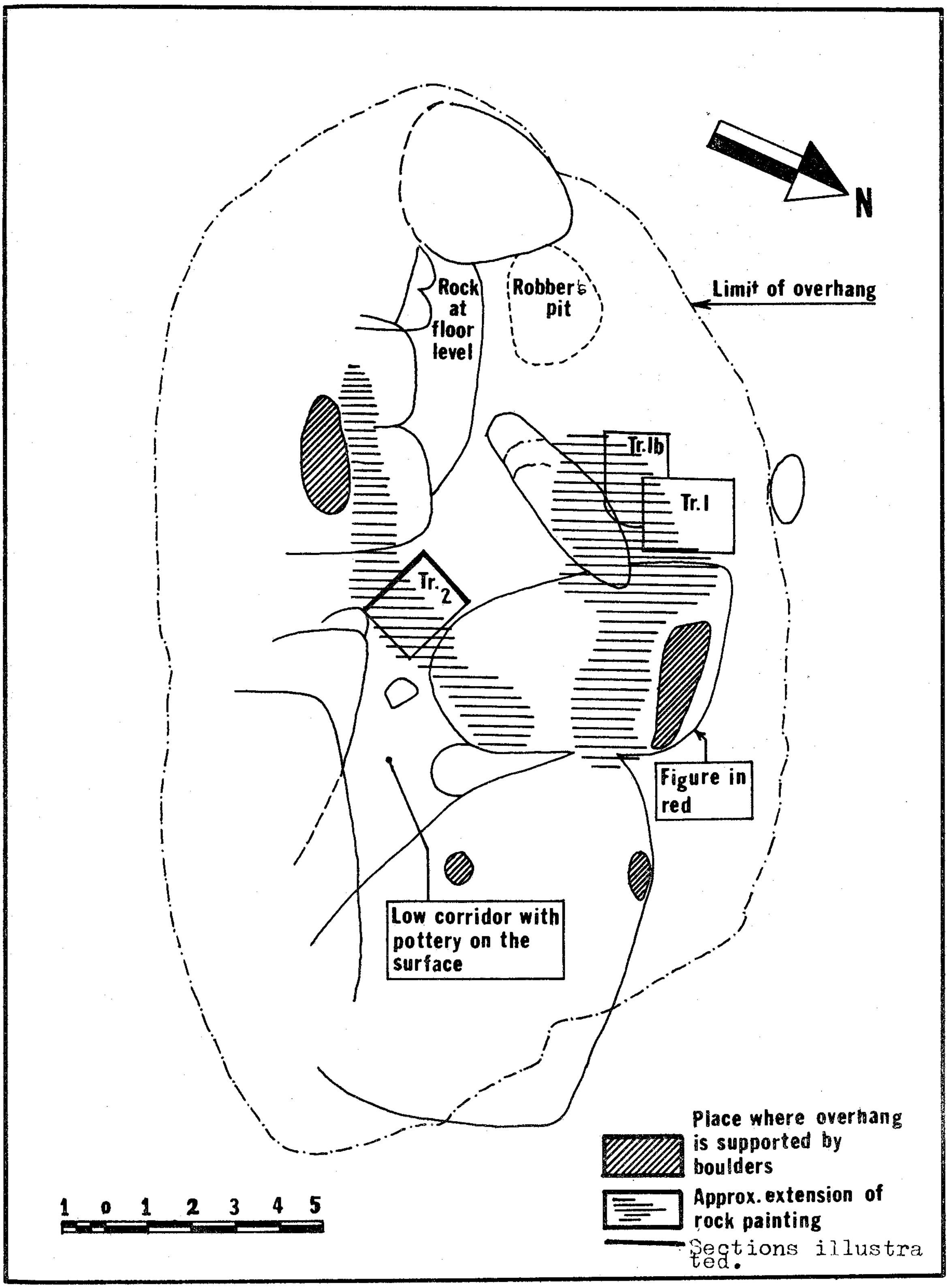

Fig. 16 Plan of Kirumi Isumbirira Rock shelter-cave.

Kwa Mwango. In both cases, there are several granite or syenite outcrops studded on the landscape. Where the natural vegetation has not been slashed and burnt to make room for cultivation, it is composed of thick wooded bush. However, it should be mentioned that there is one other rock shelter 100 m. away from the site which had rock paintings, but the paintings have now been so much obliterated by physical and chemical action that all that is left is a faint patch of red pigment. Search for any source of water near the site was unsuccessful, but about 1.5 km. to the southeast is a fountain which runs with water during the rainy season and for a few months after. An interesting finding was made by a crew member, Dr. G. Liesegang who discovered what looked like Acheulian artifacts eroding from a gully about 400 m. west of the site. Among the artifacts we picked up was a biface, a cleaver, a core and a big levallois flake. It is planned to return to the site for a more thorough search.

As previously pointed out, Kirumi Isumbirira does not only contain stratified archaeological deposits, but has pictographs executed predominantly in shades of white and a few in shades of brown. The art is all naturalistic, depicting, _inter alia_, animals such as the giraffe and the leopard. The accomplished piece of art, especially in the white pigment is generally poor compared to paintings done in red.

The Excavation: Two cuttings, each 2 x 1.5 m. were made, trench I at the northern entrance of the cave and trench II right inside the cave and about 4 m. east of trench I. Later trench I was enlarged by a 1 x 1.30 m. trench in the southwest quarter (trench Ib). Excavation was conducted in arbitrary levels of 10 cm., each of which is treated as an occurrence. However, due to the scarcity of artifacts, it was decided to lump every next 5 levels together after level 8 (trench I) and level 7 (trench II).

Trench I. Stratigraphy: The section drawings for trench I were misplaced during transit, but altogether, 6 distinct stratigraphical units were recognized. A few artifacts and pottery of recent origin was collected as the surface was cleared. The top layer, 10 cm. thick was a dark brown clayey soil with many rootlets. Many artifacts, mostly of quartz, pottery and a bovid tooth were collected. Overlaid by the clayey layer was stratum 2, a silty sand layer with many slabs and boulders some of which were decayed. Artifacts and charcoal were recovered in large amounts but pottery diminished.

Stratum 3 was 30 cm. thick almost all round. Basically it was composed of a silty clay with occasional concentration of gravel. The colour was almost consistently brown but different shades were observed depending on the nature of the decomposing rock in the area. In the southern part of the trench, a very high concentration of quartz artifacts and a piece of bone, possibly a human tibia, was observed. Further investigation revealed a post-occupational cut and backfill suggestive of a burial. For this reason, this part of the trench was left intact for further excavation. Artifactual recovery was observed to decrease with depth. Stratum 4 was approximately 35 cm. thick and was taken down to 1.00 m. Essentially it was composed of large and generally loose grains of gravel. Soil colour was observed to change from light brown to dark brown with depth. To the eastern face of the trench the lower part of a huge boulder was gradually dipping in. In the areas close to the boulder, density of artifacts was slightly greater. Towards the northern part of the trench the soil was loamy and rather dark, probably due to a huge slab of rock covering almost the whole face. Horizontal artifactual distribution was very irregular.

Stratum 5 was more loose and contained more gravel than the overlying one. It was about 70 cm. thick. The few lithics recovered from the lower parts of this stratum were generally larger and suggestive of an intermediary phase between Middle Stone Age and Late Stone Age. Due to the almost sterile nature of the deposits, strata 5 and 6 were not excavated in levels of 10 cm., but in 50 cm. instead.

Except for a few pebbles, stratum 6 was consistently soft and loamy. Two large cores came from the northeast corner of the trench, otherwise no other artifacts were found. At a depth of 3.70 m. it became difficult to dig any further down due to the huge boulder which at a depth of 3.00 m. dipped westwards so much so that it almost closed in with the west face of the trench. No sterile deposit was reached, but as has already been pointed out, after a depth of 90 cm.

from the top, the number of artifacts diminished very much, sometimes at the rate of one lithic chip per three screenfuls of earth. There were also imminent dangers of a cave-in.

Trench I B This was a 1 x 1.3 m. extension of trench I on its southwestern quarter. The purpose was to excavate the fill that was observed earlier and thus expose what was suspected to be a burial. In like manner it was dug in levels of 10 cm. each down to 70 cm., which was the depth indicated by the fill. The artifacts recovered were bagged separately but during the analysis they were tallied together with those from trench I.

The Burial: Other than the teeth nothing else of the burial seems to have preserved, not even the long limb bones. At a depth of 70 cm. an area of soft ashy soil was exposed. The teeth and very friable and fragmentary pices of jaw bones were found in the soft ashy soil. Altogether, 40 teeth were found suggesting that there may have been more than one individual buried there. Some of the teeth were small and hardly worn out at all while others were definitely of an adult. From the position of the limb bone found previously and presumably associated with the burial it would appear the head was oriented towards the east with the lower part of the trunk facing roughly northwest. No grave goods were found and it is very doubtful whether it was a complete burial. My suspicion is that it was a partial burial perhaps associated with witchcraft.[17]

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[17] In historical times many tribes practised a form of witchcraft whereby human skeletons were exhumed in part and then reburied in another place. This was believed to ward off vengance from befalling the wizard or witch and put the dead person's spirit in the hands of the wizard or witch.

Trench II A 2 x 1.50 m. trench was cut right in the centre of the cave. The surface was littered with huge boulders. Except for three feldspar beads similar to the one found associated with the burial at Kwa Mwango, artifactual recovery was very much like that of trench I.

Stratigraphy: (Fig. 17) Four major stratigraphical units were recognized. The top layer was a thin (10 cm.) loose black humus. Stone artifacts, pottery, shell beads, charcoal and small pieces of bone were recovered.

Stratigraphical unit 2 was fairly compacted silty clay, mottled here and there with gravel and huge slabs of rock. It varies from 30 cm. - 45 cm. in thickness. It was the richest layer in archaeological deposits. Underlying this was stratum 3, composed of silty sand with many boulders some of which were in the process of decomposing. This was 60 cm. thick nearly all round. The density of artifacts was very much reduced.

Stratum 4 was essentially sandy and light brown in colour with very few and small boulders. Density of artifacts was further reduced. This was taken down to a depth of 3.00 m. at which further digging was stopped partly because of the low recovery of artifacts (one lithic chip for every 5 screenfuls of dirt) and partly because of the looseness of the soil and occasional breaking of the sides of the trench.

Dating: On the basis of typological similarities, the assemblage at Kirumi Isumbirira was suspected to be temporally contemporaneous with those from Kandaga A9, Majilili 2B and Kwa Mwango. However, inference of age based on typological

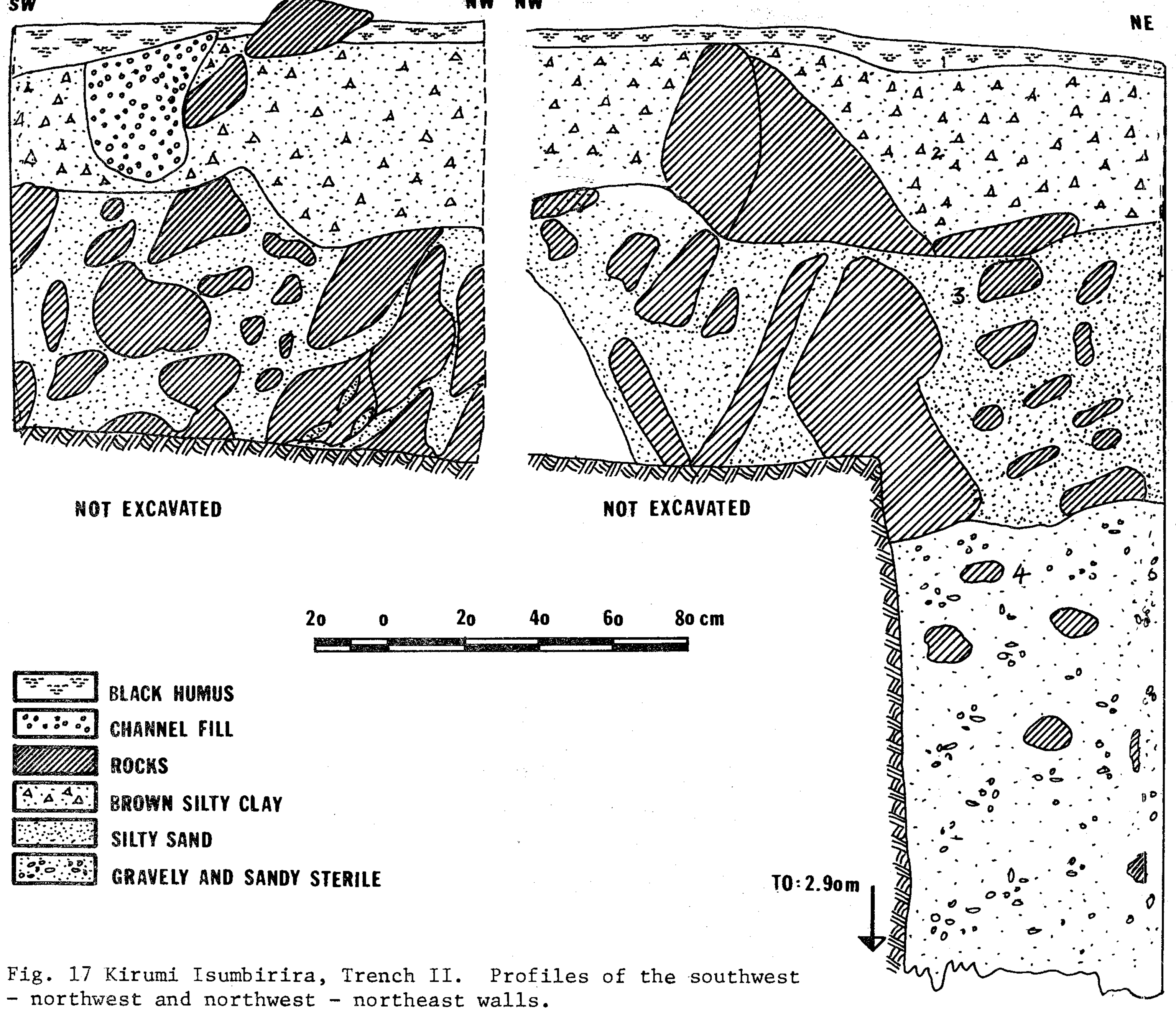

Fig. 17 Kirumi Isumbirira, Trench II. Profiles of the southwest - northwest and northwest - northeast walls.

similarities or differences alone, is not always a reliable measure of contemporaneity. Three samples for C14 were therefore collected but only two of these have been dated. A charcoal sample from trench I, level 5 has given a date of 3665±140 C14 years B.P. (1715±140 B.C.) (Gx-3681), while a bone sample from trench I, level 6 has been dated to 740±150 C14 years B.P. (Gx-3682). The bone sample came from the south-western part of the trench and it is suspected it was stratigraphically displaced by the digging of the burial and perhaps associated with the latter, although no stratigraphical disturbance was observed near the area where the sample was collected. The charcoal sample was collected from in situ in the central part of the trench. The date of 750±150 C14 years B.P. is much too recent for the industry in level 6, which has no pottery or any other Iron Age elements, especially when an older and more reasonable date of 3665±140 C14 years B.P. (charcoal is more reliable than bone) has been obtained 10 cm. above it. The later date could be accepted for the upper deposits (levels 1, 2, 3, 4,) but as it will be apparent in Chapter 4, it should be disregarded. The older date compares well with the older dates for Kandaga A9 (3375±180 C14 years B.P.), Kwa Mwango (3270±100 C14 years B.P.), and Lululampembele (3830±180 C14 years B.P.) (Odner 1971:193); and as has already been discussed under the other sites included in this study, it is within the later range of the East African Late Stone Age. The Late Stone Age in East Africa, may perhaps be as old as 15,000-20,000 years at some sites such as Kisese II, Lukenya, Buvuma Island, Olduvai Gorge and Prolonged Drift (Deacon 1966, Gramly 1975) or as late as 700 years as at Magosi (Nelson 1973). But as it has been argued in the cases of Kandaga A9, Kwa Mwango and Kirumi Isumbirira, Late Stone Age technology can be shown to have survived to modern times. In such instances, Late Stone Age and Iron Age cultures do not only coexist, but supplement each other. It was mentioned earlier that the oldmen Wanyisanzu are known to prefer obsidian and quartz flakes to razor blades. Many tribes still use grinding stones to grind millet and elusine. It should be mentioned that Kwa Mwango, Kirumi Isumbirira and Lululampembele are more or less in the same biogeographical zone and fairly close to one another. All the C14 dates for the three sites discussed here will again be critically examined in the light of the Late Stone Age industry in East Africa.

The Assemblage: The assemblage at Kirumi Isumbirira is conveniently summarized in Tables 15 - 18. As with the other three sites discussed here, quartz is the main raw material accounting for 90.63% of all the tools, while quartzite, the other raw material accounts for only 5.33% of all the tools. In comparison 4.18% of the total assemblage at the nearby site of Kwa Mwango is made from quartzite. Gabel (1965) argues that there is no really clear correlation between craftsmanship and material since examples of both poor and excellent quality occur in both quartz and quartzite (Gabel 1965:32). However, the present author maintains that not only does such correlation exist with quartz and quartzite but also with cryptocrystalline quartz The few microlithic geometrics made from cryptocrystalline quartz and obsidian from the four sites clearly show a higher degree of technological control, and excellent craftsmanship. It should however be pointed out that Gabel's study is based on the Gwisho site which being in a different geographical region would presumably contain industries manifesting regional and technological specialization of a different degree from those of East Africa. In any case the issue of the relationship of raw material and quality of tools made from it is not very well understood. Some authorities (Mason 1969:297-298), argue that there is a close correlation between the two while others have argued that differences in the quality of material was not a significant factor (Gabel 1965:50).

The category of tool types is in many ways similar to those of the other three, but closer to that of Kwa Mwango. Both have an appreciable amount of ochre and pestle rubbing stones, some of which are stained with pigment. Like Kwa Mwango and unlike Kandaga A9 no Iron Age artifacts besides pottery and some beads were found.[18]

The vertical distribution of the assemblage at Kirumi Isumbirira shows a gradual reduction of artifacts with depth, suggesting that the site was perhaps more intensively occupied especially during and after the time represented by level 6. Pottery, bone and ochre do not occur beyond level 6. It has

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[18]Pottery is now known from associations with Late Stone Age industries and the view that all pottery was Iron Age is no longer fervently held. (See Sutton 1971:146).

not been possible to properly designate the pottery, because until recently the tendency in East African archaeology has been toward the use of monothetic pottery types, and this approach has made it difficult to develop comparative regional chronologies (Schmidt: in press: 2). The presence of Iron Age pottery means that the occupants had acquired a knowledge of iron working or had come into contact with Iron Age people. This may have enabled them to exploit their microenvironment more efficiently, and hence the more intensive occupation as suggested by the artifacts and bone refuse. However, the C14 date of 3665±140 B.P. obtained from level 5 does not support this speculation as it would be too early for the Iron Age. Perhaps prior to level 5 times, the site was used intermittently for short periods. Level 6 has also the largest amount of animal teeth and this may be a reflection of the intensive occupation. None of the teeth belong to cattle and as such the Late Stone Age/Iron Age occupants were hunter-gatherers rather than pastoralists.

In spatial relationship, the distribution of the artifacts, as with the case of Kandaga A9 and Kwa Mwango, delineates activity areas. Thus, for instance, trench I which was located outside the cave, just under the drip line accounts for 80-90% of the total assemblage, which even discounting the larger area of trench I is still considerably higher than the assemblage from trench II (19.10%) (Tables 15,18). The latter was located in the middle part of the cave.

The overall pattern of distribution of the different tool types is also within the range of Late Stone Age sites in

East Africa. Tools (shaped, trimmed waste and utilized flakes) account for 4.53% of the whole assemblage while at Kwa Mwango, tools make up 5.52% of the whole lithic assemblage. This compares well with Lululampembele 3.5%, Nsongezi 3.8% and Nyabusora 4.5% (Odner 1971; Nelson 1973). The most frequent tool types are outils écaillés 18.92%, followed by trimmed waste 17.34% and utilized flakes 15,57% while all the scrapers lumped together add up to 12.99% of all the tools. The respective percentages at Kwa Mwango are outils écaillés 16.48%, trimmed waste 16.60%, utilized flakes 14.43%, and scrapers 14.73%. Both Kirumi Isumbirira and Kwa Mwango record a higher percentage of outils écaillés than either Majilili 2B (9.58%) or Kandaga A9 (6.94%). Perhaps this disparity reflects regional differentiation attendant upon differential economic specialization. The percentage of scrapers compares less favourably with 22.5% at Lululampembele, 41.7% at Nsongezi, 17.8% at Nyabusora and 17.4% at Seronera (Nelson 1973; Odner 1971; Bower 1973).

The percentages for geometric microliths (crescents 7.69%, triangles 1.70% and trapezes 2.27%) also compare well with Kandaga A9 and Kwa Mwango. The relative proportion of crescents is higher at Kirumi Isumbirira, though not as high as 15.8% for crescents and triangles at Nsongezi rock shelter (Nelson and Posnansky 1970:170). Burins, truncated flakes, denticulates and becs retain a realtively low proportion in all the assemblages considered here. It is argued later in this study that the almost absence of some Late Stone Age tool types such as the burins has some significance in distinquishing some assemblages as a variant of the Late Stone Age industries.

A few non-lithic artifacts besides pottery were also recovered. These consist of shell and feldspar beads (1.25%) and one bone tool. The pottery was very fragmentary and impossible to restore. Most of the sherds were body sherds and as such are not very helpful in trying to reconstruct form and style. However, from the few rim sherds, most of the vessels represented would be globular jars though one or two sherds were part of a bowl. Decorative motifs and techniques were difficult to work out due to the wear but some of the sherds have rouletted and cord impressed decoration. The temper is mostly sand, and grit. A few of these are shown in Fig. 18. A full description of the pottery is given by Liesegang (Liesegang: in press).

The small amount of bone (393 gm.) recovered from Kirumi Isumbirira was too fragmentary for identification. However, if we assume that the amount of food refuse in a site is an indication of how important a particular food was, we can say that meat was perhaps not an important food item of the Late Stone Age occupants at the site unless it was eaten away from the site. On the other hand the cave site may have been used for ritual functions, or as a factory site, and therefore food refuse would be minimal. In addition to the fragmentary bone, a few teeth were recovered and identified as follows:

Trench I Level 2

a. bovid tooth fragment

b. Ulnar carpal - possibly of Bos sp.

Minimum 1 animal represented

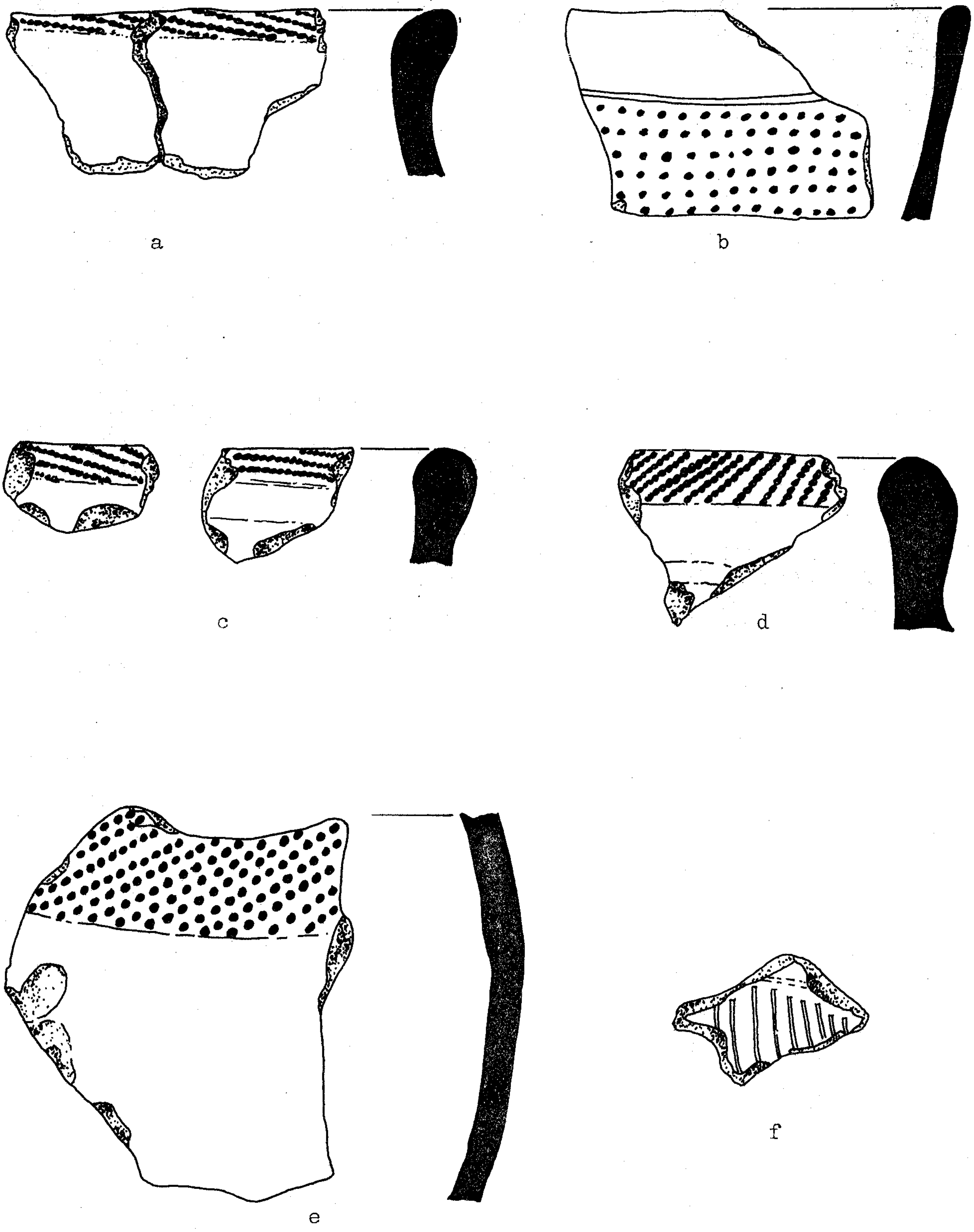

Fig. 18 Pottery from Kirumi Isumbirira, Tr. I layer 1 (a-d) and layer 2 (e-f)

Trench I Level 6

a. 2 badly abraded incisors - medium-sized bovid

b. 2 bovid tooth fragments

c. fragmentary lower molar of Gazella sp.

d. badly worn, fragmentary lower gazelle molar

e. molar "bud" of small-sized bovid

f. molar - bovid - possibly gazelle

Minimum 3 animals represented

Until now the post-cranial animal bones have not yet been identified and therefore any conclusions based on the faunal data must be tentative. However, it may be assumed that the teeth and the other bones belong, most likely, to the same species.

Trench II Level 5

a. 2 molar fragments of medium-sized bovid

Minimum 1 animal represented

Ochre occurs throughout until level 6 in trench I. Some of it is polished and striated, thus recalling what Leakey (1936) and Inskeep (1962) referred to as pencils. Whether the ochre was the source of the pigment employed in the rock art, used for body adornment or more likely for both will remain unknown for some time. It is reported for instance that numerous natural and mineral pigments were used by the Wilton people for decorating the body and for rock art (Willcox 1963). Skeletal remains attest to the custom of smearing corpses with red ochre (Gabel 1965:7). A tuft of hair from the burial at Kwa Mwango, for example, was also smeared with ochre, while the Masai and the Man'gati still use red ochre mixed with animal fat for the hair.

Summary

The four sites described in this chapter are all rock shelter/cave sites with rock paintings, the latter probably or possibly associated with the archaeological deposits. The assemblages display features which can be used for inter-site comparisons of the Late Stone Age in central Tanzania, and at a broader regional level of analysis, of the East African Late Stone Age. In all cases the raw material used is almost exclusively quartz, although in some artifact categories, quartzite, obsidian and chert may together account for 10% of the raw material, especially at Kwa Mwango and Kirumi Isumbirira. Overall, there is a paucity of real blades, and the industry belongs to a flake rather than a blade industry. Certain tool types occur in more or less comparable proportions. Outils ecailles, scrapers, utilized flakes, and nondescript trimmed pieces score the highest frequencies throughout, followed by geometric microliths and backed flakes. Points and bifacially worked pieces are virtually non-existent, while burins and bone tools other than ostrich egg shell beads are rare. With the exception of the assemblage from Majilili 2B, the faunal data retrieved suggest that hunting game animals was one of the activities that the makers of the industry indulged in. The C14 dates so far obtained from the three sites also suggest a temporal time interval of between 3500 years and late Iron Age or modern times. The upper time limit is also corroborated by late Iron Age artifacts such as pottery, slag and metal objects especially in the upper stratigraphical units, and present-day oral traditions and ethnographies attesting to the use of rock shelters in present and historical times. The implication of this is that Late Stone Age technology was not replaced by Iron Age technology at the time of introduction of the latter, but both technologies seem to have coexisted and supplemented each other.

On the other hand, there are minor localized inter-site and intra-site features which may distinguish one assemblage from another. For instance in terms of tool types and raw material, the assemblages from Kwa Mwango and Kirumi Isumbirira are more comparable (Tables 12-18) while at Majilili 2B, the tools are generally larger in overall size and the retouching crude. The raw material at Majilili 2B is also 100% quartz. Majilili 2B is also the only site where faunal remains were completely absent. The spatial and temporal distribution of artifacts was slightly different, not only between sites but even within sites, perhaps delineating regional specialization and activity areas. However, based on the data from the four sites (Kandaga A9, Majilili 2B, Kwa Mwango and Kirumi Isumbirira), Kisese II (Inskeep 1962), Lululampembele (Odner 1971), Seronera

(Bower 1973) and Nyangoma (Soper, et al. 1969), it can be said that the Late Stone Age of central Tanzania, is basically a microlithic flake industry with a temporal range from 3,500 to about 200 B.P. However an earlier date of 18,190±306 B.P. was obtained from an occurrence transitional to the Late Stone Age at Kisese II (Nelson 1973:34). The subject of comparability and variability is discussed in detail in Chapter 4.

Table 15: Summary of the lithic assemblage at Kirumi Isumbirira

Category	Trench I	Trench II	Total	%
Tools	1272	314	1586	4.53
Flakes	5038	991	6029	17.20
Cores	2932	806	3738	10.67
Waste	19108	4582	23690	67.60
TOTAL	28350	6693	35043	100
%	80.90	19.10	100	

Table 16 : Summary of the lithic and nonlithic archaeological deposits at Kirumi Isumbirira, Trench I.

LITHIC	Surface	LEVELS (occurrences) 1-2	3-4	5-6	7	8	9	10	11	12	13	Burial Fill	Total	%
Tools	24	454	246	319	71	19	16	14	10	10	5	84	1272	4.49
Flakes	41	2282	893	887	195	61	35	17	30	27	17	553	5038	17.77
Cores	32	1113	688	673	101	63	27	14	38	30	29	124	2932	10.34
Debris	362	7383	4069	4320	825	312	154	141	211	149	201	978	19105	67.39
Other	-	3	-	-	-	-	-	-	-	-	-	-	3	0.01
Total	459	11235	5896	6199	1192	455	232	186	289	216	252	1739	28350	100
NON-LITHIC														
Beads	-	15	-	-	-	-	-	-	-	-	-	-	15	
Bone tools	-	1	-	-	-	-	-	-	-	-	-	-	1	
Pottery	31	387	203	-	-	-	-	-	-	-	-	20	641	
Shell and bone by weight	10	204	11	93	-	-	-	-	-	-	-	27	345gm	
Ochre by weight	-	104	156	115	-	-	-	-	-	-	-	19	494	

Table 17 : Summary of the lithic and non-lithic archaeclogical deposits at Kirumi Isumbirira, Trench II.

		LEVELS (occurrences)									
LITHIC	Surface	1-2	3-4	5-6	7	8	9	10	11	Total	%
Tools	22	99	110	45	15	8	9	3	3	314	4.69
Flakes	30	540	275	70	26	19	15	13	3	991	14.80
Cores	41	400	230	71	17	15	18	12	2	806	12.04
Debris	95	2316	1295	584	81	73	80	49	9	4582	68.44
Other*	-	1	1	-	-	-	-	-	-	2	0.03
Total	188	3356	1911	770	139	115	122	77	17	6695	100 -
NON-LITHIC											
Beads	1	1	-	3	-	-	-	-	-	5	
Pottery	54	36	-	-	-	-	-	-	-	90	
Shell and by weight	4	43	-	-	-	-	-	-	-	48gm	
Ochre by weight	56	507	105	10	1	-	-	1	-	680gm	

* Others: The first one is a piece of soapstone ?pipe, the second item is a small polished pebble.

Table 18 : Summary of the tool category and the raw material at Kirumi Isumbirira

	Trenches				Raw Material			
	I	II	Total	Percentage	Quartz	Quartzite	Obsidian	Other
Crescents	105	17	122	7.69	6.90	0.56	0.13	0.06
Triangles	22	5	27	1.70	1.63	0.00	0.06	0.00
Trapezes	31	5	36	2.27	1.94	0.13	0.18	0.00
Backed flakes	117	29	146	9.21	8.53	0.44	0.13	0.06
Casually Worked flakes	74	20	94	5.93	4.95	0.82	0.13	0.00
Truncated flakes	6	0	6	0.38	0.38	0.00	0.00	0.00
Becs	8	3	11	0.69	0.75	0.00	0.00	0.00
Denticulates	22	1	23	1.45	1.25	0.19	0.00	0.00
Burins	14	0	14	0.88	1.20	0.25	0.00	0.00
End scrapers	20	3	23	1.45	1.25	0.31	0.00	0.00
Side scrapers	82	28	110	6.94	6.34	0.44	0.06	0.06
Core scrapers	31	12	43	2.71	2.63	0.00	0.00	0.06
Irregular scrapers	11	5	16	1.01	1.00	0.00	0.00	0.00
Nosed scrapers	2	2	4	0.25	0.25	0.00	0.00	0.00
Convex scrapers	10	0	10	0.63	0.63	0.00	0.00	0.00
Outils écaillés	217	83	300	18.92	18.26	0.50	0.00	0.06
Fabricators	14	2	16	1.01	0.94	0.06	0.00	0.00
Trimmed waste	250	25	275	17.34	16.88	0.38	0.00	0.00
Utilized flakes	192	55	247	15.57	13.92	1.13	0.44	0.00
Spikes	16	6	22	1.39	1.25	0.06	0.00	0.06
Pestle/rubbing stones	12	7	19	1.20	0.00	0.06	0.00	1.19
Beads	15	5	20	1.26	0.00	0.00	0.00	1.25
Bone tools	1	0	1	0.06	0.00	0.00	0.00	0.06
Soapstone ?pipes	0	1	1	0.06	0.00	0.00	0.00	0.06
Total	1272	314	1586	100	90.63	5.33	1.13	2.86

Table 19 : Stratigraphical Distribution of tool categories in Trench I, Kirumi Isumbirira.

Tool Categories	Surface	Levels (occurrences) 1-2	3-4	5-6	7	8	9	10	11	12	13	Burial Fill	Total	%
Crescents	4	38	23	29	4	2	1	1	-	-	-	3	105	8.25
Triangles	2	5	3	7	1	1	-	1	-	-	-	2	22	1.73
Trapezes	1	10	3	9	2	1	-	-	1	-	-	4	31	2.44
Backed flakes	2	43	24	31	7	2	-	-	-	-	-	8	117	9.20
Casually worked flakes	2	25	11	18	5	2	1	-	1	1	-	8	74	5.82
Truncated flakes	-	2	-	2	1	-	-	-	-	-	-	1	6	0.47
Becs/borers	-	3	1	2	-	-	1	-	-	1	-	-	8	0.63
Denticulates	1	8	2	8	1	-	-	-	-	-	-	2	22	1.73
Burins	-	4	1	4	2	-	-	-	-	-	-	3	14	1.10
End scrapers	-	6	3	4	2	1	1	-	-	-	-	3	20	1.57
Side scrapers	1	34	10	21	8	-	-	-	1	1	-	6	82	6.45
Core scrapers	-	13	4	7	3	-	1	-	-	-	-	3	31	2.44
Convex scrapers	-	5	1	2	1	-	-	-	-	-	-	1	10	0.79
Nosed scrapers	-	2	-	-	-	-	-	-	-	-	-	-	2	0.16
Irregular scrapers	1	3	-	2	-	-	1	2	-	2	-	-	11	0.86
Outils écaillés	3	80	47	53	10	2	3	-	3	2	-	14	217	17.06
Fabricators	-	5	1	3	1	-	1	-	-	-	1	2	14	1.10
Spikes	-	7	1	-	3	-	1	2	-	-	-	2	16	1.26
Trimmed waste	5	84	59	61	16	5	-	4	2	2	2	10	250	19.66
Utilized flakes	2	61	49	52	3	2	3	3	2	1	2	12	192	15.03
Rubbing stone	-	-	3	4	1	1	2	1	-	-	-	-	12	0.94
Beads	-	15	-	-	-	-	-	-	-	-	-	-	15	1.18
Bone tools	-	1	-	-	-	-	-	-	-	-	-	-	1	0.08
Total	24	454	246	319	71	19	16	14	10	10	5	84	1272	99.95

Table 20 : Stratigraphical Distribution of tool categories in Trench II, Kirumi Isumbirira

	Layers										
	Surface	1-2	3-4	5-6	7	8	9	10	11	Total	%
Crescents	2	5	6	3	1	-	-	-	-	17	5.41
Triangles	-	2	3	-	-	-	-	-	-	5	1.59
Trapezes	-	1	4	-	-	-	-	-	-	5	1.59
Backed flakes	2	9	11	4	1	1	1	-	-	29	9.24
Casually worked flakes	1	8	6	2	-	-	2	-	1	20	6.37
Truncated flakes	-	-	-	-	-	-	-	-	-	0	0.00
Becs/borers	-	1	-	1	-	-	1	-	-	3	0.96
Denticulates	-	1	-	-	-	-	-	-	-	1	0.32
Burins	-	-	-	-	-	-	-	-	-	0	0.00
End scrapers	-	2	1	-	-	-	-	-	-	3	0.96
Side scrapers	2	9	9	4	-	2	1	1	-	28	8.92
Core scrapers	-	3	4	2	1	-	1	-	1	12	3.82
Convex scrapers	-	-	-	-	-	-	-	-	-	0	0.00
Nosed scrapers	-	-	-	-	-	-	-	-	-	2	0.64
Irregular scrapers	-	2	2	-	1	-	-	-	-	5	1.59
Outils écaillés	8	22	26	16	5	3	1	1	1	83	26.43
Fabricators	-	-	2	-	-	-	-	-	-	2	0.64
Spikes	-	1	2	1	-	1	1	-	-	6	1.91
Trimmed waste	3	11	8	2	1	-	-	-	-	25	7.96
Utilized flakes	3	17	22	6	4	1	1	1	-	55	17.52
Rubbing stone	-	2	3	1	1	-	-	-	-	7	2.23
Beads	1	1	-	3	-	-	-	-	-	5	1.59
Bone tools	-	-	-	-	-	-	-	-	-	0	0.00
Soapstone ?pipe	-	-	-	-	-	-	-	-	-	1	0.32
Total	22	99	110	45	15	8	9	3	3	314	100.01

CHAPTER 3

ANALYSIS AND DESCRIPTION OF THE ASSEMBLAGES

Introduction

As mentioned in Chapter 1, the Late Stone Age in East Africa is still far from being well known. As such, interest is presently focussed on identification of similarities between different collections of excavated material and museum specimens with a view to making regional comparisons. For this reason, the typological system presented in this thesis is comparable to that used by other prehistorians, especially those of Nelson (1973, Miller (1969), Gramly (1975), Gabel (1965, 1969) Clark (1974), L. S. B. Leakey (1947) and M. D. Leakey (1945). Although reference is made to Tixier's (1963) typology for *L'Epipaleolithique du Maghreb*, such reference is infrequent as the Epipalaeolithic of North Africa is not similar enough to the Late Stone Age of East Africa to warrant a complete adoption of Tixier's typology.

In reality, the best way to make comparisons between different collections is for the same analyst to study all the collections being compared, for two people examining the same collection are liable to come up with two different typologies. In awareness of this, the author visited Dr. Nelson to discuss some aspects of the typological system used in the Late Stone Age in East Africa and to see some of his Late Stone Age collection of artifacts. It is acknowledged that the foundation of any good archaeological research depends on sound regional chronologies. Such chronologies are presently lacking for the East African Late Stone Age partly because until recently most prehistorians were interested in the Earlier Stone Age and partly because most of whatever little research done on the Late Stone Age was concentrated in Kenya and a few sites in Uganda. It is the purpose of this study to add to the present cultural history for the Late Stone Age in East Africa. The data comes from four rock shelter sites in central Tanzania.

The analysis is mostly descriptive. Like the statistical analysis, descriptive methods must serve the needs of the general theory of which they are a part. Spaulding (1960a:442) has observed that:

> ...techniques for recognizing formal attributes logically precede the next problem that of studying artifact inter-relationships in terms of formal attributes----the recognized attributes serve as linking constants from artifact to artifact... . (Wilmsen 1970:6).

Ideally a descriptive prodcedure must embody a quantitative analysis of the attributes but as Spaulding (1960a:439-41) has argued, any attempt to replace with measurements the current presence, or absence of observation of such attributes would be futile. Not all attributes are amenable to quantification and excellent interpretive results be obtained with the use of qualitative data alone (Wilmsen 1970:6). However most authorities would argue that a combination of both quantitative and qualitative analysis is essential for proper treatment of most archaeological data. How much each is used will obviously depend on the type of data to be analyzed and on the training of the student engaged in the research. The present study is basically interested in enhancing the East African Late Stone Age chronologies, and as such makes use of only simple quantitative analysis whenever appropriate, but otherwise the procedure is basically qualitative.

An implement can be defined in two different ways; by use (functional typology) an by form (morphological typology), but these two aspects are often related. In the present study, the classification is based on shape, size and modification rather than on assumed intended use, i.e. on empirical rather than inferential attributes. However, whenever there is supporting evidence, such empirical types will also be assumed to have inferential cultural significance. Such level of abstraction necessitates examining the types as parts of a whole, the assemblage. Morphological typology can as Bordes (1969:2) has pointed out, be an invaluable information about the lithic tool kit of prehistoric populations. Like other prehistoric people, the central Tanzania Late Stone Age people responded to the challenge of survival in their particular environment by fabricating the implements which were needed. Morphological typology therefore allows one to evaluate at one and the same time the implement needs of man such as he conceived and satisfied them and the traditions of the group or the group's particular response to its environment (Bordes 1969:2).

Morphological typology as argued by Bordes (1969) aims at establishing the constants of an industry at different levels depending on the refinement the investigator is seeking. Morphological analysis does not tell us much about the activities of the human group responsible for the implements. However, by isolating industries on an implement morphological basis, one can follow their development and eventually detect their interactions by the regularity of proportions of the types and by their variation. This approach is however, criticized because it is susceptible to the dangers of convergence. Other dangers associated with the typology are:

1) the tendency for the analyst to get lost in insignificant details or not to know how to separate what is important from what is not;
2) the difficulty to distinguish the three parts of an implement (the active part, the part of prehension or handle and the intermediate part which can occasionally disappear) from a strictly morphological point of view, but,
3) the greatest criticism against morphological typology is its inability to deal with intermediaries between types.

Functional typology on the other hand aims at determining the utilization of implements and to classify them according to this utilization by the study of traces of use or at other times, by analogies with modern implements. But analogies can be deceptive and the classification by functional types leaves in darkness, all that distinguishes an industry (Bordes 1969:9). The literature is replete with pro and con arguments about the use of ethnographic analogies in archaeology, but there is no intention in the present study to dilate upon this. It suffices to reiterate that in the present analysis, the typology used is largely morphological.

The range of variability within the Late Stone Age industries in East Africa is quite broad. Thus different regional culture names such as the Kenya Capsian, the Kenya Wilton (a,b,c), Elementeitan, Magosian, Tshitolian and Upper Kenya Aurigacian have been identified by such workers as Leakey (1929, 1931, 1936, 1947) and O'Brien (1939). This tendency of splintering the East African Late Stone Age based on monothetic artifact types is currently being eschewed in favour of a more regional wholistic approach (Nelson 1973). This means instead of assigning different culture names based on a few supposedly diagnostic artifact types or sites, the whole of the Late Stone Age is considered as made of industrial complexes. This does not however preclude the definition of appropriate industries when more comparative data are available.

The categories selected for the analysis of the four assemblages which form the corpus of this study are broad and flexible enough to facilitate comparison with published data relevant to the Late Stone Age. This has meant sacrificing minute details in artifact types in order to generate comparable classes at the levels of specificity relevant to the problem. Variation within some of the selected classes is shown by use of basic statistics and illustrations without attempting to suggest subtypes.

The term "industry" is used informally here because there has not been a consensus of opinion among African prehistorians about the precise meanings of such terms as "assemblage" and "industry", either as to the size of the artifact they represent, their contexts, or whether they are based on actual finds or theoretical combinations (Kleindienst 1967:823). However, according to Tixier (1963:33), the term "industry" embodies assemblages of objects manufactured by men belonging to the same population and lying in archaeological layers. Leakey (1953) used "industry" as the most specific formal unit, but considers it an associated group of implements found under conditions which show that they were used by a single family or group of people living together (Kleindienst 1967:826). Its looseness is further stretched when it is used in chronostratigraphic connotations such as the "Late Stone Age Industrial Complex." In this sense, the cultural significance of the term becomes subservient to the time significance meaning. The assemblages analysed here are considered to belong to one "industry" in the sense that they are composed of associated groups of implements made and used by groups of people practicing similar technology and living at more or less the same time. The assemblages are characterized by microlithic implements most of which are geometrics (crescents, triangles, trapezes, truncated flakes and backed flakes) and scrapers as the most dominant shaped tools.

The Typology

The assemblages are conveniently divided into four main categories, viz. tools (shaped and unshaped) cores, flakes and angular waste or debris.

Tools: In this broad category are included both shaped and unshaped tools. Shaped tools are artifacts characterized by deliberate and systematic modification resulting from retouch or trimming and conforming to some clearly recognized pattern of shape and size. The retouch may be alternate (*alterne*), alternating (*alternante*)[19], direct, normal, inverse, or invasive, or various combinations of these. Retouch may be shallow, steep, casual, bidirectional or unidirectional (Nelson 1973:138). Relative frequencies of formal shaped tools in the Late Stone Age of East Africa is generally variable, but the present data from central Tanzania shows that the frequencies are low compared with other East African Late Stone Age sites (Fig. 19, Table 21). Nelson (1973) has suggested that substantially higher frequencies of unshaped tools such as seen in the four sites here are correlated with occurrences which underwent redeposition or prolonged surface exposure before burial, while unusually low frequencies may indicate selective sampling on the part of the investigator. While this is true with some sites, the present writer, however,

[19] The first term is used by Tixier (1963) and refers to retouch which is worked along part or all of both edges of a piece, starting from the dorsal surface on one edge and from the ventral surface on the other edge. The second is used by Bordes (1961) and describes retouch which starts alternately from one surface then from the other on the same edge of a flake, blade or bladelet (Muto 1973:3). In this thesis "retouch" is used in preference to "trimming".

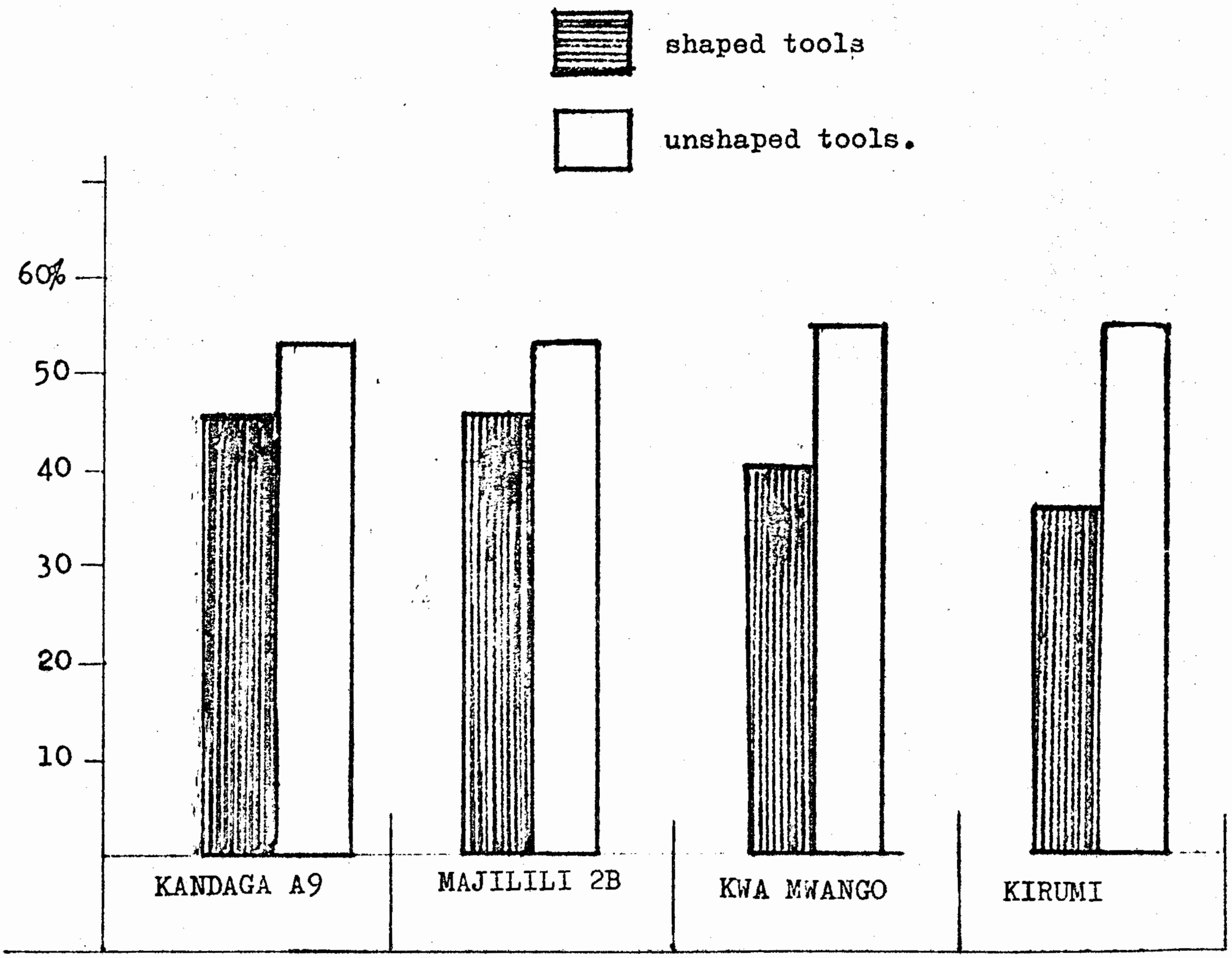

Fig. 19 Percentage frequencies of shaped and unshaped tools compared.

thinks the high proportion of unshaped tools are correlated with the raw material used and with what use part on the whole rock shelter was put to. Where the raw material is fine grained, e.g. obsidian and cryptocrystalline quartz, the proportion of finished tools will be relatively high. If the shelter or part of it was used as a workshop, the proportion of unfinished and unshaped tools will tend to exceed that of shaped tools. This is well illustrated by a comparison between trenches I and III at Kandaga A9 (Table 8). Shaped and unshaped tools intergrade with each other.

Unshaped tools may also be characterized by different types of deliberate retouch and trimming[20], but overall the modification is casual and unsystematic. The distinction between these and the shaped tools is that they do not seem to have a recognizable patterned morphology produced by systematic modification. The different artifact categories within the unshaped tools are not type-specific and as such are not very clearly defined. Consequently a high degree of intergradation within types is encountered. Under unshaped tools are also included artifacts which, although they do not show modification attributes, nevertheless show signs of utilization in the form of edge damage. Several prehistorians, (e.g. Fagan and Van Noten (1971:91); Mason (1967) have expressed the view that some of the flakes and blades in

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[20] Retouch implies edge modification in which the majority of marginal scars fall between 1.0 and 3.0 mm. in length. In the case of trimming, the majority of the marginal scars are greater than 3.0 mm. in length (Nelson 1973). This distinction is ignored because it has not been employed operationally.

Table 21 : Relative frequencies of tools* in 18 East African Late Stone Age assemblages after Nelson (1973), Odner (1971) and Soper et al (1969).

	Site	% Tools
Uganda		
	Nsongezi Rock Shelter	6.4
	Kansyore	11.8
	Nyabusora	4.5
	Nyero	28.0
	Iriri	5.3
	Kalukurok	13.0
	Magosi II	7.6(mean of 6 occurrences
Kenya Highlands		
	Muringa	2.4 - 3.8
	Tunnel Rock Shelter	31.88 (mean of 6 occurrences)
	Naivasha Rock Shelter	6.3 (mean of 2 occurrences)
	Prolonged Drift	13.4
	Nderit Drift	6.9 (mean of 4 occurrences)
Central Tanzania		
	Lululampembele	3.5
	Nyangoma	1.7
	Kandaga A9	2.64
	Majilili 2B	3.74
	Kwa Mwango	5.53
	Kirumi Isumbirira	4.53

*Tools includes both shaped and unshaped.

in Late Stone Age industries were undoubtedly used without having to modify them first. Both utilized flakes and outils écaillés are considered unshaped in this study. In all the four assemblages they account for relatively high proportions (Tables 8, 11, 14 and 18) and this may reflect their relative importance in the general tool kit. Nelson (1973:140, 142) has reported that frequencies for unshaped tools normally range from 4 to 16% of the flaked stone tools and hardly more than 20%. Contrary to this view, the present writer has found frequencies of over 50% in central Tanzania (Table 22).

The apparent disparity is perhaps more a reflection of differences of opinion as to what tools should be scored as shaped and what should be scored as unshaped than of differences in the assemblages. In the present analysis outils écaillés, retouched angular waste, utilized flakes, spikes, becs, casually retouched flakes and burins are not scored as shaped tools, but Nelson (1973:138-246) seems to score some of these (outils écaillés and burins) as such and hence the discrepancy. The reason for not treating them as shaped tools follows from the definition of shaped tools given earlier in this chapter; they do not seem to conform to an easily recognized pattern. It is also conceivable that there are minor differences between the assemblages studied by Nelson and those studied by the present writer, but such differences are difficult to evaluate without more chronologies for the East African Late Stone Age. Perhaps it should be mentioned that Nelson's data were drawn from both rock shelter and open air sites, mainly from Kenya and Uganda, while that analyzed here comes from rock shelters in central Tanzania. For comparison, the relative frequencies of unshaped tools in some of the assemblages studied by Nelson are reproduced here (Table 22). Microliths occur in the shaped as well as the unshaped tool categories.

Geometric Microliths: (Crescents, Triangles, Trapezes, Backed flakes, Truncated flakes).

These are small bladelets or segments of flakes and blades often, but not always geometric in shape that have been blunted by retouch (Clark 1970:154). Tixier (1963:127-129) uses the term "microlith" (pieces of small or very small dimensions) only with reference to geometrics and considers the absence of a talon on the blade or bladelet as one of the necessary though not sufficient characteristics. Similarly, writing about the Kaposwa Industry of Kalambo Falls, Clark (1974:124) has characterized the "microliths" category with well made lunates[21], trapezes and triangles.

In sub-Saharan Africa, it is customary to consider all small backed implements as microliths (Leakey 1931:95-96; Goodwin 1953:65-67, Nelson 1973:140-145). Sampson (1974) on the other hand has used the term "microlithic" to describe the small anvils, microliths, burins, borers, points and battered

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[21]The term "crescent" will be used in preference to "lunate" in this report to avoid duplication of names.

Table 22 : Frequency of unshaped tools from Late Stone Age occurrences in East Africa and central Tanzania, partly after Nelson (1973) and Odner (1971).

Assemblage		Sample	% Unshaped Tools
Nsongezi Rs/occ 1		42	9.5
occ 2		126	15.1
occ 3		40	10.0
occ 4		70	20.0
Kantsyore Island		611	10.8
Nyabusora Rs		22	9.1
Nyero Rs		194	14.9
Iriri		10	20.0
Kalokurok		131	8.9
Muringa Rs/lower occ		49	8.1
upper occ		281	5.0
Magosi 11 Rs/occ 1		489	10.8
occ 2		526	10.5
occ 3		478	10.9
occ 4		321	10.9
occ 5		311	10.9
occ 6		318	10.4
Tunnel Rs/occ 1		170	4.5
occ 2		170	4.5
occ 3		138	2.2
occ 4		104	2.9
Naivasha Ry Rs/occ 1		427	1.9
occ 6		2,451	3.0
Long's Drift		427	0.5
Prolonged Drift		435	21.1
Nderit Drift/sec T		129	17.8
sec CC		138	17.4
sec E		73	31.5
sec I		95	45.3
Kandaga A9	Tr I	486	56.58
	Tr II	332	56.02
	Tr III	694	51.44
Kwa Mwango	Tr I	1153	59.67
	Tr II	510	64.51
Kirumi			
Isumbirira	Tr I	1272	63.44
	Tr II	314	62.10
Majilili 2B		499	58.52
Lululampembele		280	24.29

crystals. He also uses the term "microlith" as a use inferential term and makes an unclear distinction between true backed blades and microliths (Sampson 1974:237,239). On the other hand, Odner (1971:185) has found it unnecessary to distinguish microlithic and macrolithic artifacts as the transition between the slightly larger and the smaller is gradual.

As far as size of microliths is concerned this has not been clearly defined and different authors have used different dimensional criteria. M. D. Leakey (1945) and Gabel (1965) for instance, have used 30 mm. as the dividing point between larger and smaller crescents, while Robbins (1968) accepts 30 mm. to distinguish between backed blades and crescents. Most authorities including Sampson (1970), Keller (1967) and Nelson (1973) appear reluctant to divide backed blades on the basis of length, a precedent adopted in this thesis. It is argued that:

> ...segregation of backed implements on the basis of size would constitute an unwarranted subdivision of a continuously occurring phenomenon whose documentation is better suited to the use of ranges, means and standard deviations ... (Nelson 1973:143).

In this study, size is considered subservient to shape and type of modification as a distinguishing criterion.

In North Africa, the terms "blade" and "bladelet" are well defined. Blades are those pieces whose length is twice or more than twice the width, are equal to or greater than 5 cm. in length and have a width equal to or greater than 1.2 cm. A bladelet on the other hand has a length which is twice or more than twice the width, and a width less than 1.2 cm. (Muto 1974:7).

If these criteria were to be applied in East, Central and South Africa very few assemblages would contain blades (Nelson 1973: 143). In fact none of the assemblages analyzed here would have any blades at all as the mean length of the flakes and blades is between 2.94±0.92 and 2.21±.07 cm. while the mean width ranges from 2.18±0.73 to 1.46±0.67 cm. In view of this the term "backed flake" should be used in preference for "backed blade". Posnansky (1967:105) has also reported that at Lanet where the industry is thought to be developed Late Stone Age, flakes rather than blades and bladelets were being struck.

On comparing the width/length ratios of geometric microliths with those of flakes and utilized flakes (Fig. 20) it is observed that the width/length ratio percentage ranges overlap with the higher ranges of those of flakes and utilized flakes and in all cases they are over 55%. This shows that the geometric microliths were made from flakes rather than blades which are almost nonexistent in the assemblages.

Microliths are an important component of the assemblages, and the same is true for the East African Late Stone Age assemblages as a whole (Nelson 1973:145). At the Gwisho A site, microlithic crescents (less than 30 cm.) constituted the largest group of implements (Gabel 165:32). Other than the backed flakes and the crescents which are by far the commonest microliths there are triangles, trapezes and truncated flakes. The last is not very well represented as shown in the Table below. Overall, the relative frequencies of geometric microliths from the richest implementiferous levels are variable but

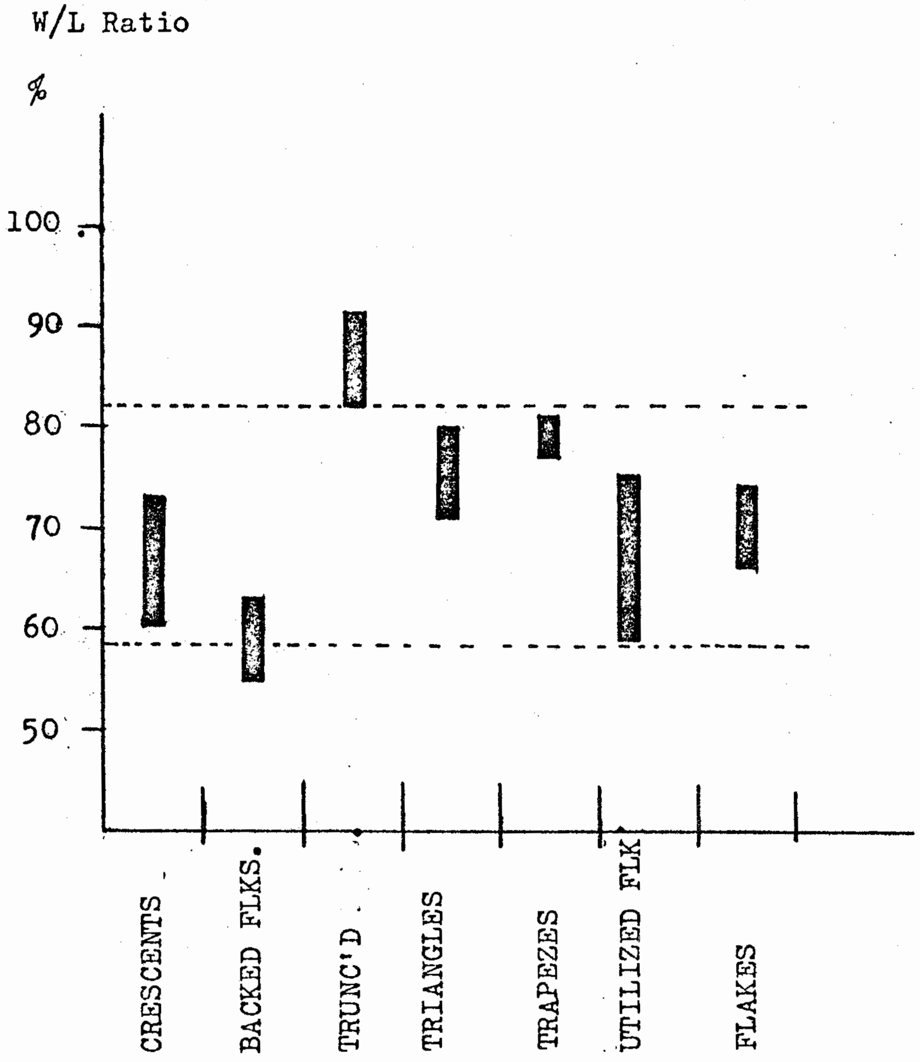


Fig. 20 Comparison of W/L ratio range of crescents, backed flakes, truncated flakes, triangles, utilized flakes, trapezes and flakes. This shows that the W/L ratio range of most geometrics and utilized flakes (broken lines) is comparable to that of flakes from which the above tool categories are made.

the variability is small. Kandaga A9, trench I was exceptionally rich in all artifacts.

Table 23: Absolute and percentage distribution of geometrics in the most implementiferous levels.

	KANDAGA A9 Trench I Levels 1-3	MAJILILI 2B Trench I Levels 1-3	KWA MWANGO Trench I Levels 1-3	KIRUMI ISUMBIRIRA Trench I Levels 1-3
Crescents	46 (9.31%)	10 (2.00%)	36 (3.12%)	48 (3.77%)
Triangles	14 (3.83%)	17 (3.41%)	17 (1.47%)	8 (0.63%)
Trapezes	6 (1.21%)	16 (3.21%)	45 (3.90%)	12 (0.94%)
Backed Flakes	51(10.32%)	9 (1.80%)	62 (5.38%)	58 (4.56%)
Truncated [illegible]	15 (3.04%)	4 (0.80%)	13 (1.13%)	2 (0.16%)
Total	132(26.71%)	56(11.22%)	173(15.00%)	128(10.06%)

(%) = percentage of all tools per trench.

A common feature in their modification is that they are all backed by near perpendicular retouch, and as Nelson (1973) has observed the majority of the microliths in East African occurrences are pointed. It should be pointed out that there is a high degree of intergradation especially between triangles and crescents on one hand and crescents and backed blades on the other.

Some authorities lump crescents, triangles and trapezes in one single category "geometrics". Tixier (1963:127-37) discusses these forms under geometric microliths, but he also distinguishes crescents, isoceles trapeze, assymetrical trapeze, rectangle trapeze, trapeze with one side concave, trapeze with two sides concave, trapeze with one side convex, isoceles or equilateral triangle, scalene triangle, triangle with one side concave, triangle with two sides concave, triangle with one side convex, elongated scalene triangle, elongated scalene triangle with one very short truncation, elongated scalene triangle with rounded angle, scalene piercer, scalene piercer with concave short truncations and scalene piercer with rounded angle.

This is a very meticulous breakdown of triangles, crescents and trapezes and while the distinction may have been necessary for the typology of the epipalaeolithic of the Maghreb, it is doubtful whether it would be of much use in studying the assemblages here, partly due to the small sample as well as the continuum in edge outlines. Furthermore, the distinction between triangles and crescents in sub-Saharan Africa has not always been clearly maintained. Thus, M. D. Leakey (1945:382-385) and Gabel (1965:32-34) have classified triangles as a variety of crescents. The latter author believes that the few triangles were "fortuitous having been determined by the nature of the original flake or blade and or the backing" (Gabel 1965:32). This view may be correct, especially in assemblages like the ones described here in which triangles (and trapezes) not only make up a meagre proportion of the tools, but in some instances the few specimens are technical rather than significant. Nelson (1973:148-157), treats all the three geometric microliths separately and argues that in spite of the believed relationship between the microburin technique and the production of geometrics, there does not appear to be any necessary correlation between the frequency of microburins and the frequency of triangles and trapezes. Perhaps this observation may explain, why as was shown in Chapter 2 there are no microburins in these assemblages while geometric microliths occurred in substantial amounts. However, since there are hardly any bladelets in the assemblages, the absence of microburins is actually what one would expect.

Crescents (Figs. 21, 22 & 23)

These are by far the commonest form of microliths and are generally the shape of a half moon, hence the name "lunate." They have a blunted convex back which in the complete specimens truncates the opposite sharp edge or the chord at each end of the arc. Blunting on the convex edge is formed by bi-directional retouch, steep retouch or a combination of these (Nelson 1973: 149). The retouch is almost perpendicular to the dorso-ventral plane and is generally heavier on the dorsal side. However, in some specimens, the retouch is less vertical and approaches the bevelling ouchtata retouch (Muto 1975:21, Fig. 12-1; Nelson 1973:149). Backing is normally heaviest at and sometimes confined to both ends of the convex back while the middle part is often lightly retouched, or as in a few specimens, left unretouched. In five specimens, the backing was exceedingly rough. Probably the flake was simply held firmly on an anvil with the edge protruding outside the edge of the anvil and hurriedly knocked off while moving the flake around so that the finished tool had a rugged back. This is a different technique from that reported by Sampson (1972:190) in the Orange River scheme.

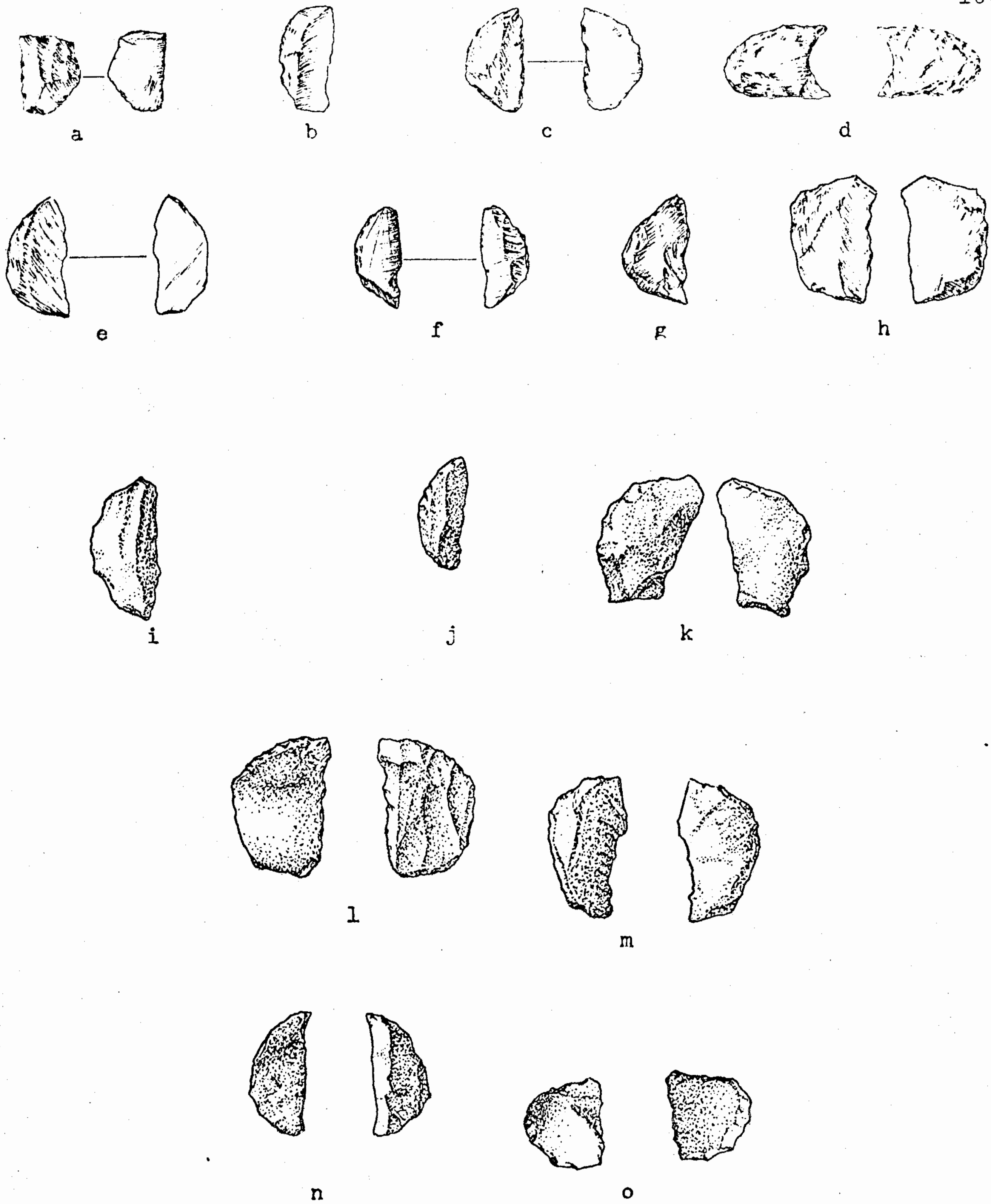
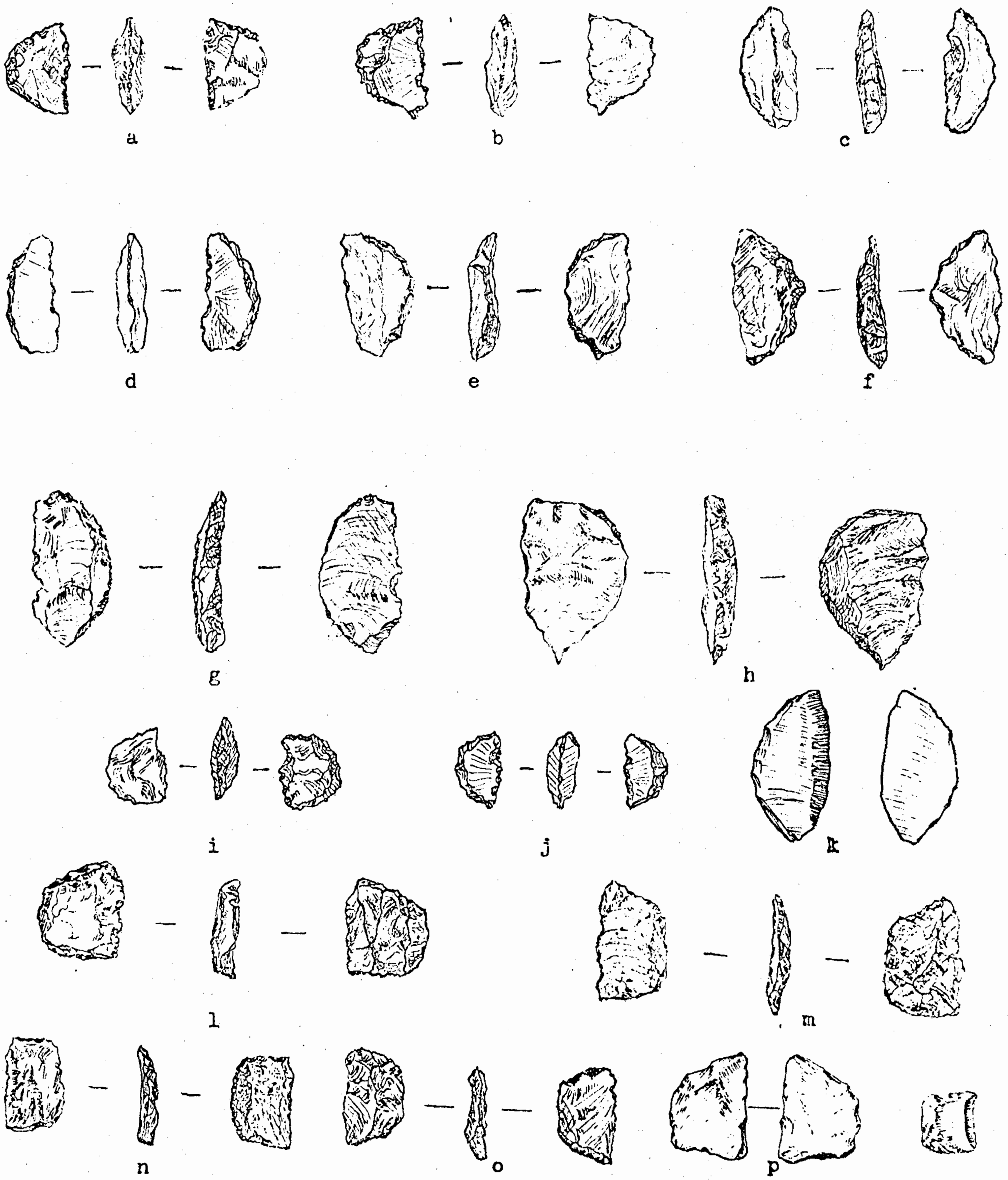


Fig. 21 Crescents from Kandaga A9 (a-k) and Majilili 2B (l-o).
Note: All artifact illustrations are natural size.



Fig, 22 Crescents from Kwa Mwango (a-h) and Kirumi Isumbirira (i-p)

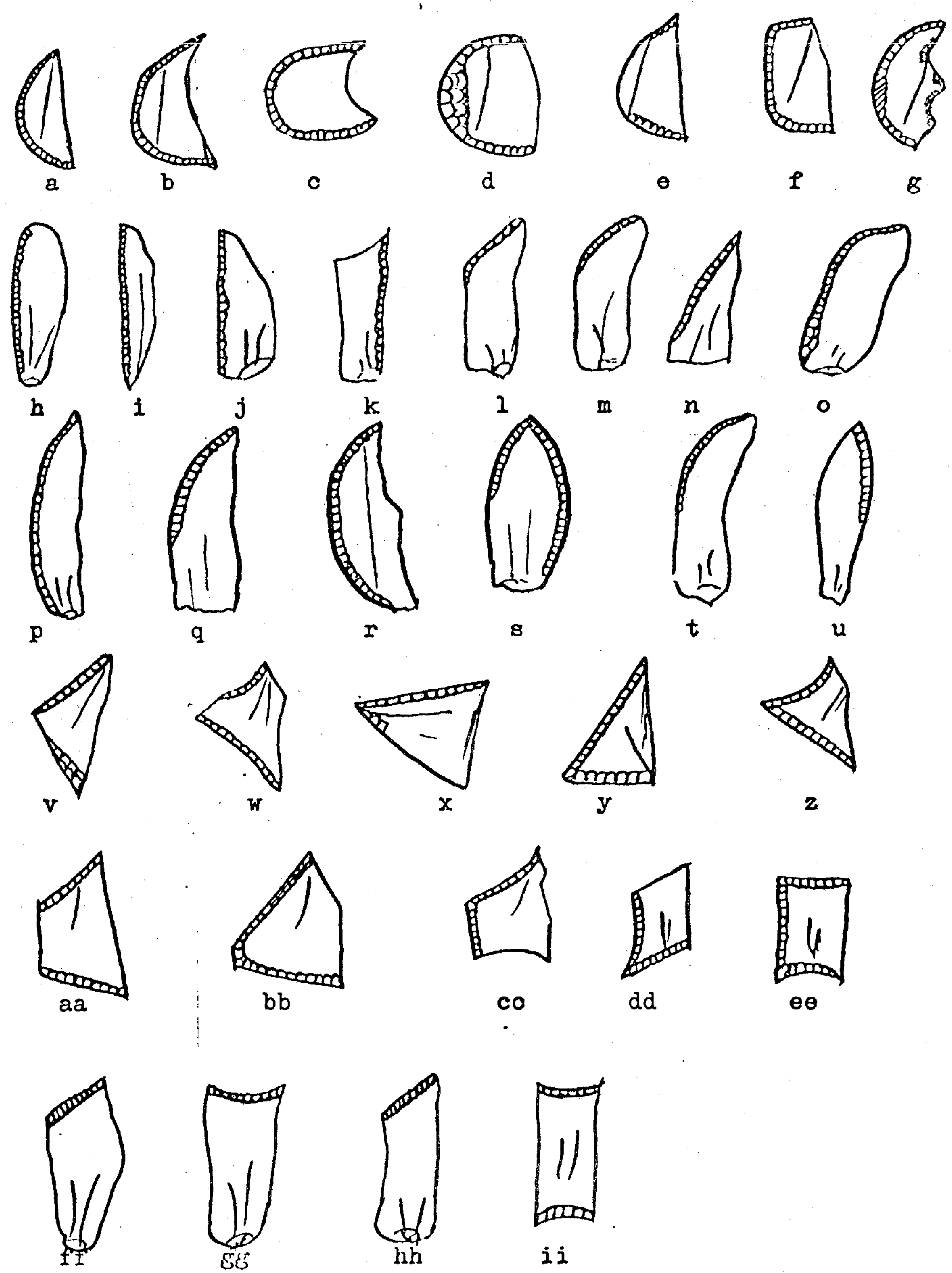


Fig. 23 · Diagrammatic illustration of common varieties of crescents (a-g), straight backed blades/flakes (h-k), obliquely backed blades/flakes (l-O), curved backed blades/flakes (p-u), triangles (v-z), trapezes (aa-ee) and truncated blades/flakes (ff-ii).

There the crescents have "one margin parallel to the long axis crushed to form a convex backed edge." Most of the crescents have a dorsal ridge or arête, an attribute also observed by M. D. Leakey (1945:7) at the Njoro River cave. Unlike those of the latter, most of the crescents in these assemblages have utilized cutting edges. The cutting edge may be straight (Fig. 23 a,e), concave (Fig. 23b,c), or rarely, convex (Fig. 23d) and in very few instances, may show notching or retouch (Fig. 23g).

The crescents are manufactured from small flakes and in some specimens part of the bulb of percussion is still present. Whereas in plane view the shape is generally a segment of circle or less than a semicircle, some specimens, as also observed by Odner (1971:189) have a wider arc and intergrade with curved backed flakes. Others are almost perfect semicircles. Nelson (1973:152) has distinguished the following types:

1) symmetrical crescents
2) asymmetical crescents
3) curved-backed flakes with reduced butt
4) curved-backed blades with continuously modified adjacent edge
5) curved-backed flakes with partially modified adjacent edge, and
6) curved-backed flakes with unmodified adjacent edge.

Overall, crescents intergrade with triangles and trapezes. The relative distribution of crescents, backed flakes, truncated flakes, trapezes and triangles combined together is shown in

(Fig. 24).

Measurements are oriented with the major axis passing through the tips. Unless otherwise stated, all measurements throughout this study are quoted in centimeters.

KANDAGA A9	sample	mean	S.D.	W/L ratio %
length	50	1.70	0.32	63
width		1.18	0.23	
thickness				
MAJILILI 2B				
length	10	2.07	0.53	73
width		1.51	0.44	
thickness		0.56	0.19	
KWA MWANGO				
length	65	1.64	0.37	64
width		1.05	0.22	
thickness		0.38	0.12	
KIRUMI ISUMBIRIRA				
length	92	1.58	0.38	61
width		0.97	0.24	
thickness		0.36	0.11	

Overall, the majority of crescents fall within the length range of 1.5 to 2 cm., with an averaged length and width of 1.75±0.17 and 1.18±0.15 cm. respectively (Figs. 25,26).

Triangles (Figs. 23, 27)

These are microlithic implements with a roughly triangular outlined formed by a single sharp edge and two blunted edges, one or both of which may be backed. The backing may be bi-directional retouch, steep retouch or a combination of these (Nelson 1973:159) and similar to that of crescents. Most of the specimens are scalene or asymmetrical while a few specimens

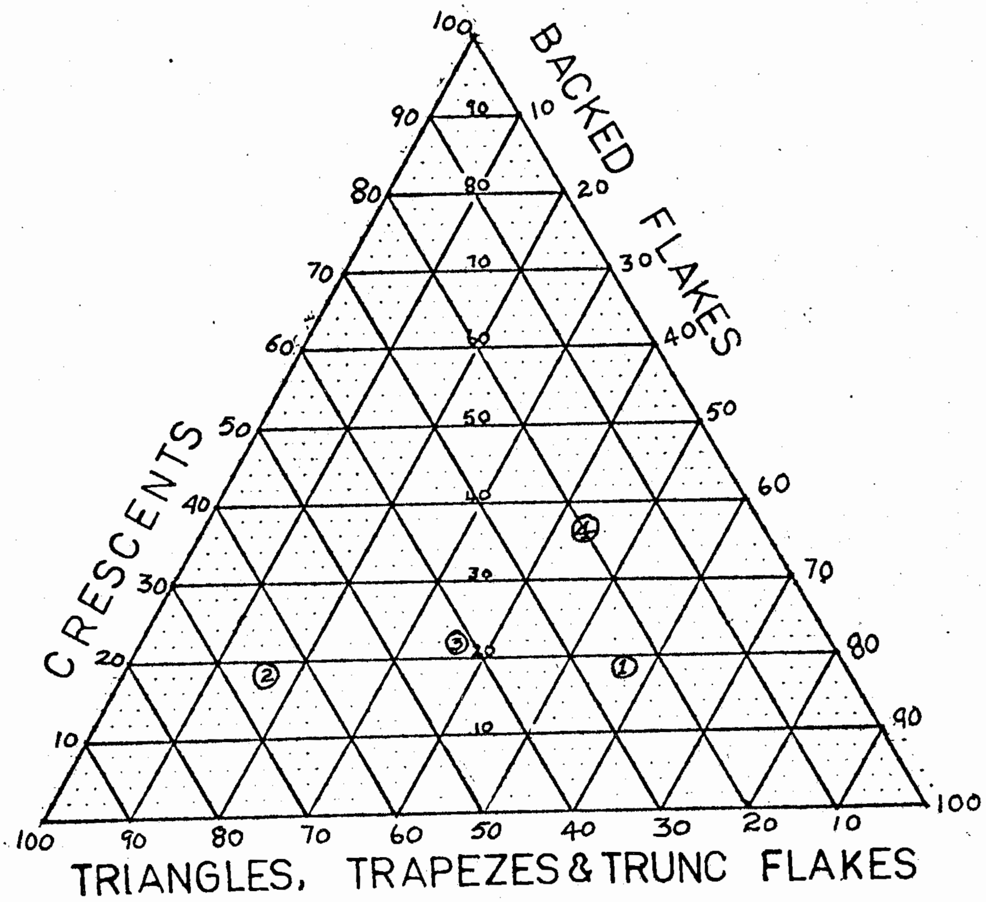


Fig. 24 A ternary diagram describing the percentage relative frequency of crescents, backed flakes and triangles, trapezes and truncated flakes in in four sites: Kandaga (1), Majilili (2), Kwa Mwango (3) and Kirumi (4). Note that sites 1,3 and 4 are more alike in the relative frequency of crescents, backed flakes and triangles, trapezes and truncated flakes. Site 2 has a slightly different composition. Triangles, trapezes and truncated flakes are coalesced because not only are they the least frequent of the geometrics, but they also intergrade with each other.

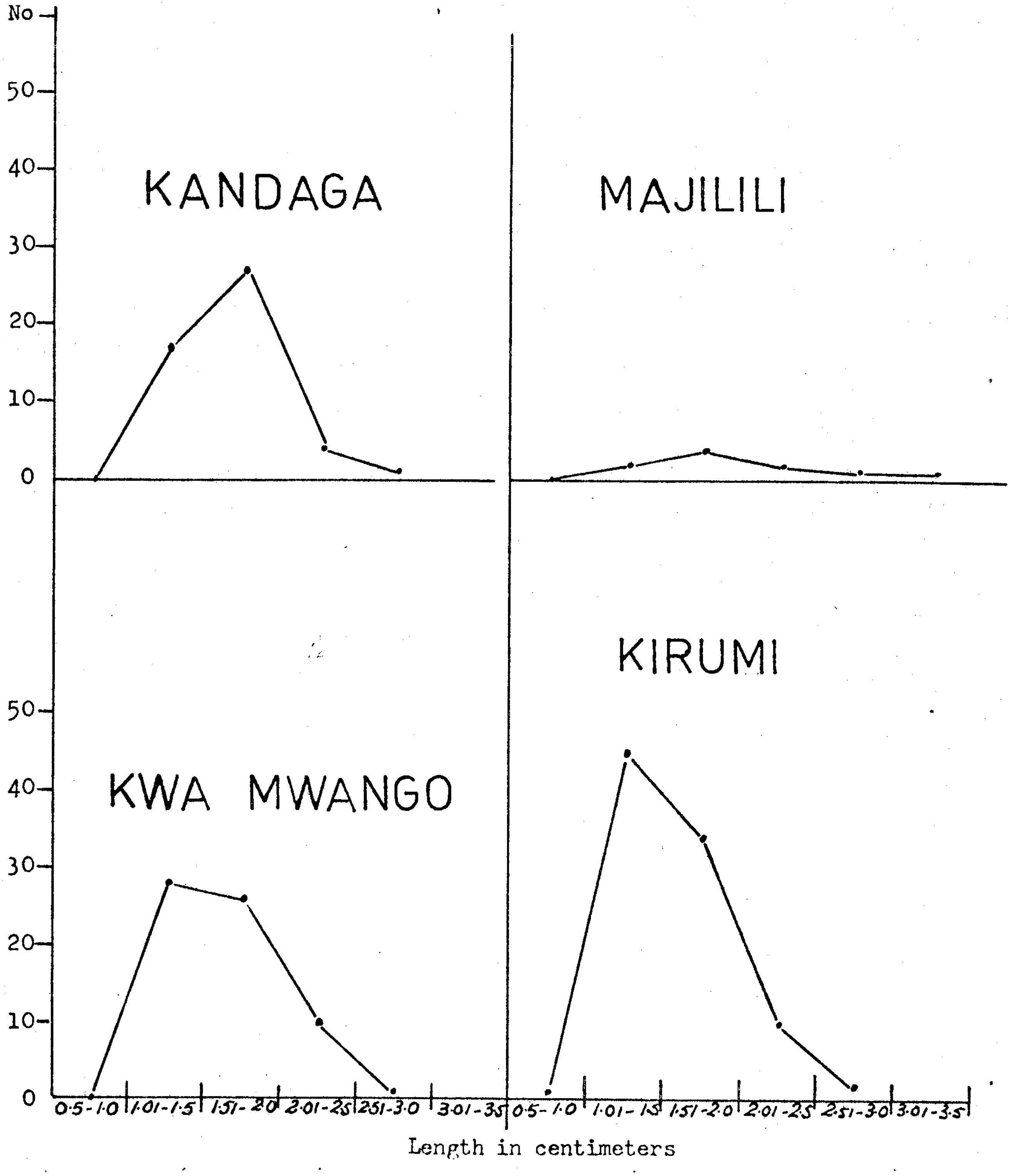


Fig. 25 Variation and distribution of crescents by length in the four assemblages.

approach an isosceles triangle. None of the other 9 categories distinguished by Tixier (1963:132-137) were recognized. In most specimens the edges are straight, but in a few, the trimmed edges display a slight concavity. The sharp edges are more or less straight or slightly convex with minute edge damage, possibly marks of utilization.

Triangles are manufactured from flakes and possibly from suitable angular waste. In some specimens, the two faces whose intersection forms the sharp edge are so alike that it is impossible to designate them as either dorsal or ventral. Some authorities, such as M. D. Leakey (1945 :283-285) and Gabel (1965:32-34), have lumped triangles together with crescents. Triangles also intergrade with trapezes and obliquely curved flakes (Nelson 1973:156).

Measurements are oriented with the longitudinal axis passing through the tip opposite the sharp edge.

KANDAGA A9	sample	mean	S.D.	W/L ratio %
length	27	1.71	0.43	0.80
width		1.36	0.40	
MAJILILI 2B				
length	17	1.71	0.34	0.75
width		1.28	0.26	
KWA MWANGO				
length	36	1.47	0.29	0.78
width		1.15	0.28	
KIRUMI ISUMBIRIRA				
length	23	1.46	0.24	0.71
width		1.03	0.20	

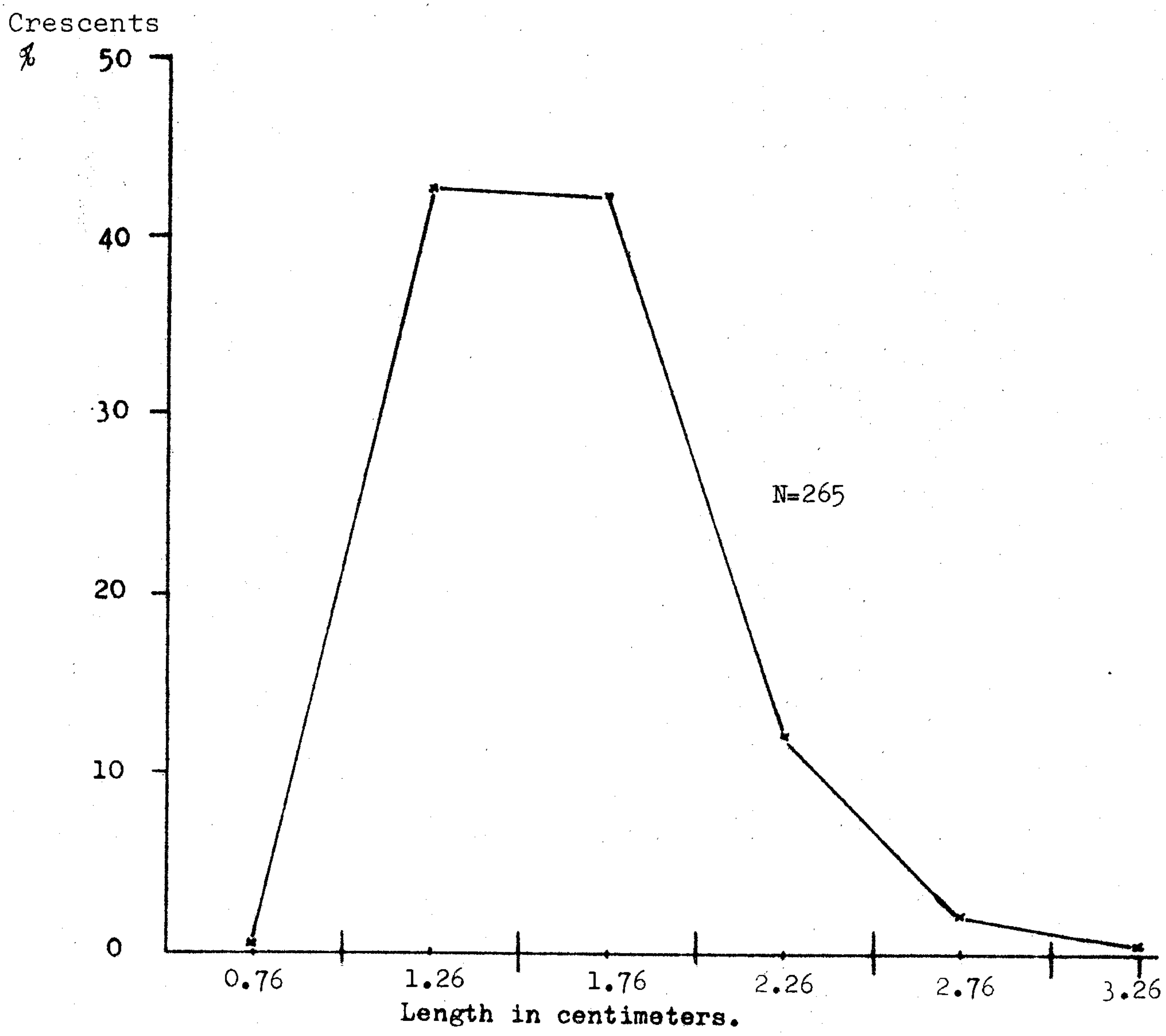


Fig. 26 Percentage distribution of crescents by length in all four assemblages added together. Note that most crescents fall between 1.01 - 2.26 cm length range. For absolute nos of crescents in each assemblage refer to tables 8,11, 14 & 18.

Overall, on the basis of length and width means, the samples may be grouped into two types; Kandaga-Majilili and Kwa Mwango-Kirumi. However when w/l ratios are computed, the grouping seems to be Kwa Mwango-Kandaga and Kirumi-Majilili: this anomaly is probably due to small sample sizes.

Trapezes (Fig. 23, 28)

A quadrilateral artifact is classified as a trapezium if it has two naturally sharp parallel edges (Fagan 1971:88). Some of the specimens have a roughly trapezoidal shape formed by at least one short edge and two edges formed by near vertical retouch. The fourth edge may be left unmodified or be casually retouched. Tixier (1963:130-132) recognizes six types of trapezes:

1) isoceles trapeze,
2) asymmetrical trapeze,
3) rectangle trapeze,
4) trapeze with one side concave,
5) trapeze with two sides concave, and
6) trapeze with one side convex.

The trapezes in the present assemblages are of the asymmetrical type, although a few may approximate the isoceles type. Most of them are a derivative of truncated flakes in that the butt has been removed by snapping the flake across, or by reducing the bulb and platform then backing the lower end (Clark 1950:104). The backing approximates that described by Tixier (1973) as invasive. The sharp edge may be straight or slightly convex

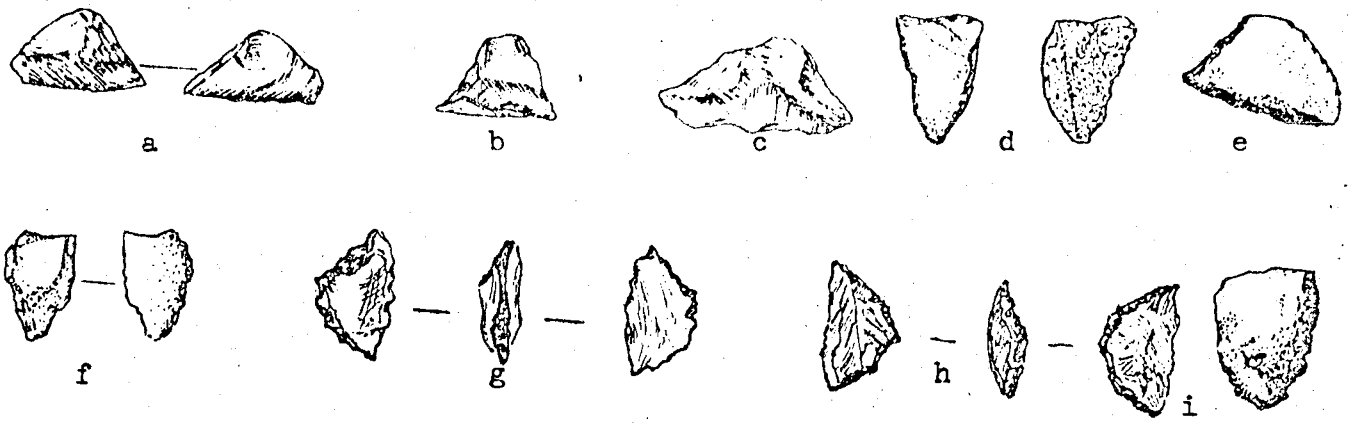


Fig. 27 Triangles from Kandaga A9 (a-b), Majilili 2B (c), Kwa Mwango (d-f) and Kirumi Isumbirira (g-i).

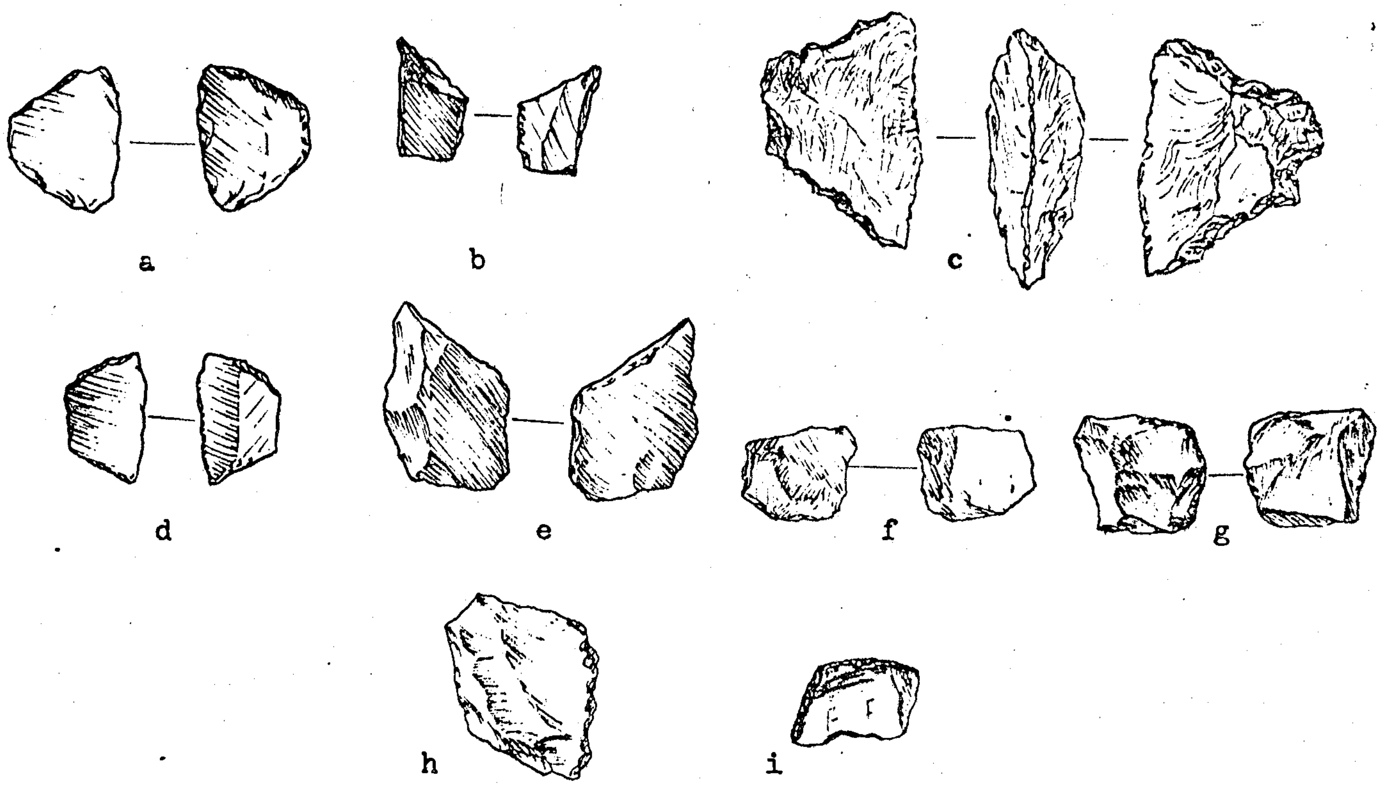


Fig. 28 Trapezes from Kandaga A9 (a-b), Majilili 2B (c), Kwa Mwango (d-f) and Kirumi Isumbirira (g-i).

and in some, it shows minor damage under the microscope.

Trapezes are intermediate between triangles and crescents (Clark 1974:126; Nelson 1973:157; M. D. Leakey 1950: Fig. 2-23). Measurements are oriented with the longest axis passing through the sharp points.

KANDAGA A9	sample	mean	S.D.	W/L ratio %
length	8	1.50	0.35	0.82
width		1.23	0.31	
MAJILILI 2B				
length	16	1.69	0.32	0.78
width		1.31	0.32	
KWA MWANGO				
length	58	1.63	0.29	0.77
width		1.26	0.28	
KIRUMI ISUMBIRIRA				
length	31	1.58	0.37	0.77
width		1.22	0.27	

Other than Kandaga A9, it is observed that in spite of the small sample sizes, the w/l ratios are very alike.

Truncated Flakes : (Fig. 23, 29)

Most of these specimens have the distal ends of the flakes and flake-bladelets truncated, probably first by snapping and then by vertical trimming or backing (Clark 1974:126; Nelson and Posnansky 1970:127). In a few specimens both ends are truncated so that the implement looks like an elongated parallelogram and would easily intergrade with the trapezes, except that the side edges are usually left sharp. The retouching at the truncated ends seems to have been directed from the ventral face of the

Fig. 29 Truncated blades from Majilili 2B (a-b), Kwa Mwango (c-f) and Kirumi Isumbirira (g-j).

flake. The truncated ends are normally straight or slightly concave. Truncation is usually oblique (Odner 1971:189; Clark 1974:126) but a few specimens have been truncated at right angles to the flake axis, thus producing implements that would approximate Tixier's rectangles (Tixier 1963:130, Fig. 47-1), but which unlike the truncated blade-flakes, have three retouched edges and one sharp edge. Nelson and Posnansky (1970: 127-130) distinguish five types of truncated blades for the Nsongezi assemblage. In a later publication however, Nelson (1973:157-169) first treats them together with curved backed blades as the two are liable to intergrade. He then distinguishes four types, viz. orthogonal, oblique, diagonal or, rarely, parallel. In the assemblages considered here, all the truncated flakes easily fall into two types; obliquely and orthogonally truncated flakes (Fig. 29) and include Tixier's types 80 and 81 (Tixier 1963:126, Fig. 4, 5, 7) except that those in the present assemblages do not show signs of basal retouch. The categories of Nelson's typology which is, in turn, based on Leakey's have been followed here since there is not as yet a generally accepted typological system for the geometric microliths in sub-Saharan Africa (Nelson 1973: 158). Truncated flakes are the least frequent microliths in the four assemblages described here.

Measurements are oriented to the flake axis.

KANDAGA A9	sample	mean	S.D.	W/L ratio %
length	32	1.51	0.46	0.91
width		1.37	0.35	

KWA MWANGO	sample	mean	S.D.	W/L ratio %
length	24	1.42	0.38	0.82
width		1.17	0.17	
KIRUMI ISUMBIRIRA				
length	6	1.32	0.27	0.83
width		1.09	0.40	

Backed Flakes : (Fig. 23, 30, 31).

It is generally agreed that a flake whose length is twice or more than twice its width should be called a blade. Most authors distinguish between true blades and flake blades. Besides the size criterion, only the true blades have the traces of previous parallel removals and more or less parallel edges (Bordes 1961:6). As previously pointed out, Tixier's classification of blades (Tixier 1963:157) is not suitable for the present analysis. "Flakes' should be substituted for "blades (Nelson 1973:164; Sampson and Sampson 1968:8; Odner 1972:45). Others (L. S. B. Leakey 1931:95-96; M. D. Leakey 1945:286; Gabel 1965: 34; Robbins 1967, 1968; Miller 1969:514-515; Nelson and Posnansky 1970:130-131; Odner 1971:189; and Gramly 1975:18-19) have used the terms backed blade, Chatelperron type, non crescentic-backed blade, backed flakes or blades, on backed microblades, to describe a class of microliths more or less similar to those described below.

These are whole or broken flakes whose one edge has been backed by direct retouch, while the other is left unmodified. They do not conform to one uniform outline and the retouch, which in most specimens is directed from the dorsal side,

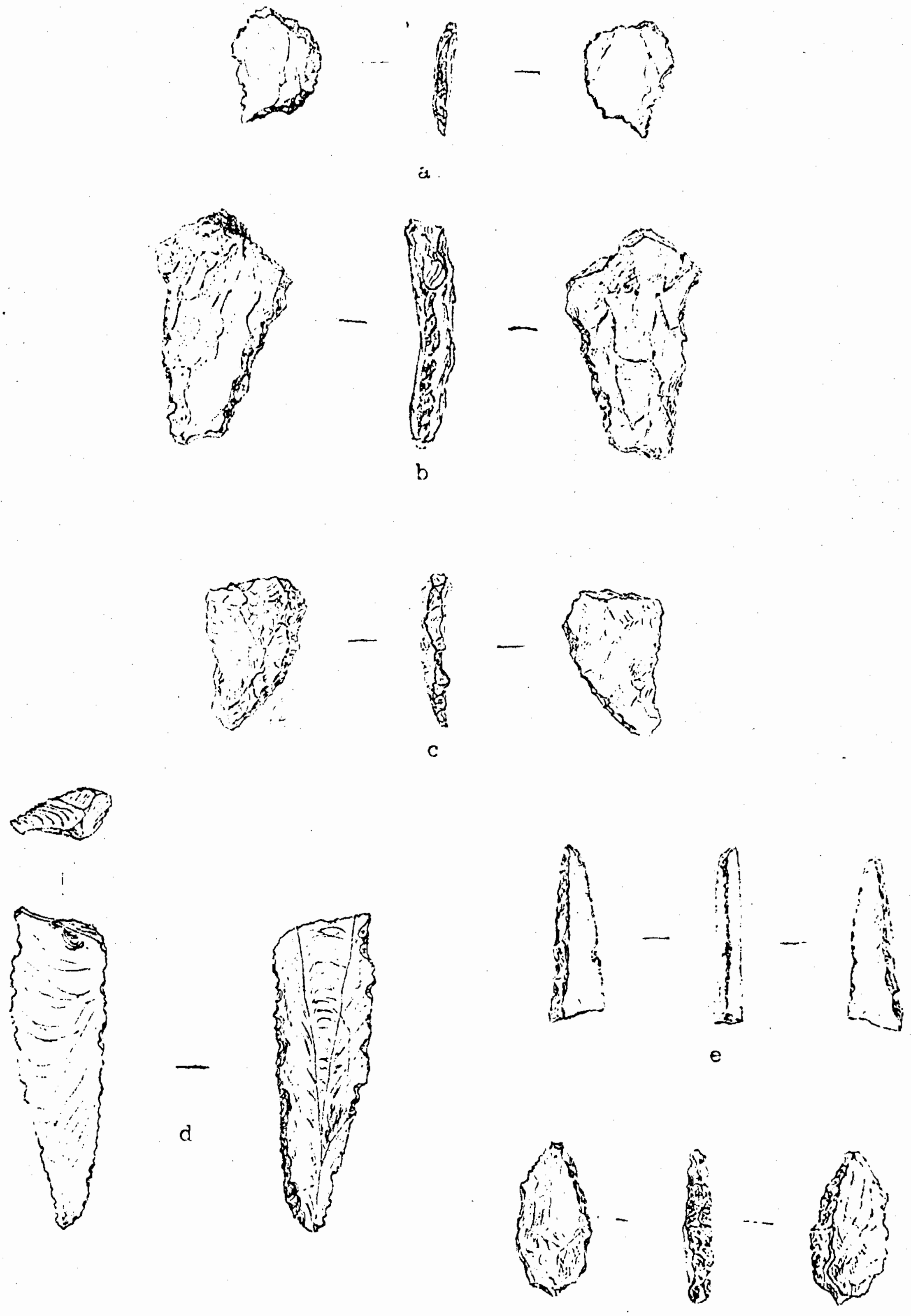


Fig. 30 Straight backed flakes from Kandaga A9 (a-c), Kwa Mwango (d) and Kirumi Isumbirira (e-f).

Fig. 31 Curved backed flakes (a-l), from Kandaga A9 (a-b), Majilili 2B (c-d), Kwa Mwango(e-h) and Kirumi Isumbirira (i-l). Obliquely backed flakes (m-s) from Kandaga A9 (m-n), Kwa Mwango (o-p) and Kirumi Isumbirira(q-s).

varies from near-vertical to shallow. In some specimens, the retouch covers all the edge but in others it is restricted to some portion, usually near the tips. The latter are sometimes obliquely truncated by invasive or ouchtata retouch.

They have been classified into straight-backed flakes, obliquely-backed and curved-backed flakes (Figs.23,30,31). In the first class, the retouched edge is fairly straight, although the opposite edge may show some slight concavity. In the curved type, the edge is usually convex, but the curvature does not approach that of crescents. Technically, the backing is similar to that observed in the crescents. At one end, the retouched edge may intersect the margin of the flake, thus forming a sharp point. At the other end, it may intergrade with the opposite flake margin or intersect the striking platform or the proximal margin of the flake. Sometimes the retouched edge may curve backwards truncating the sharp edge, thus intergrading with crescents. However, the residual bulb of percussion always distinguishes the specimen from crescents. In yet other specimens, the retouchededges may proximally, distally or both, truncate the opposite sharp edge in such a way that the specimen would intergrade with truncated flakes or trapezes were it not for the curved-backed edges portion (Nelson and Posnansky 1970:128-29). Overall, the straight-backed class is rare, as is also probably the case in other sites in eastern and southern Africa (Clark 1974:126). Some of the specimens resemble Tixier's types 45(1 & 3), 47 (15); 52 (7 & 8) and 56 (8) (Tixier 1963:

96-105; Fig. 34, 35, 36).

Backed flakes are by far the most frequent microlithic tool type in the four assemblages. It is conceivable that some of the specimens represent intermediate stages towards complete microliths of a different type, particularly crescents. In an attempt to find out the degree of association between length and width, a product-moment correlation coefficient of 0.018 was obtained for one of the samples. On the basis of this statistic there is hardly any association. The scatter diagram (Fig. 32), seems to confirm this suspicion. It also shows that most of these implements are backed flakes rather than backed flake-blades.

Measurements are oriented to the flake axis.

KANDAGA A9	sample	mean	S.D.	W/L ratio %
length	136	1.77	0.38	63
width		1.11	0.29	
MAJILILI 2B				
length	9	2.66	0.72	55
width		1.46	0.44	
KWA MWANGO				
length	90	2.04	0.46	55
width		1.12	0.34	
KIRUMI ISUMBIRIRA				
length	115	1.87	0.38	56
width		1.04	0.28	

Casually Retouched Flakes (Fig. 33)

In outline, some of these are very similar to backed blades, but unlike them, one or both edges are retouched by

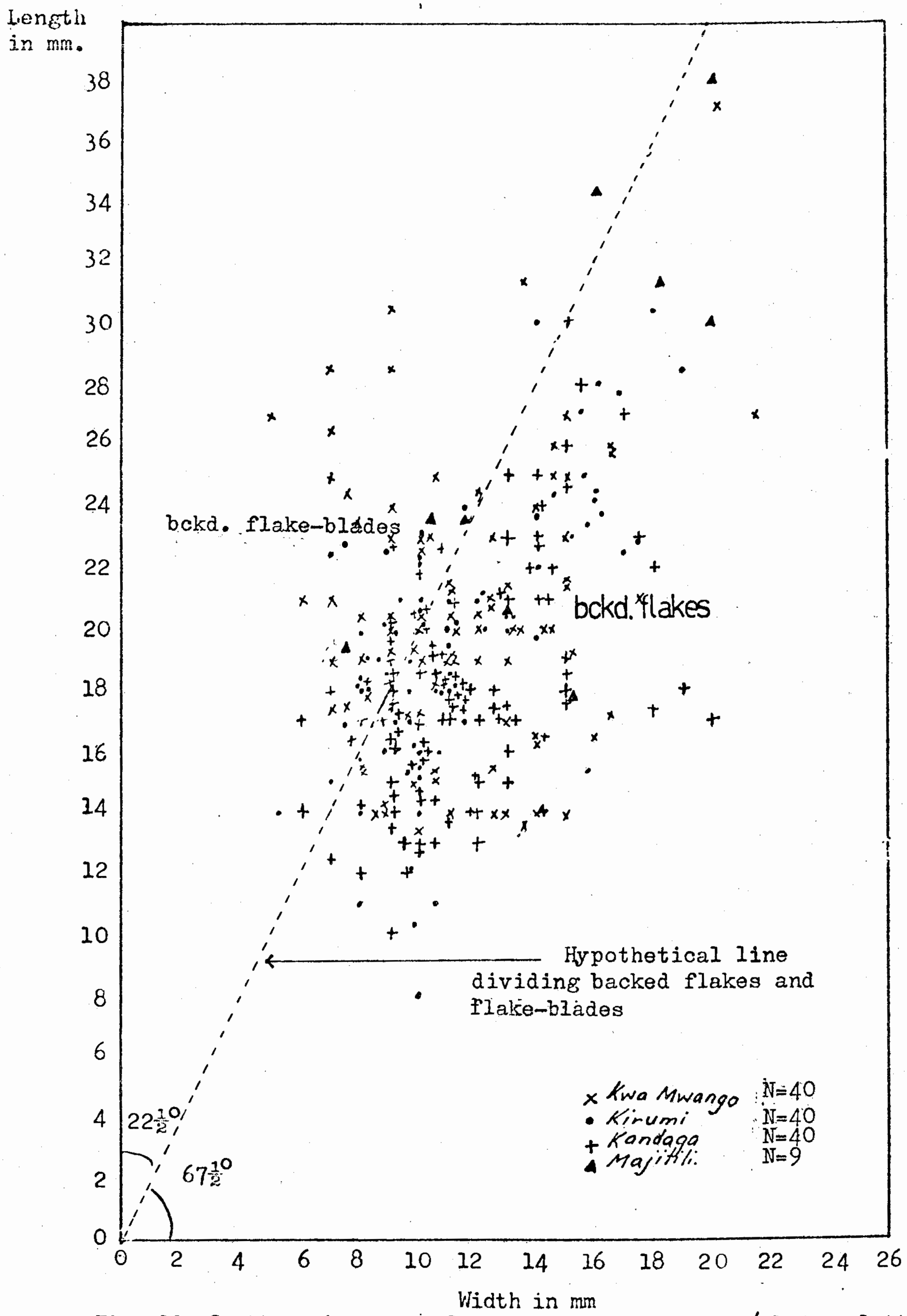


Fig. 32 Scatter diagram of lengths of backed flakes/blades plotted against widths. Note that there are very few flake blades.

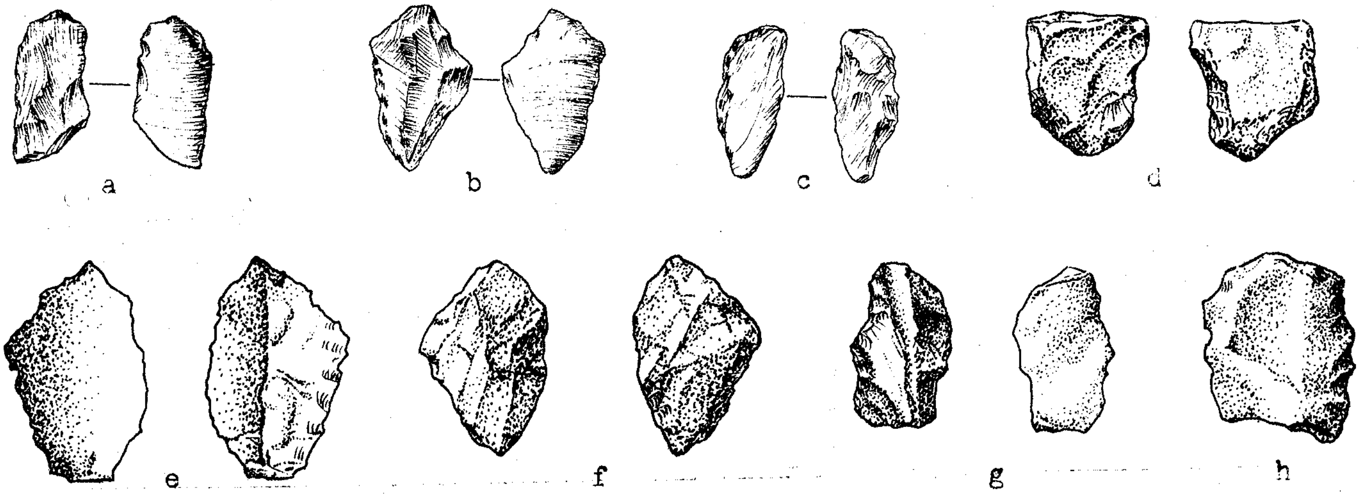


Fig. 33 Casually retouched flakes from Kandaga A9 (a-c), Majilili 2B (d), Kwa Mwango (e-f) and Kirumi Isumbirira (g-h)

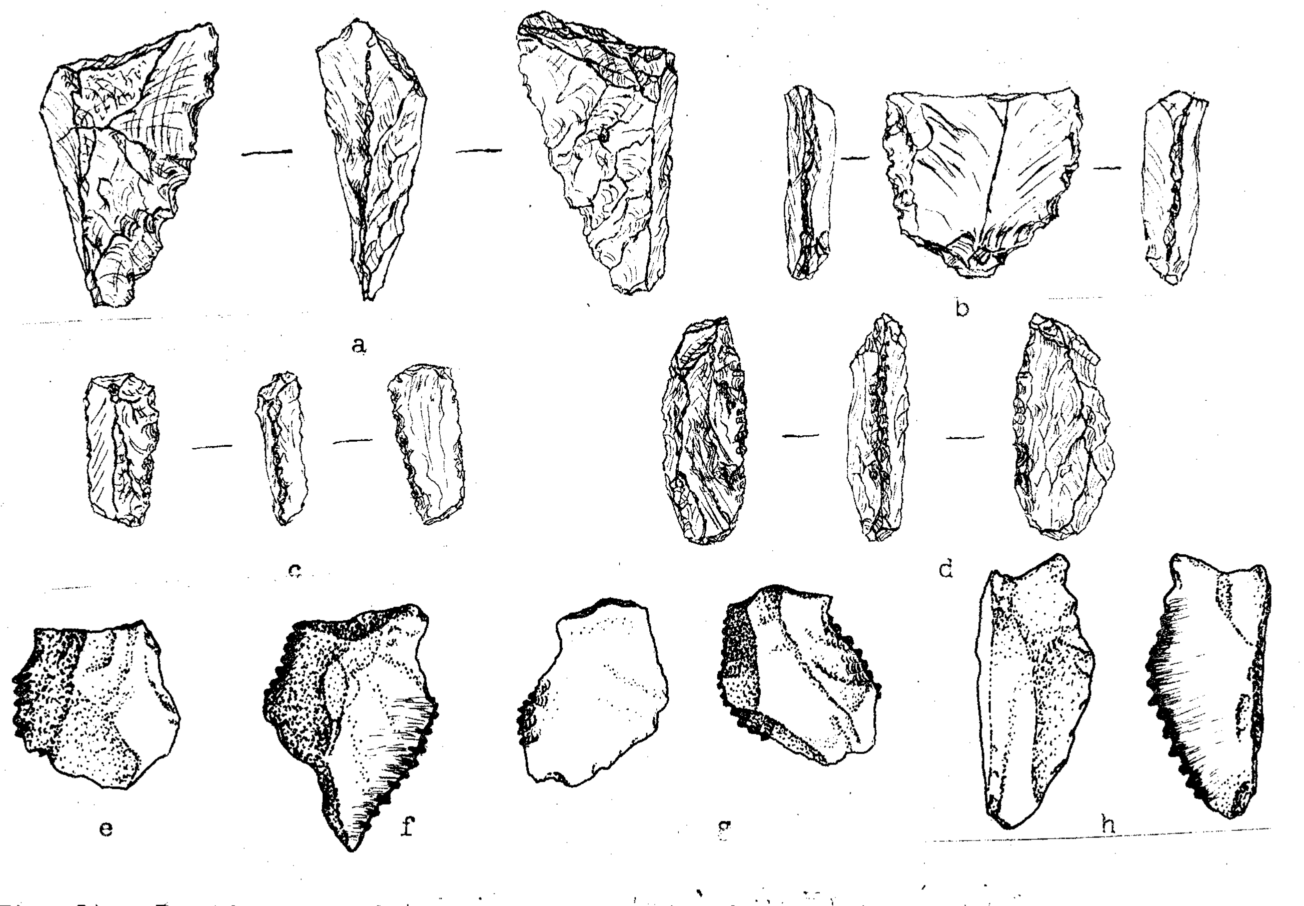


Fig. 34. Denticulates from Majilili 2B (a-b), Kwa Mwango (c-d) and Kirumi Isumbirira (e-h).

striking off small flakes. The retouching is mostly inverse and unifacial but it may also be normal or alternate. Seldom is the whole edge retouched; rather, the retouch is sporadic or concentrated towards the extremities and as such could easily intergrade with scrapers, though the retouch is usually less bold. When the retouch is spread sporadically along the edge, they easily intergrade with denticulates. In most specimens the modified edge is dulled or irregularly scarred, presumably from utilization (Nelson and Posnansky 1970:151). The majority of the specimens are whole flakes but a few are fragments. The latter would intergrade with retouched waste, but in most cases there are sufficient residual flake attributes such as percussion bulb and flake release to classify them as casually retouched flakes. Other authors have not allowed a separate class for these specimens. Nelson (1973:1969:171) seems to include these under backed blades, while Sampson's categories "trimmed utilized flakes" and "trimmed utilized blades" (Sampson 1972:185) would include some of the specimens in this category. Fagan (1971:91-6) considers this class under retouched flakes but due to the sporadic nature of the retouch a distinction must be made from ordinary retouched flakes. As previously remarked, the typological system for the Late Stone Age in sub-Saharan Africa is still in the formative stage. The lack of a precedent class to cover the tool category described here is not due to failure of their recognition by prehistorians, but rather partly due to the fact that casually retouched flakes have not been recovered in large enough quantities to create a separate category and partly due to already existing indiscriminate miscellaneous categories such as utilized flakes and flake fragments (Clark 1974:127), utilized blades (Clark 1950:105), composite tools (Odner 1971:191), regeneration flakes (M. D. and L. S. B. Leakey 1950:7) and retouched flakes (Fagan 1971:91), into which the tool types described here may have been included. The present author considers the tool types frequent and distinct enough, especially among the four assemblages described in this thesis, to warrant the creation of a single tool type category.

On plotting the w/l ratio against the number of tools (Fig. 35) it is clear that no distinctive pattern of distribution is displayed between the three sites. However, in all cases most of the specimens fall within the w/l ratio range of 45-85% with high peaks at 60-70%. Perhaps this represents preference for special types of flakes for the manufacture of casually retouched flakes. In Figure 36, all the casually retouched flakes are compared with denticulates and again it is clear most of the specimens fall within the w/l ratio range of 45-75% while the denticulates show a slight bimodal distribution with peaks at w/l ratios of 50-55% and 70-75%.

Measurements are oriented with the long axis passing through the striking platform.

KANDAGA A9	sample	mean	S.D.	L/W ratio%
length	76	1.68	0.40	67
width		1.13	0.30	

KWA MWANGO	sample	mean	S.D.	W/L ratio %
length	58	2.12	0.50	63
width		1.33	0.46	
KIRUMI ISUMBIRIRA				
length	80	2.11	0.61	67
width		1.42	0.45	

Denticulates (Fig. 34)

Denticulates are basically flakes one of whose edges is serrated, but may also be made from cores (Carlson 1966:60). Fagan (1971:85) describes denticulate flakes as having three or more notches occurring close to each other. Those described here are deeply nibbed rather than notched, resulting in a continuous short irregular retouch on one or two edges. Denticulates have been recognized in East African Late Stone Age industries by Odner (1972:46), but like the casually retouched flakes with which they intergrade, they have been lumped together with miscellaneous or nondescript categories. As a class, they are less frequent than casually retouched flakes, although higher frequencies are reported from Libyan Later Stone Age industries such as the Oasis C group (Hobler and Hester 1969:125), Khormusan and Gemaian (Wendorf 1968:1045-46). Two of the sites studied had a few specimens of denticulates; the other two lacked them. The small sample of denticulates shows that two w/l ratio ranges (50-55% and 70-75%) were probably selected for choosing flakes to modify into denticulates (Fig. 36).

Measurements are oriented with the long axis passing through the flake axis.

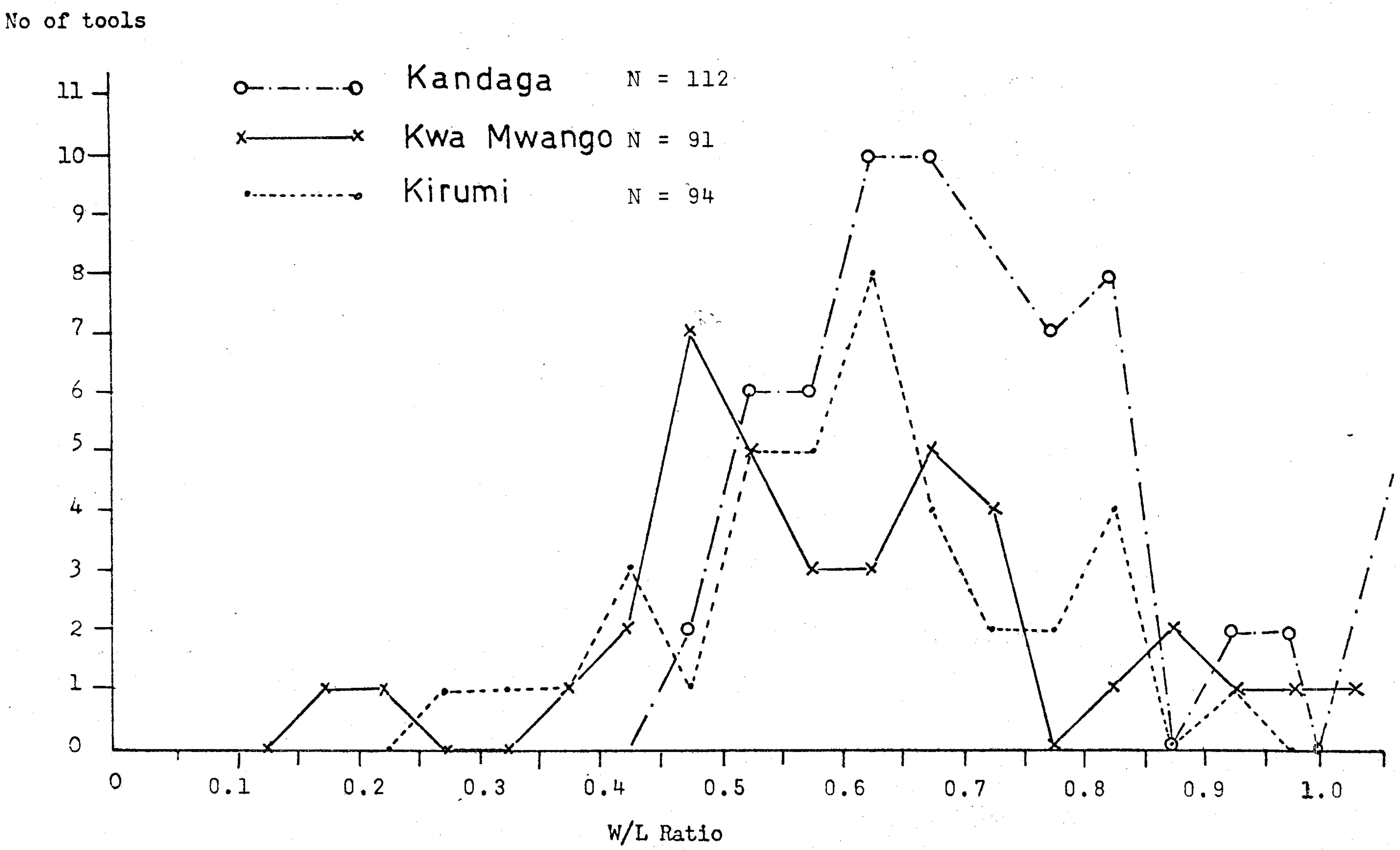


Fig. 35 Distribution of casually retouched flakes by w/l ratios from three assemblages. For absolute frequencies refer to tables 8, 11, 14 and 18.

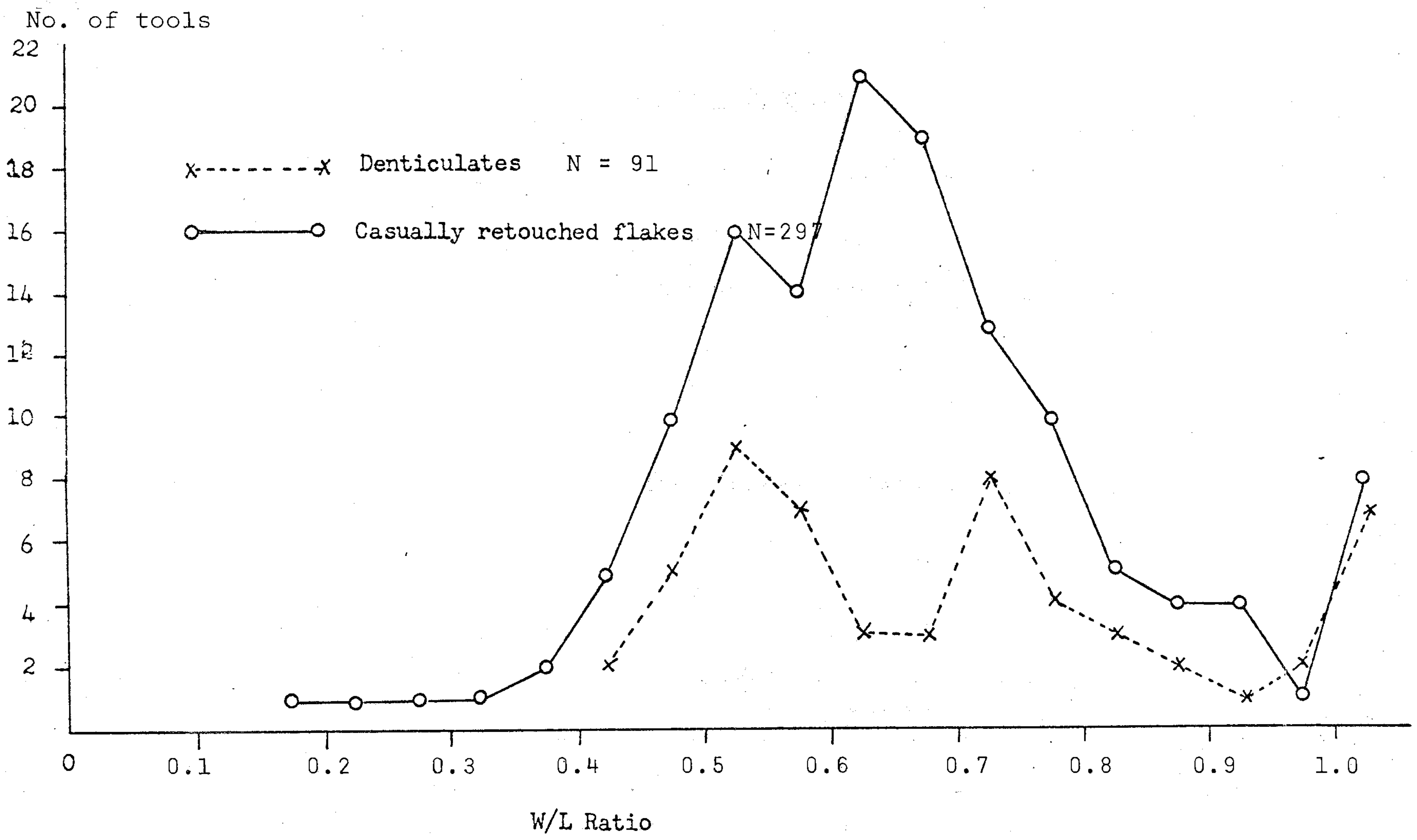


Fig. 36 Distribution of casually retouched flakes and denticulates by w/l ratio in all assemblages lumped together. For absolute frequencies refer to tables 8, 11, 14 & 18.

KWA MWANGO	sample	mean	S.D.	W/L ratio %
length	44	1.98	0.50	83
width		1.46	0.47	
KIRUMI ISUMBIRIRA				
length	19	1.77	0.31	70
width		1.24	0.29	

Scrapers (Figs. 37-41)

The six classes of scrapers, when lumped together, form the most predominant class of shaped tools not only in the four assemblages considered here but also in the Late Stone Age industries in East Africa (Nelson 1973:17; Odner 1972:34, Table 1; Gramly 1975:20, Table 24).

Large frequencies of scrapers are also reported from some southern African sites (Inskeep 1967:575-8; Gabel 1965:42, Table 1; Clark 1974:123, Table 13; Deacon 1970:16-17).

Scrapers are characterized chiefly by unifacial plano-clinal edges (Nelson 1973:175). The identification of scrapers in East African Late Stone Age industries poses problems of intergradation with unshaped tools such as casually retouched flakes, angular retouched waste and cores. The most comprehensive treatment of the intergradation of scrapers with other tools and artifacts is that by C. Nelson (1973:175-205). According to him, the intergradation may be analysed in two continua; one extending from casually retouched debris (probably equivalent to casually retouched flakes and retouched angular waste in the context of this report) through the intermediate grades of modification to artifacts whose edges have been backed by

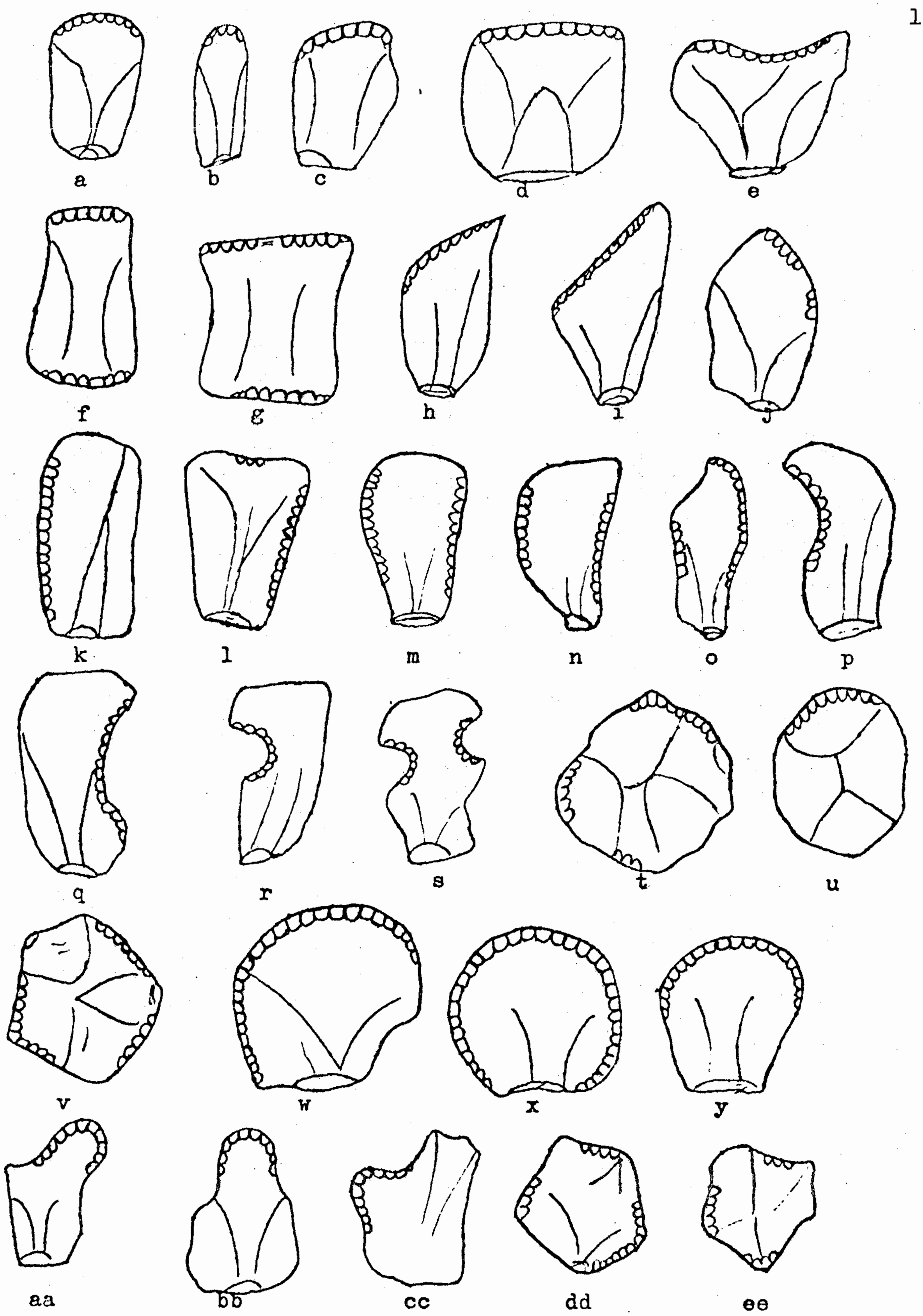


Fig. 37 Diagrammatic illustration of common varieties of simple-end scrapers (a-c), transverse end scrapers (d-e), double end scrapers (f-g), oblique end scrapers (h-j), single side scrapers (k-l), double side scrapers(m-o), concave side scrapers(p-q), notched side scrapers(r-s) core scrapers (t-v), Convex scrapers (w-y), nosed scrapers (aa-cc) and irregular scrapers (dd-ee).

bidirectional (direct and inverse) retouch, and the other extending from casually retouched debris through the normal and nucleoform scrapers to the flakes and blade cores. The intergradation either way is gradual and complex and because of this it may escape the notice of the researcher. However, the continuum is liable to show minor differences from one assemblage to another, although it may safely be said that all Late Stone Age assemblages in East Africa contain several specimens within the continua. It is, for instance, observed that there is more intergradation between scrapers and retouched artifacts in the assemblages from Kandaga A9 and Majilili 2B than there is in the assemblages from Kwa Mwango and Kirumi Isumbirira.

Inherent in the intergrading complexity is the problem of creating types within the category and in many cases, such subdivision of the continua is arbitrary (Nelson 1973:176). In awareness of this problem and in trying to avoid the risk of duplicity, the present study has adopted a new point of departure by creating only six types as opposed to Nelson's 19 types and Tixier's 11 types (Nelson 1973:182-205; Tixier 1963:54-63), but most of their types are subsumed in the six types described here (Figs. 37-41).

On the whole, scrapers were recognized from other retouched artifacts on the basis of type of modification and overall size. Objects whose edge modification was as a result of inverse retouch, and which were thought to be intermediate between shallow and approaching near perpendicular retouch were first scored as possible scrapers. Thus on the basis of this, specimens were scored either as backed flakes or side scrapers. Needless to say, the division is rather arbitrary and it is conceivable that another analyst might score more of either from the same assemblages. On the point of size and especially where the retouch could either delineate a backed flake or a side scraper, it was arbitrarily decided that if the width of the specimen was less than 1.0 cm. it was scored as a backed flake, casually retouched flake or retouched waste, as the case may be.

Other types of scrapers such as end scrapers, core scrapers, or convex scrapers, did not present as many problems although core scrapers are liable to overlap with cores in a number of cases. Here the separating criterion was the edge modification which, when present in non-scraper cores, was observed to be irregular and rather abrupt or abrasive, i.e. where the removals start from both surfaces of the piece and form a back (Muto 1974: 21). On the contrary, the retouching on core scrapers was thought to be more regular and unidirectional. Overlapping of scrapers and cores has been reported from Magosi II, Nyero Rock Shelter, Kantysore Island, Nsongezi Rock Shelter assemblages (Nelson 1973:179) and at Narosura where some of the cores have been re-utilized as scrapers (Odner 1972:42).

The division of the scraper category into several types is morphological and relies on such attributes as overall outline, cross section, the shape of the worked edge and its relationship to the outline of the whole tool. Where for instance, a flake had a scraping edge on the side parallel to the flake margin as well as on one of the ends, it was scored first as an end scraper or a side scraper, depending upon which edge the retouching was more extensive. Clark (1974:126) seems to lump all end and side scrapers into one single category, "flake scrapers", while Gabel (1965:35) uses the term "blade scrapers" to refer to both. Fagan (1971:82-83), on the other hand groups end and side scrapers, double side scrapers and double end scrapers under the heading "double flake scraper". The distinction is not as simple as it appears. Combination end and side scrapers have been recognized as a distinct type by Tixier (1963:54-63). The following types of scrapers were recognized.

<u>End Scrapers</u> (Figs. 37, 38; Table 25)

Any scraper whose major scraping edge truncates the distal end, proximal end or both ends of a flake was scored as an end scraper. In many specimens, the retouched edge shows a slight camber. For the purpose of distinction between end and convex scrapers the criterion is whether the edge approximates a segment of a circle, and if it doesn't then it is not considered part of a continuous arc, hence not a convex scraper (Nelson 1973:184). The scraping edge is as a rule backed by inverse retouch but instances of bidirectional retouch and alternate inverse and direct retouch were also observed. The range of attributes within this category is so diverse that it is considered necessary to divide them into sub-categories. The latter were not scored as a type in the overall analysis

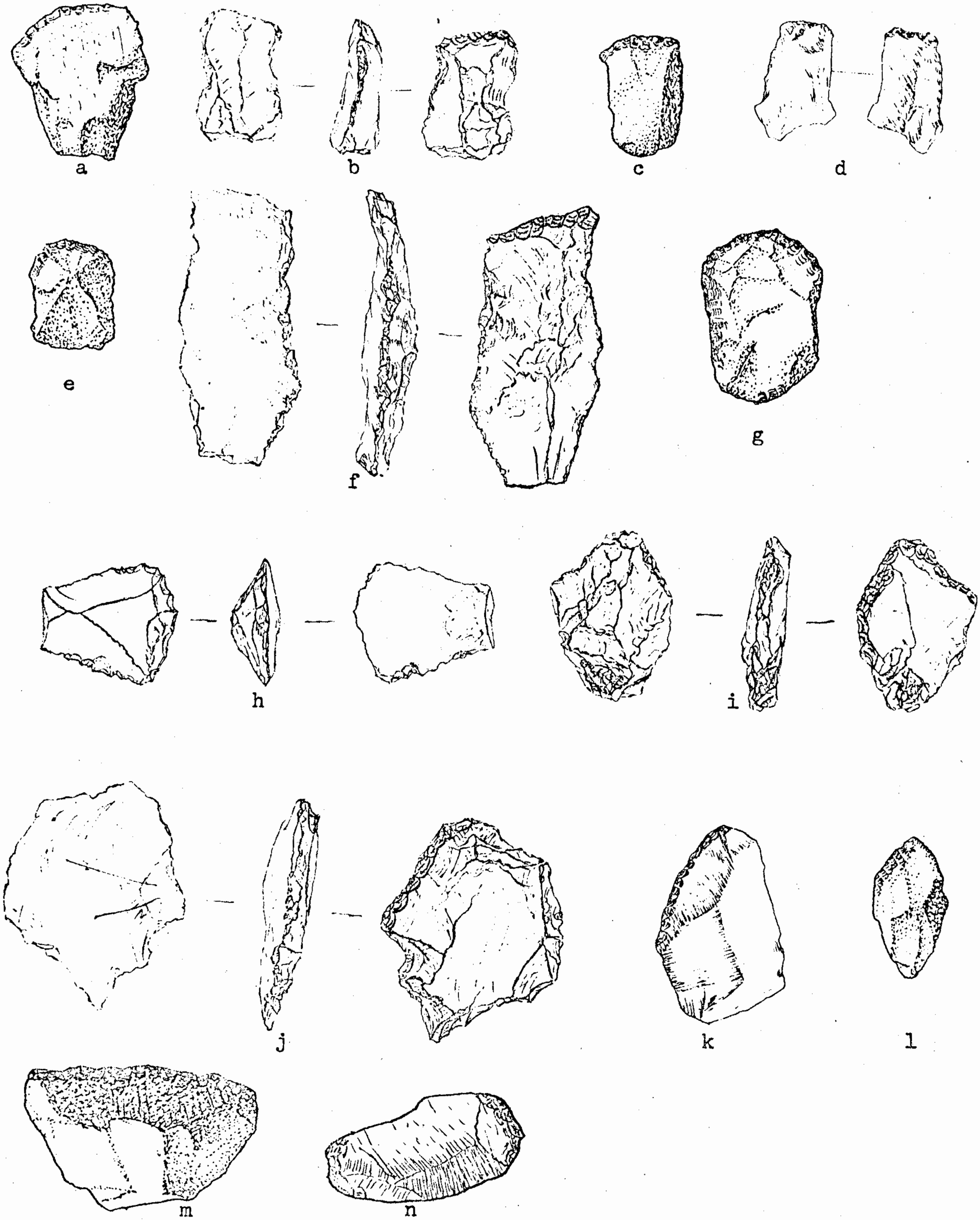


Fig. 38 End scrapers; simple end scrapers a-e, side end scrapers f-h, oblique end scrapers i-l, transverse end scrapers m, and double end scraper n.

i. Simple end scrapers (Figs. 37a, 38a-e)

These are scrapers whose scraping edge covers part or the whole of the distal or proximal end of the flake. The edge may show slight convexity or may be left more or less straight. As a rule, they are fairly flat and thin, although the dorsal face may show a few negative flake scars. They intergrade with convex scrapers and oblique end scrapers but the edge modification is almost symmetrical while in the oblique end scraper the modification is more extensive on one side of the flake axis. The tradition in East Africa and in some parts of southern Africa has been to lump simple end scrapers together with all the other varieties of end scrapers (Gabel 1969:224-229; Leakey and Leakey 1950:7; Miller 1969:517-519; Odner 1972:42), but Nelson (1973:186-189) makes a distinction between several types of end scrapers. The simple end scrapers described here are equivalent to Tixier's 1963: Fig. 12-1, 2 & 5; 13-1:14-4).

ii. Transverse end scrapers (Figs. 37d,e, 38m)

The only distinction between these and simple end scrapers lies in the type of flake. Unlike the simple end scrapers, these are made from side-struck flakes so that they are wider than they are long. As such, they have a more extensive modified edge. Although in all the specimens identified, it is conceivable that like the simple end scrapers, the butt end may also be modified. At any rate, there seems to be a preference for the distal end in all end scraper types. This type is subsumed under Nelson's simple end scraper (Nelson 1973: Fig.

III-i,j,k) and Tixier's (1973: Fig. 12-6).

iii. Double end scraper (Figs. 37f, g, 38m)

This type is characterized by a double truncation on both the distal and proximal ends. The retouch at both ends is usually inverse but in some specimens the retouch is alternate, i.e. inverse at one end, and direct at the other. They may be transverse double ended or simple double ended. Like the transverse, and the simple ended they had until Nelson's studies, been lumped together under end scrapers in East Africa (Nelson 1973:189-190). They are partially equivalent to Tixier's (1973: Fig. 16-2, 3, 4).

iv. Oblique end scrapers (Figs. 37h-j, 38i-e)

In outline they are like simple end scrapers, the only exception being the positioning of the retouched edge with respect to the flake axis. Instead of the modified edge being directly opposite the flake axis, it is skewed to the side so that a portion of the flake's distal side and end form the scraping edge. Although no examples of double ended oblique scrapers were recognized in the assemblages, it is quite conceivable that such types could exist. Many authorities have not recognized these as a type but due to their abundance in East African sites (Nelson 1973:191) they are considered a distinct subtype within the end scraper category. They have a tendency to intergrade with simple end scrapers. The specimens from Kandaga A9, Majilili 2B, Kirumi Isumbirira and Kwa Mwango are equivalent to Nelson's (1973: Fig. III-25; y, z) and Tixier's (1963: Fig. 12-3).

Nelson (1973) has identified other types of end scrapers including triangular, carinated, nucleoform and miscellaneous scrapers, but these have not been identified in the present study.

Measurements are oriented to the flake axis.

All end scrapers

KANDAGA A9	sample	mean	S.D.	W/L %
length	58	2.17	0.67	88
width		1.92	0.76	
MAJILILI 2B				
length	22	2.55	0.84	99
width		2.52	0.88	
KWA MWANGO				
length	32	2.26	0.61	92
width		2.09	0.86	
KIRUMI ISUMBIRIRA				
length	26	2.71	0.98	98.5
width		2.68	0.93	

The mean length and width show that flakes chosen for the manufacture of end scrapers are at least 2.0 cm. in length and width. Unlike side scrapers, the w/l ratios are very close to one, indicating that preference was given to flakes which are almost as wide as they are long. Such flakes would be side struck as opposed to end struck flakes in which the length is appreciably greater than the width.

Table 24 : A breakdown of the main categories of scrapers in the four assemblages.

	Kandaga A9	Majilili 2B	Kwa Mwango	Kirumi Isumbirira	Total	%
End Scrapers	78	28	33	26	165	17.13
Side Scrapers	174	80	93	110	457	47.46
Core Scrapers	91	33	50	43	217	22.53
Convex Scrapers	14	4	23	10	51	5.30
Nosed Scrapers	2	5	8	4	19	1.97
Irregular Scrapers	-	-	38	16	54	5.61
Total	359	150	245	209	963	100

Table 25 : A breakdown of End Scrapers

	Simple	Transverse	Double	Oblique	Total
Kandaga A9	41	16	10	11	78
Majilili 2B	14	8	2	4	28
Kwa Mwango	17	10	5	1	33
Kirumi Isumbirira	14	5	3	4	26
Total	86 (52.12%)	39 (23.64%)	20 (12.12%)	20 (12.12%)	165 (100.00)

Table 26 : A breakdown of Side Scrapers

	Single	Double	Concave	Notched	Total
Kandaga A9	122	26	18	8	174
Majilili 2B	63	8	7	2	80
Kwa Mwango	70	8	11	4	93
Kirumi Isumbirira	81	10	12	7	110
Total	336 (73.52%)	52 (11.38%)	48 10.50%)	21 (4.60%)	457 (100.00)

Side scrapers (Figs. 37, 39, Table 26)

Side scrapers were identified by the following characteristics. A flake whose one or both flake margins have been trimmed by inverse or direct retouch. In some specimens only a portion of the edge is modified, while in others, the modified portion forms a notch. The resulting modified edge may be straight, slightly convex or concave. In the assemblages studied here, side scrapers make up the largest majority of all the scrapers. On the basis of morphology and overall outline, side scrapers have been divided into single side scrapers, double side scrapers, concave side scrapers and notched side scrapers. The last two are considered by Nelson (1973:199-203) as independent from side scrapers.

i. Single side scrapers (Figs. 37k-l, 39a-f)

These are scrapers made on flakes one of whose edges has been modified by retouch . Edge modification is usually by inverse retouch but in rare cases it may be direct. The scraping edge is straight or slightly convex. Single side scrapers are liable to intergrade with backed flakes. They may be simple flat flakes or may have a triangular keeled cross-section. The distinction between the two is the angle of retouch; sharper and near perpendicular retouch in the case of side scrapers. They correspond in part to Tixier's (1963: Fig. 43-8; 56-12; 57-6).

ii. Double side scraper (Figs. 37m-o, 39g-j)

A flake whose both edge are retouched to produce scraping edges. Inverse retouch is the rule but alternate retouch is

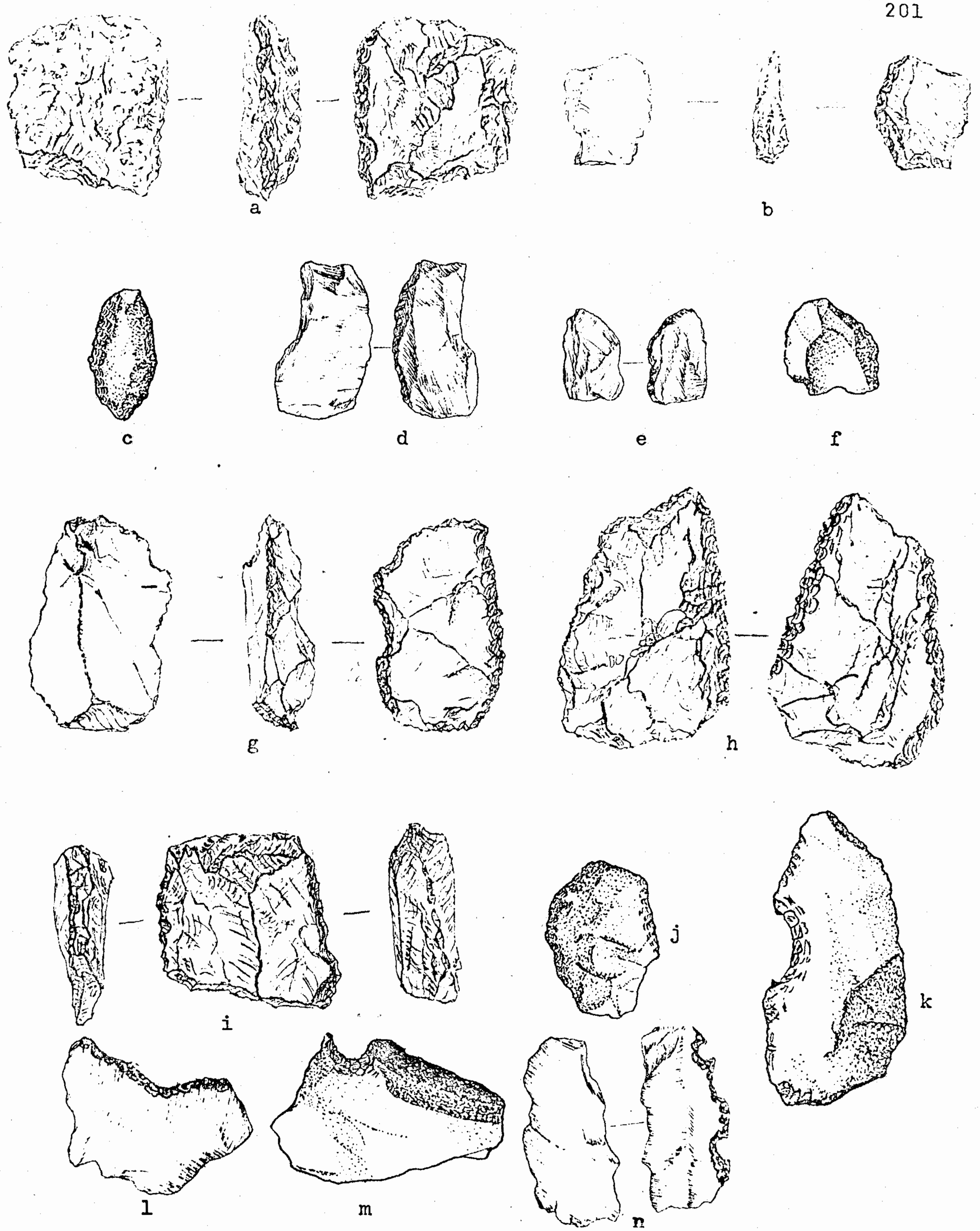


Fig. 39 Side scrapers; single side scrapers a-f, double side scrapers g-j, concave side scrapers k-l, and notched side scrapers m-n.

observed in some specimens. The retouching usually terminates with the distal end of the flake, but instances where the retouching is all around the distal end, and producing a convex ended scraper have also been observed. They intergrade with double backed flakes. Some authorities (Odner 1972:42; Sampson 1972:187) include both single side and double side scrapers into one category. They correspond in part with Tixier's (1963: Fig. 43-9, 13) .

iii. Concave side scrapers (Figs. 37p-q, 39k-l)

These are simple side scrapers with concave scraper edges. They intergrade with notched scrapers, but in the concave scrapers, the retouched edge is normally shallower and longer. Concave side scrapers are rare in the assemblages and are said to be uncommon in East African Late Stone Age, except at Hyrax Hill where they reached a frequency of 10.6% (Nelson 1973:199). The tradition in East Africa, as well as in most sub-Saharan Africa, has been to treat concave and notched scrapers together (M. D. Leakey 1945:293; Gabel 1969:228), but in an earlier writing, Gabel (1965:40) distinguishes concave from strangulated and notched forms. Strangulated forms are said to be absent in East Africa (Nelson 1973:201). The concave scrapers considered here partially correspond to Tixier's (1963: Fig. 43-1; 45-7).

iv. Notched side scrapers (Figs. 37r-s, 39m-n)

Nelson's (1973:201) distinction, i.e. "A scraper with one or more concave scraping edges which are shorter than 1.0 cm." has been adopted. The notch is normally deeper than that of a concave edge. Overall, notched scrapers are rare not only in the assemblages studied, but also in East Africa (Nelson 1973: 201). They intergrade with concave scrapers and various retouched waste. This type is equivalent in part to Tixier's (1973: Fig. 43-2, 3, 5).

Measurements for all side scrapers are oriented to the flake axis.

KANDAGA A9	sample	mean	S.D.	W/L ratio %
length	110	2.42	0.73	79
width		1.90	0.65	
MAJILILI 2B				
length	36	2.75	0.79	80
width		2.20	0.60	
KWA MWANGO				
length	71	2.48	0.65	72
width		1.78	0.50	
KIRUMI ISUMBIRIRA				
length	70	2.83	0.68	77
width		2.17	0.71	

Unlike the end scrapers there seems to have been a deliberate effort to choose flakes whose lengths are almost half as much as their width for the manufacture of side scrapers as shown by the w/l ratios.

Convex Scrapers (Figs. 37w-y, 40)

These are scrapers whose overall outline of the scraping edge forms an arc which may be fan shaped, crescentic,

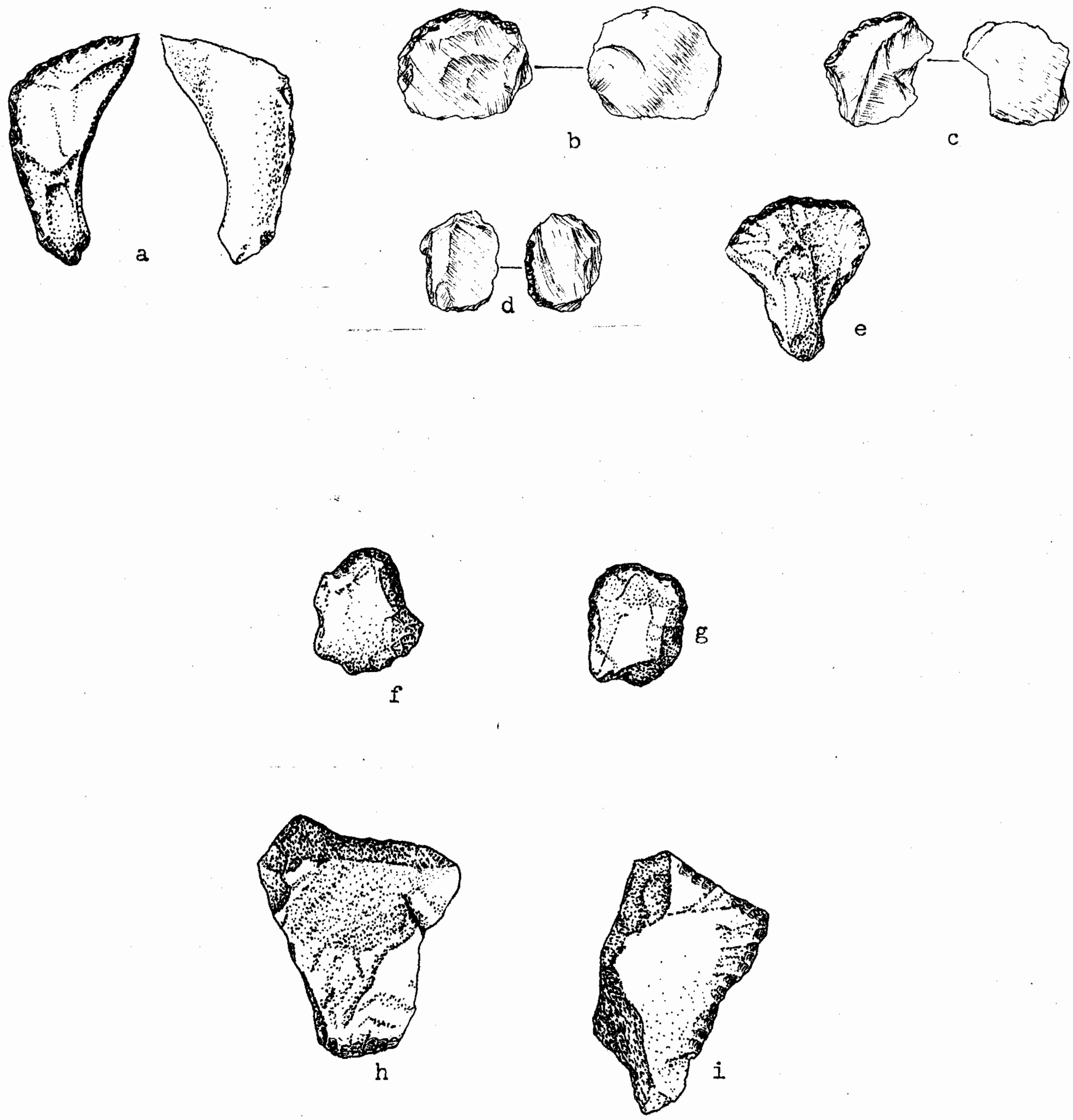


Fig. 40 Convex scrapers (a-e), Nosed scrapers (f-g) and Irregular scrapers (h-i).

approaching a semicircle or an almost complete circumference. In general most have a discoid shape, and in the cases where they have not been retouched round the whole edge, they resemble thumbnail scrapers. The latter were considered by many authors (e.g. Odner 1971:185; O'Brien 1939:269; Cole 1963:213-5; Leakey 1936:68) as characteristic of the "Wilton". Contrary to Odner's observation (1971:185) that the specimens he analyzed from Lulullampembele had normal retouch, those in the present study showed inverse retouch. Because of the almost imperceptible overlap with circular and thumbnail scrapers, this type includes such forms as semi-circular convex scrapers, circular convex scrapers and thumbnail scrapers identified by Nelson (1973:194-7) as distinct types. This type is also considered equivalent to the discoidal scrapers of M. D. Leakey (1945:291) and Gabel (1965:37); These forms also intergrade with retouched waste; thus Miller (1969:518-21) refers to them as semicircular and round chunk scrapers.

The distinction made by several prehistorians to classify different forms of convex scrapers as mentioned above was critically considered, but due to the lack of enough comparable specimens in the assemblages and the continuum inherent in the forms it was decided to lump them together. A breakdown based on morphology and measurements of the retouch edges was considered inconclusive due to the small sample involved. Odner (1971:185; 1972:41-42) has also not broken down the convex scrapers, presumably due also to lack of enough samples.

The types here (Figs. 40a-e) correspond in part to Tixier's (1963: Fig. 12-4, 5) and Nelson's (1973: Fig. III-29: n,o,p,g).

Measurements are oriented within the best fit enclosing rectangle.

KWA MWANGO	sample	mean	S.D.	W/L ratio %
length	23	1.78	0.31	83
width		1.48	0.34	
KIRUMI ISUMBIRIRA				
length	9	1.85	0.28	85
width		1.57	0.26	

Nosed Scrapers (Figs. 37aa-cc, 40f-g)

These are characterized by a narrow constricted convex tip, but otherwise backed on each side by straight or concave retouch. The resulting scraper edge is V-shaped, but variations ranging from a wide V to a round tipped V-shape are found. Nosed scrapers intergrade with oblique ended and convex scrapers.

Nosed scrapers are not common in the assemblages studied nor in the Late Stone Age of southern and eastern Africa, but this may be due to the fact that different people have lumped them together with other types, used different names, or as Nelson (1973:194) has remarked, they are not frequently illustrated or typologically differentiated. Sampson (1972:184-186) for example uses the term "frontal scrapers" instead of nosed scrapers. These types are more or less equivalent to Tixier's (1963: Fig. 13-4) and Nelson's (1973: Fig. III-29:a-d,g,i).

Measurements are oriented to the flake axis.

KWA MWANGO	sample	mean	S.D.	W/L ratio %
length	8	1.46	0.23	92
width		1.35	0.26	

Core Scrapers (Figs. 37t-v, 41)

These are scrapers worked from cores and chunks with irregular and denticulate retouch. While the overall outline is that of a core re-utilized as a scraper, the worked edge is variable: being convex, concave, notched or a combination of these. This category has been recognized by Leakey and Leakey (1950:7), Odner (1971:185; 1972:42) in the East African Late Stone Age and by Clark (1974:126), Fagan and Van Noten (1971:82) and Gabel (1965:37) in southern Africa. Some of the scrapers in this category would fall under Nelson's miscellaneous scrapers (Nelson 1973:205). Core scrapers intergrade with irregular scrapers and with cores. As Clark (1974:126) has remarked, it is rather difficult to decide whether a core should be classified as a core scraper or simply as a core:

> ...since the amount of trimming is very variable and at least some of this would seem to have been produced by the normal preparation of the edge of the platform before the removal of flakes...

However, the distinguishing criteria are the amount of bruising and blunting of the edges in addition to the retouch.

This type corresponds in part to Tixier's (1973: Figs. 12-6;13-2).

Measurements are oriented within the best fit rectangle.

MAJILILI 2B	sample	mean	S.D.	W/L ratio %
length	34	2.95	0.88	73
width		2.16	0.58	
KWA MWANGO				
length	48	2.60	0.59	78
width		2.02	0.46	
KIRUMI ISUMBIRIRA				
length	38	3.20	0.76	76
width		2.42	0.71	

Irregular Scrapers (Figs. 37dd-ee, 40h-i)

These are scrapers made from chunks and which possess highly variable outlines and cross-sections. The worked edges are not situated in any consistent relationship to the outline or talon (Nelson and Posnansky 1970:145; Odner 1972:42). They have been referred to as informal scrapers (Nelson 1973), non-regular scrapers (Odner 1972) and described by Gramly (1975) as scrapers with different faces and non-opposed striking platforms. They intergrade to a very large extent with retouched waste and much less with core scrapers. They are distinguished from retouched waste simply by size; i.e. they must be at least 1.0 cm. in any of the three dimensions. Tixier (1963) lists no types equivalent to these.

Measurements oriented within the best fit rectangle, with the greatest dimension as the length.

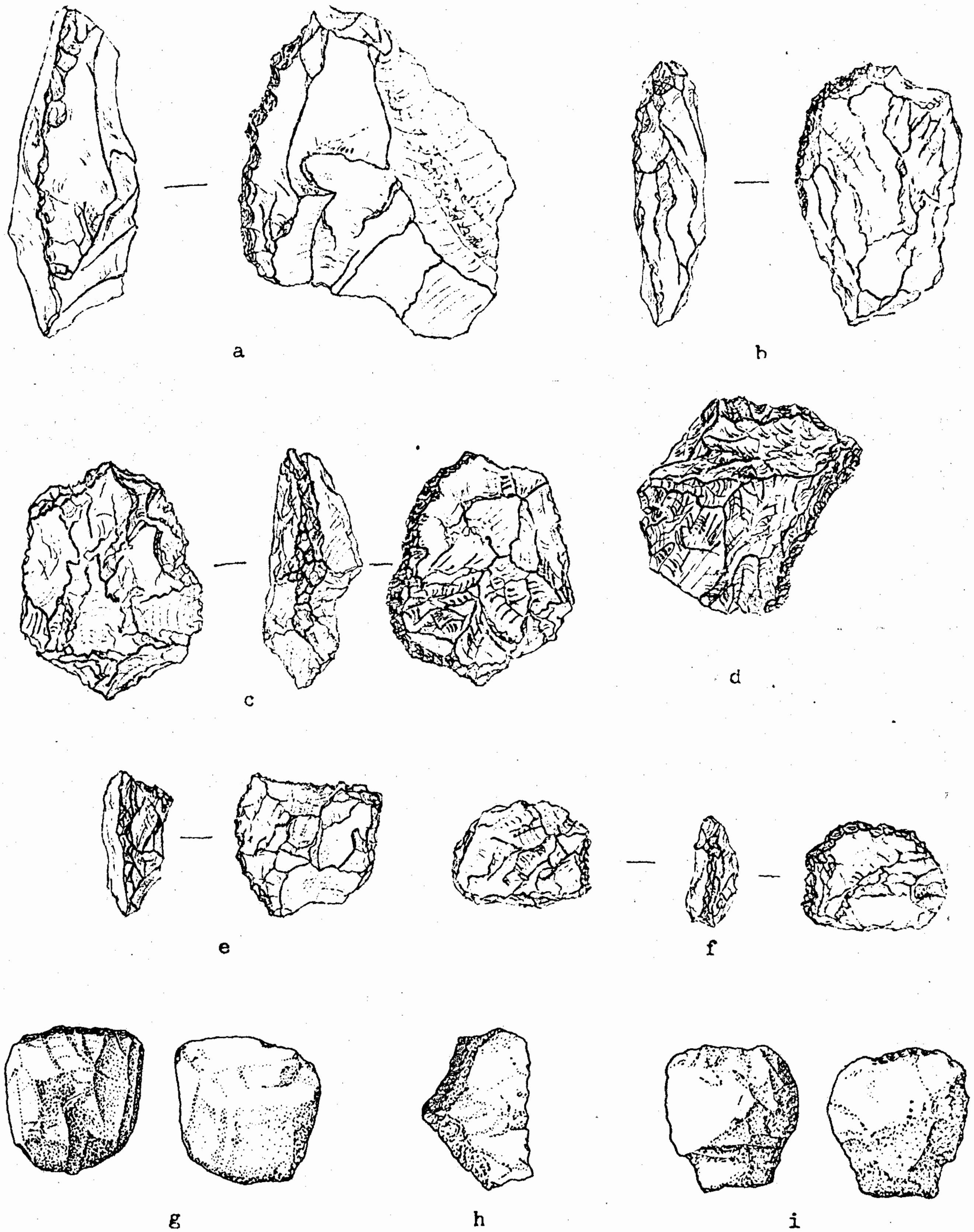


Fig. 41 Core scrapers from Kandaga A9 (a–b), Majilili 2B (c–d) Kwa Mwango (e–f) and Kirumi Isumbirira (g–i).

Table 27: Coefficient of Variation (CV)* of scraper length and width based on four assemblages.

	Kandaga A9	Majilili 2B	Kwa Mwango	Kirumi Isumbirira
End Scraper				
length	30.88%	32.94%	26.93%	36.16%
width	39.53	34.92	41.15	34.70
Side Scraper				
length	30.17	28.73	26.21	24.03
width	34.21	27.27	28.03	32.72
Convex Scraper				
length	-	-	17.42	15.14
width	-	-	22.99	16.55
Core Scraper				
length	-	29.83	22.69	23.75
width	-	-	22.77	29.34
Irregular Scraper				
length	18.66	57.45	23.04	30.08
width	30.54	39.47	28.24	35.44

$$*CV = \frac{\text{standard deviation} \times 100}{\text{mean}}$$ (Sokal *et al* 1969)

KANDAGA A9	sample	mean	S.D.	W/L ratio %
length	4	2.09	0.39	80
width		1.67	0.51	
MAJILILI 2B				
length	5	2.28	1.31	67
width		1.52	0.60	
KWA MWANGO				
length	25	2.17	0.50	78
width		1.70	0.48	
KIRUMI ISUMBIRIRA				
length	16	2.56	0.77	80
width		2.06	0.73	

The coefficient of variation (Table 27) is an estimate of variation within similar categories of scrapers. Length and width variations are, for instance, seen to be greatest in the end scrapers and least in core scrapers while in terms of assemblages, Kirumi Isumbirira shows the greatest variation in end scrapers and Kandaga A9 in side scrapers. The highest length variation is recorded for core scrapers from Majilili 2B but this may be due to the small sample rather than an indication of true variation.

Outils écaillés (Fig. 42)

These are artifacts exhibiting numerous and rather sinuous short-stepped flake scars, sometimes associated with intensive crushing on one or more edges. The stepped flaking is rarely unifacial, and in many specimens the working edges are opposite

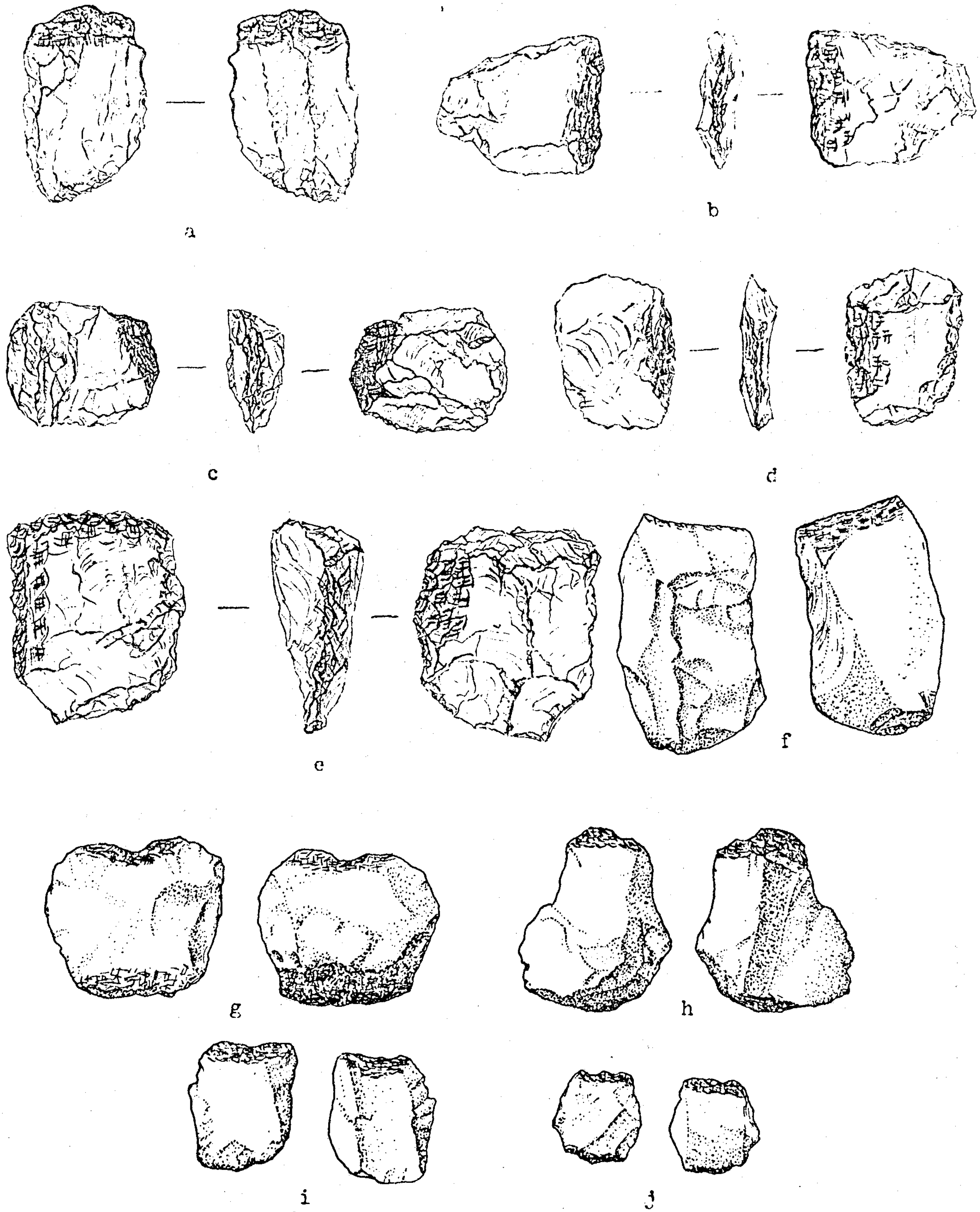


Fig. 42 Outils écaillés from Kandaga A9 (a-c), Majilili 2B (d-e) Kwa Mwango (f-g) and Kirumi Isumbirira (h-j).

one another, an attribute which makes most of them difficult to distinguish from bipolar cores (Nelson and Posnansky 1970: 149; Odner 1972:50). As noted by MacDonald (1968:85), they are generally rectangular and exhibit bipolar flaking from paired, crushed and battered surfaces.

Outils écaillés as a tool type constitute a major class not only in the four assemblages studied (Tables 8, 11, 14 & 18) but also in Late Stone Age assemblages of East Africa (Nelson 1973:208) and that of Zambia and Malawi (Clark 1974:128). The confusion inherent in the intergradation between *outils écaillés* and bipoar cores and their preponderance in Late Stone Age assemblages necessitates some discussion of this class.

Working in New Guinea, White (1968) has argued and shown that most of these *outils écaillés*[22] are the product of the bipolar technique and Hayden (1973) has shown that scalar cores which bear some of the attributes of *outils écaillés* are produced after small flakes have been struck using the bipolar technique.

These findings pose the question whether some or most of what have hitherto been classified as *outils écaillés* in sub-Saharan Africa are bipolar cores or tools. Gramly (1975) who uses the term *pièces esquilleés* (splintered objects) argues that since the largest flake removals were too thin to

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[22] However, Dr. B. Hayden (pers. comm.) has told me that White's artifacts from New Guinea were not *outils écaillés* but cores.

be useful for tool production, it is likely that they were tools and not cores. Nelson (1973:208-226) offers a detailed argument in support of the view that _outils écaillés_ are tools. He raises the point that if these artifacts are considered cores, "typological variation within the assemblages will be converted to basic technological variation." (Nelson 1973:208) Since processes of flake manufacture change less readily than patterns of tool morphology, treating _outils écaillés_ as cores would seriously question technological stability, and affect the relative frequencies of other tool types. A summary of his eight points in support of his argument is given below:

1. When _outils écaillés_ form a primary core type, they must begin as relatively large blocks in order to produce flakes large and regular enough for the manufacture of microliths, burins, scrapers and other tools. As the cores diminish in size, fewer and fewer useable flakes will be produced and consequently, the assemblages would contain an unusually large proportion of waste. Contrary to this; where _outils écaillés_ were made as tools from waste, frequency of debris is proportional to that of _outil écaillés_. This is what is observed in the East African Late Stone Age assemblages.
2. The bipolar core technique would produce _outils écaillés_ with regular opposing platforms which must occur in pairs, but the East African material includes sub-

stantial specimens of various edge arrangements. Such specimens are not explained in high frequencies by a bipolar core technique.

3. With the bipolar technique, only larger flakes would be chosen as cores, but at least 10 to 20% of all <u>outils écaillés</u> were manufactured from flakes too small to be used as cores.
4. Between 10 and 25% of all <u>outils écaillés</u> are reduced to bipointed forms beyond the theoretical point of usefulness as cores.
5. Experimental application of the bipolar core technique to produce <u>outils écaillés</u> yields high relative frequencies of angular waste not characteristic of Late Stone Age assemblages even where <u>outils écaillés</u> are abundant.
6. If <u>outils écaillés</u> represented a secondary core form derived from the final exhaustion of other blade and flake cores, there should be a systematic reduction in core length when single platform cores, double platforms, or platform-like areas opposite the worked edge, <u>outils écaillés</u> with edges, and pointed forms of <u>outils écaillés</u> are compared. Such a pattern is only occasionally present in Late Stone Age assemblages from East Africa.
7. <u>Outils écaillés</u> are occasionally manufactured on crescents and end scrapers (three specimens from

Tunnel Rock).

8. There is a systematic relationship between the size of tools which cross-cuts typological boundaries in East African Late Stone Age assemblages. If, for example, in two assemblages, scrapers are larger in assemblage A than in B, then the microliths will also be larger in A by a corresponding amount. This relationship does not consistently hold for cores; and so it is significant that _outils écaillés_ regularly behave like other classes of tools.

In addition Nelson (1973) argues that in some assemblages such as that from Tunnel Rock Shelter where the raw material used was obsidian, cores are uncommon while _outils écaillés_ are abundant. This observation is contrary to Clark's (1974:128) observation in Zambia and Malawi where _outils écaillés_ are abundant in assemblages using quartz as the raw material and rare where the raw materials was finer. Although the frequency of _outils écaillés_ increases with that of cores, it is far too little to suggest that the primary, core form was bipolar. That _outils écaillés_ are tools is supported by the following observations.

1. Over 50% of the _outils écaillés_ at Tunnel Rock Shelter are manufactured from relatively thin flakes whose flake release surfaces have been but partially removed through subsequent modification.
2. It is possible to separate a large proportion of the

flakes which were detached in the manufacture of outils écaillés. The frequencies of such flakes help to show how the relative proportions of outils écaillés and debris are tied together.

3. Tools actually manufactured from flakes which come from outils écaillés are uncommon.
4. A significant proportion of the waste appears to be derived from blade and flake cores which are substantially larger than the largest outils écaillés or their associated flakes.

On the above evidence, Nelson (1973) concludes that all outils écaillés in some East African Late Stone Age sites and most outils écaillés from other sites, functioned primarily as tools (stress mine). This does not preclude the possibility that some specimens were produced by a bipolar flaking technique. "On the whole, however, currently available data suggest that this category is better treated as a tool class." (Nelson 1973: 226).

Before any comments can be made on Dr. Nelson's (1973) reasons and his conclusions, it is ncessary to point out that his data is based on 29 assemblages from 13 archaeological sites in East Africa, and selected museum collections. As such, his study, unlike others which concentrate on one or two excavations and/or museum collections, is by far the most comprehensive comparative analysis of the Late Stone Age of East Africa. The 13 sites excavated by Nelson include both open-air sites as well as rock shelter sites and cover a large geographical area from North Uganda to Western Kenya. On the contrary the data for the present study is drawn from four rock shelter sites excavated by the author and consequently the data are perhaps less representative than Nelson's. The comments must therefore be taken in the context of the data forming the corpus of the present study.

1. It is true that most of the _outils écaillés_ in the assemblages analysed here would be too small for the manufacture of flakes suitable for microliths, scrapers and other tools. Most of them also exhibit definite crushing along one or two edges, from resting on an anvil and the impact from flaking. They show definite fissures radiating out from the area of percussion. The point is, most of the _outils écaillés_ were manufactured by the bipolar techniques, presumably from pebble cores or small angular fragments of material. MacDonald (1968), has also observed that they occur predominantly in industries based on small source material in association with pitted anvil stones. Contrary to Nelson's observation, most have opposing regular platforms.
2. Most of the _outils écaillés_ from the assemblages studied here are made from small flakes and not from bipolar core-like waste. Sampson (1972:185) on the other hand reports that the _outils écaillés_ are thick flakes or fragments with a curved working edge formed by a large flake scar on one surface.
3. The frequency relationship of _outils écaillés_ and waste

on one hand, and bipolar cores and waste on the other in any assemblage is difficult to establish in the present confusion between bipolar cores and _outils écaillés_. One would expect the frequency of waste to be higher in assemblages where the proportion of bipolar cores is higher than that of _outils écaillés_, but how much higher is not known. This could perhaps be established by experiments of producing _outils écaillés_ by bipolar technique. The present author has not performed such experiments and is therefore unable to comment on whether the technique would yield high frequencies of angular waste.

4. No _outils ecaillés_ were identified as having been manufactured on crescents and end scrapers as observed by Nelson. It is however doubtful whether Nelson himself considers this observation of much diagnostic significance, especially when only three specimens from one of his 13 sites were identified as having been manufactured on crescents and end scrapers.

5. The mean length and width values for _outils écaillés_ are closer to those of other tools than to bipolar cores, and seem to confirm Nelson's observation that there is a systematic relationship between the size of tools which cross-cuts typological boundaries. When the mean length of _outils écaillés_ and other tools are related to the mean length of bipolar cores

it is found that while outils écaillés show a close relationship with other tools, bipolar cores do not (Figs.43,44). Opinions as to the classification of outils écaillés (pièces esquilleés) differ, thus MacDonald (1968) writes:

> Pièces esquilleés differ from most concepts of a tool since there is no stage at which they can be considered finished. They are initially short spalls or blocky fragments which rapidly disintegrate through use until they reach a size that is difficult to hold, at which time they are discarded. Consequently there are no intermediate steps of tool manufacture and attempts to break them down to types lead to criteria which reflect only stages of exhaustion... (MacDonald 1968:86)

However, MacDonald's observation is not really unique since it is the general case with most tools. Van Riet Lowe (1946:241), on the other hand, is of the opinion that outils écaillés and bipolar cores are more or less the same thing, but very few prehistorians would concede to this. He seems to imply that they are bipolar cores which have been utilized as chisels.

6. The flake scars left on the crushed edge are so short (mean length = 2.5 mm.) and stepped that they could not represent the removal of flakes useful for any tools. Rather they are perhaps a result of utilization, crushing or removals of minute sharpening flakes and as such are tools not cores.

In addition, other prehistorians such as Gramly (1975), Odner (1972:50), Nelson and Posnansky (1970:142-143), Gabel (1965:40-44), Sampson (1972:185), Fagan and Van Noten (1965:

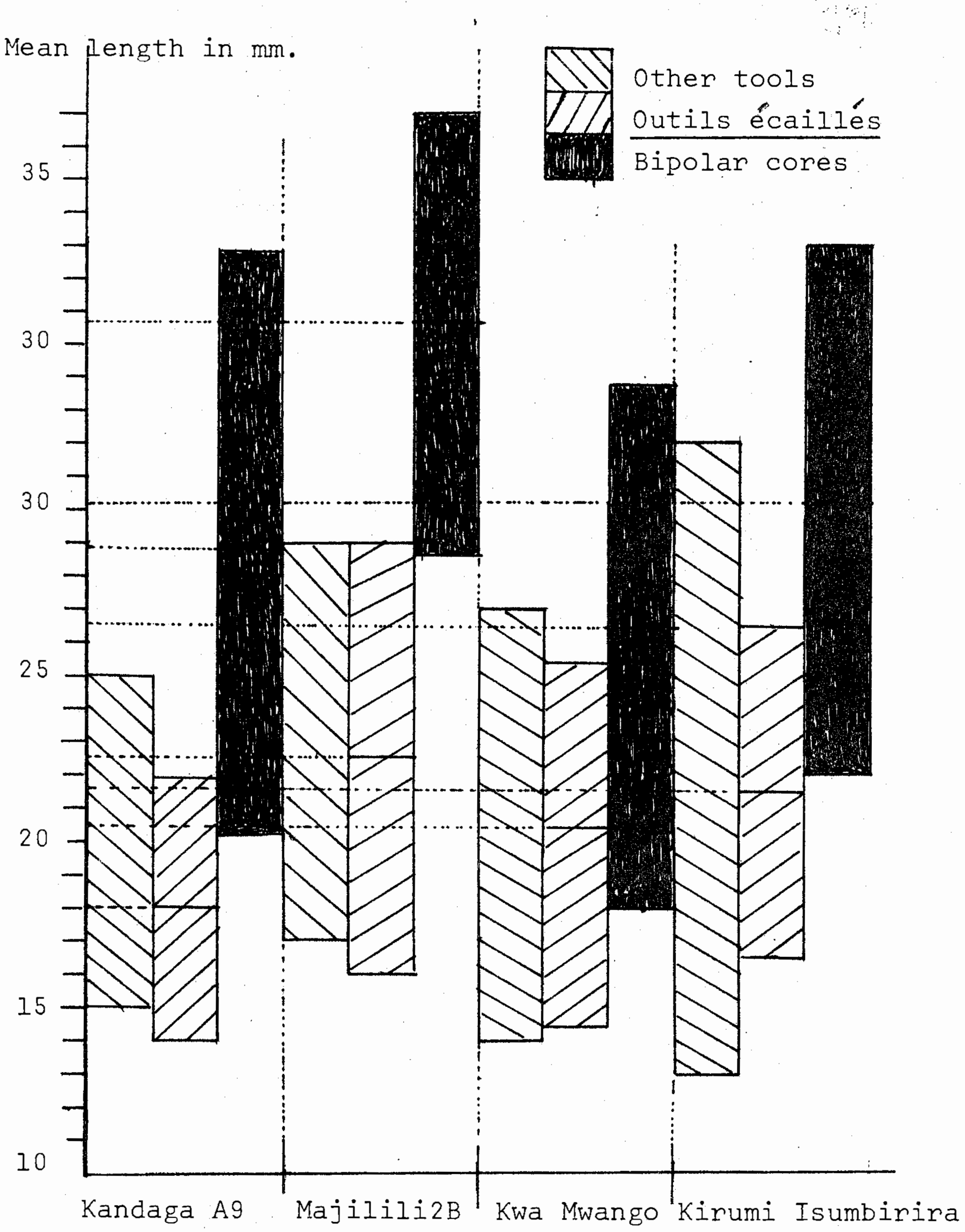


Fig. 43 Comparison between the mean length of outils écaillés and the mean length of other tools on one hand and that of bipolar cores on the other in the four central Tanzania LSA sites. Note that there is more closeness between the mean length range of other tools and outils écaillés than there is between either and the range in the mean length of bipolar cores.

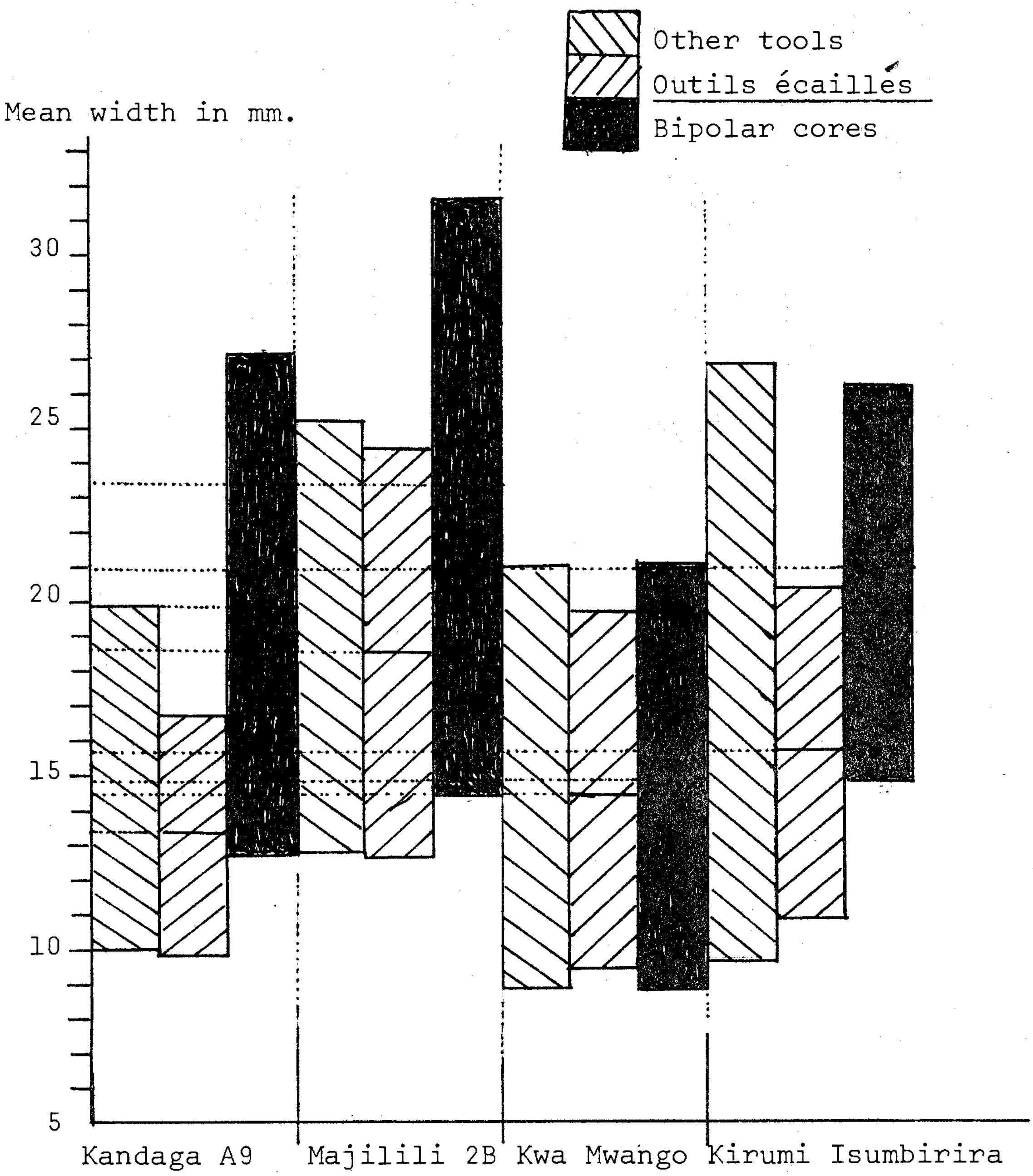


Fig. 44 Comparison between the mean width of outils écaillés and the mean width of other tools on one hand and that of bipolar cores on the other. As in Fig. 43, the mean width range of outils écaillés and that of other tools is more comparable than is either with that of bipolar cores. Kwa mwango is slightly exceptional in that the mean width range of other tools is more comparable to that of bipolar cores, an anomaly probably attributed to a small sample size.

40-41), Clark (1968) and Miller (1969:40) consider *outils écaillés* tools, although in a later publication, Clark and Kleindienst (1974:93) following the finds of White (1968) implicitly find reason to consider most, if not all of these *outils écaillés* as the by-products of bipolar technique. Until more comparative data is available from more sites in sub-Saharan Africa, the concensus of opinion that these *outils écaillés* are tools, remains. However, one qualification is considered necessary: i.e. these are tools some of which are manufactured by the bipolar technique. They intergrade to a very large extent with bipolar cores and waste. However, the differentiating criterion employed in the analysis was on the basis of the presence of flake attribute(s). Artifacts were scored as *outils écaillés* if one or any combination of the following attributes could be detected:

a. a bulb of percussion
b. a flake release face
c. point of percussion
d. relatively small thickness compared to the width or length, and
e. crushed or stepped edges instead of identifiable flake scars as in the case of bipolar cores.

There are various terminologies associated with this category. Leakey (1931) has used the terms "fabricator, sinew frayers" and "*lame écaillés*"; M. D. Leakey (1945:292-295) has used both *lame écaillée* and *outil écaillés*; Gabel (1965: 40-41; 1969:234) follows Clark (1958) and uses *outils écaillés* to refer to utilized blades and flakes used as fabricators.

The term *pièce esquillée* has been used by Deacon (1972:14), Miller (1969:524), Fagan and Van Noten (1971:90) and Gramly (1975:14-15), while Clark (1974) has used *outil ésquillée*. The term *outils écaillés* is more commonly used in sub-Saharan Africa than *pièce esquillée* and following Nelson's (1973) suggestion, the former is used in preference to the latter. They have a generally wide distribution in sub-Saharan Africa both in the Middle Stone Age and Late Stone Age industries (Van Riet Lowe 1946:241). *Pièces esquillées* are generally considered to combine several functions, primarily as a wedge but secondarily as a slotting tool both of which are associated with the groove and splinter technique of working bone, ivory and hard wood (MacDonald 1968:88). Semenov (1964:148-149) has also remarked on their possible use for chiselling, notching or cutting ivory and as gouges for working bone and probably wood. Perhaps, as suggested by MacDonald (1968) and Semenov (1964) and in the apparent scarcity of burins in these assemblages, *outils écaillés* indicate an alternative technique of working wood and bone.

This category corresponds to Tixier's (1963: Fig. 56-1, 2,3).

Measurements are oriented with the long axis passing through the crushed edges.

KANDAGA A9	sample	mean	S.D.	W/L ratio %
length	100	1.80	0.38	74
width		1.34	0.34	

MAJILILI 2B	sample	mean	S.D.	W/L ratio %
length	44	2.27	0.66	81
width		1.85	0.59	

KWA MWANGO				
length	116	2.04	0.59	71
width		1.44	0.49	

KIRUMI ISUMBIRIRA				
length	122	2.17	0.59	77
width		1.57	0.48	

Fabricators (Fig. 45n-o)

These are flakes of triangular cross-section heavily crushed along the median range or on any two of the edges. Unlike the outil écaillés, all the examples recognized are manufactured from undisputable flakes. As has been mentioned earlier, Leakey (1931) used the terms fabricator and lamé écaillé synonymously. Fabricators have been recognized in East African Late Stone Age by Odner (1972:50) and Gramly (1975:18) and in other sub-Saharan Late Stone Age assemblages by Clark (1942:177), though not in his later publications. See also Gabel (1965:41) and Mason (1962:320). Fabricators do not seem to form a sizeable proportion in the tool class in the assemblages studied here nor in East Africa as a whole. They may intergrade with utilized flakes and waste.

Measurements are oriented with the flake axis.

KWA MWANGO	sample	mean	S.D.	W/L ratio %
length	13	2.65	0.61	51
width		1.35	0.41	

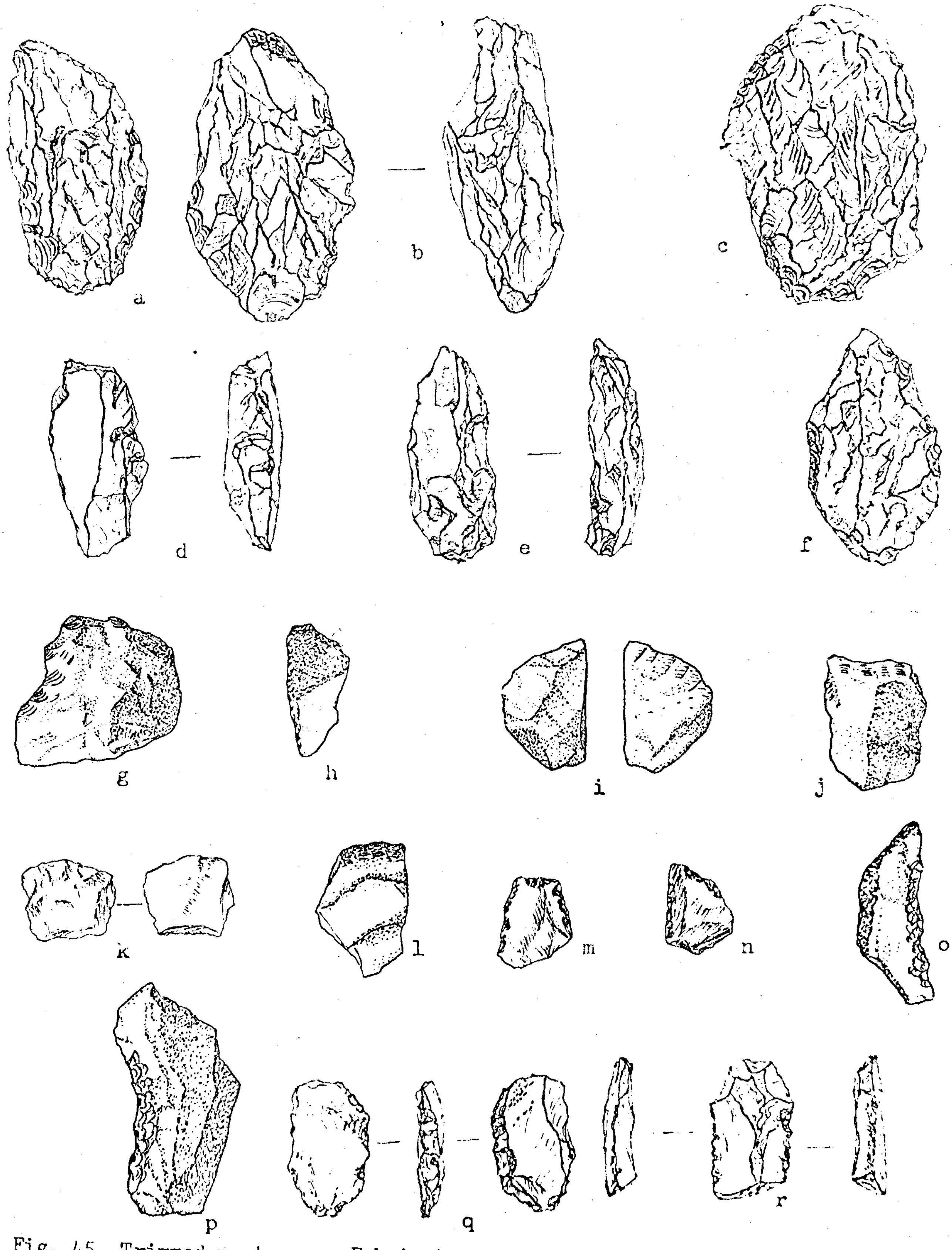


Fig. 45 Trimmed waste a-m, Fabricators n-o, and Utilized flakes p-r.

KIRUMI ISUMBIRIRA	sample	mean	S.D.	W/L ratio %
length	16	2.43	0.81	76
width		1.85		

Becs (Fig. 46a-c)

These are pointed implements made from flakes and other angular waste.

The point is usually formed by retouching the intersection of two snaps or fractures or some other naturally sharp point or apex (Nelson and Posnansky 1970:143; Odner 1972:51). The retouching may be casual but more often involves discontinuous retouch on either side of the spur (Nelson 1973:242). The result is either two slightly concave or convex sides tapering to a point. Although becs are reported to be a common element in the unshaped tool categories with the East African Late Stone Age assemblages (Nelson 1973), they are rare in the assemblages analyzed here. They intergrade with retouched angular waste.

Measurements oriented within the smallest enclosing rectangle.

KWA MWANGO	sample	mean	S.D.	W/L ratio %
length	17	1.98	0.50	74
width		1.46	0.47	
KIRUMI ISUMBIRIRA				
length	11	1.99	0.49	69
width		1.37	0.36	

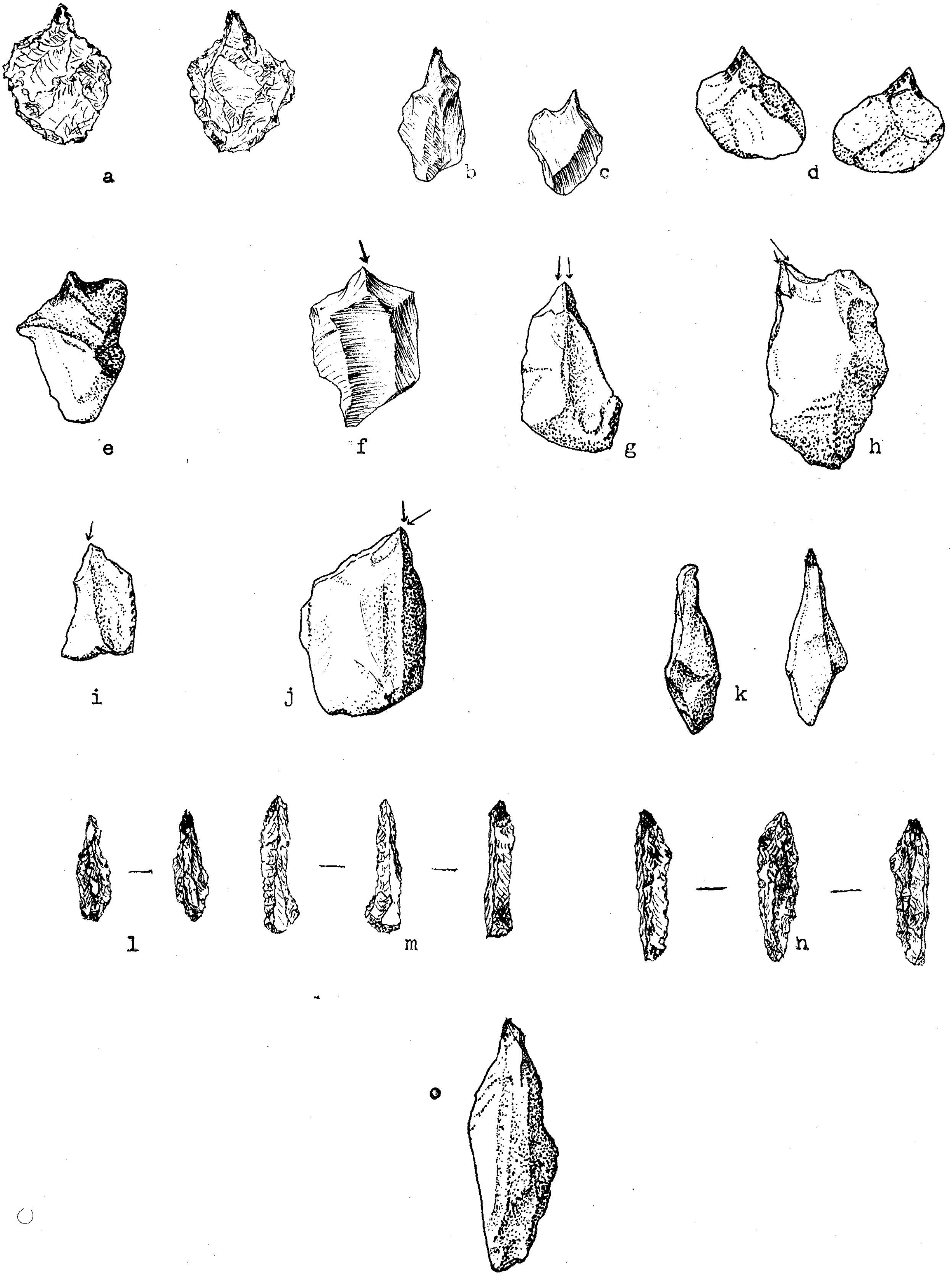


Fig. 46. Becs and borers a–e, Possible burins f–j and Spikes l–o.

Spikes (Fig. 461-o)

These are elongated pieces of angular waste with a narrow bit-like edge which in some specimens shows some short stepped flake scars. They may be triangular, quadrilateral or polygonal in cross-section, the triangular ones resembling burin spalls and would be taken as such, except for the fact that burins are very rare in these assemblages. In other respects they resemble longitudinal fragments of outils écaillés and/or bipolar blade cores but possess only one slightly crushed end. Although they have been reported from Nsongezi rock shelter (Nelson and Posnansky 1970:143) it is very doubtful whether they were intended as tools at all. Nelson and Posnansky (1970) suggest that they may represent an extension of the outils écaillés technique to narrow flakes. The present author thinks they are simply technical angular waste chosen for their shape to be used as punches although there is not enough crushing at the ends to support this speculation. They intergrade with angular waste.

Measurements oriented with the longitudinal axis passing through the apex.

KWA MWANGO	sample	mean	S.D.	W/L ratio %
length	30	2.36	0.62	33
width		0.78	0.27	
KIRUMI ISUMBIRIRA				
length	17	2.35	0.58	34
width		0.81	0.34	

Burins (Fig. 46f-j; Tables 28-29)

Burins are rare in the assemblages studied here although higher frequencies have been reported from other East African Late Stone Age assemblages (Nelson and Posnansky 1970:131-36; Nelson 1973:227-241). The distribution of burins in sub-Saharan Africa seems to become less frequent the further south one goes. In East Africa numerous significant burins have been reported from site in Uganda and Kenya but further south (Rwanda, Tanzania, Zambia, Rhodesia and South Africa) they are not so frequent (Nelson 1973:236). The picture in Tanzania is yet well understood because other than the four Late Stone Age sites excavated by the author, and three more excavated by Leakey, Inskeep and Odner accordingly, not much more is known of the Tanzania Late Stone Age industries. Inskeep's Kisese II site (1962) yielded some burins but at the time of writing a full report of the excavation has not been published. Odner's (1971) Lululampembele site yielded only four significant burins and four technical burins.

Only 34 specimens, were identified as burins in these assemblages. All except five are considered possible technical burins rather than significant burins, as they lack any sign of utilization or retouch on the burin facet and hence are treated as unshaped tools. Nelson (1973) lists five main criteria used to distinguish significant burins:

a) the presence of multiple burin facet

b) utilization of the burin edge

c) association of the burin facet with a blunted truncation

d) conformation of the specimen to an overall morphological pattern within the occurrence, site, industry or region from which it comes.

e) the absence of evidence demonstrating that the potential burins are narrowly fluted blade cores or Krukowski microburins.

Secondary criteria include:

a) preparatory retouch along the edge from which a burin facet has been removed, and

b) the use of a notch to inhibit progress of a burin facet. (Nelson 1973:229)

i. Significant burins (Fig. 46h-j)

Five of the specimens are considered significant burins because there is evidence of retouch on the edge adjacent to the burin facet. Two of these are burins on a crescent, one on a convex scraper and the other two are nucleaform burins.

The first three are angle burins. Their bits are formed by the intersection of the burin facet with a snap or a step fracture. The platform from which the burin spall is struck is casually retouched on the <u>talon</u> and the bit shows signs of utilization in the form of fine nibbling.

The two nucleoform burins on the other hand are classified as dihedral. In either case, the butt is formed by the three intersecting facets so that hardly any burin platform is left. In both specimens, one of the facets close to the

Table 28 : The distribution of burins in Late Stone Age occurrences in East Africa, partly after Nelson (1973:232) and Odner (1971).

Occurrence	Shaped Tools	% Burins*
Nsongezi Rs/occ 1	38	5.3
occ 2	107	9.3
occ 3	36	0
occ 4	56	8.9
Total	237	7.2
Kantsyore Island	518	1.5
Nyabusora Rs	20	0.0
Nyero Rs	165	0.0
Iriri	9	0.0
Kalokurok	122	0.0
Muringa Rs/lower occ	46	0.0
upper occ	267	0.4
Magosi II Rs/occ 1	237	9.7
occ 2	241	15.4
occ 3	429	4.2
occ 4	288	4.9
occ 5	277	4.3
occ 6	286	1.7
Total	2188	5.0
Tunnel Rs/occ 1	159	0.0
occ 2	163	0.6
occ 3	135	1.5
occ 4	101	2.0
Total	558	0.9
Naivasha Ry Rs/occ 1	419	5.0
occ 6	2377	5.3
Total	2796	5.2
Long's Drift	425	1.2
Prolonged Drift	343	3.8
Nderit Drift/sec T	106	12.3
sec CC	114	15.9
sec E	50	0.0
sec I	52	11.5
Kandaga A9 Tr I	214	1.40
Tr II	149	2.01
Tr III	340	0.58
Kwa Mwango Tr I	471	0.85
Tr I	183	1.09
Kirumi Isumbirira Tr I	479	2.92
Tr II	119	0.00
Majilili 2B	213	2.82
Lululampembele	212	4.25

*In this table the burins from the central Tanzania assemblages have been included in the shaped tools category.

bit was casually retouched while in one specimen the distal half of the edge of the artifact was also retouched. Both dihedral burins and angle burins are reported from East African Late Stone Age sites, especially from Kenya and Uganda by Leakey (1931), and Nelson (1973). In Tanzania burins have been reported from the Kisese rock shelter by Inskeep (1962) but there is no detailed description of the latter.

ii. Technical burins (Fig. 46f-g)

Most of these are angle burins made on flakes and angular wastes but there are also dihedral technical burins. The bits are made by an intersection of a burin facet or snap on the distal or proximal edge.

The burin facets and bits have no definite evidence of utilization and because of this they are classified as technical burins.

Measurements oriented to the flake axis.

	sample	mean	S.D.	W/L ratio %
length	34	1.50	0.54	67
width		1.68	0.51	

Table 29. Distribution of burins in Late Stone Age rock shelter sites in Central Tanzania, based in part on Odner (1971).

Site	All Tools	% Burins
Lululampembele	280	3.50
Kandaga A9	1512	0.53
Majilili 2B	499	1.59
Kwa Mwango	1663	0.36
Kirumi Isumbirira	1586	0.88

Borers (Fig. 46d-e)

These are very much like the becs except the pointed end is bilaterally retouched. They are usually made from flakes, but conceivably any suitable angular waste could have been used. The point selected for modification is formed by the distal intersection of two converging sides. Borers have also been reported from Lululampembele (Odner 1971), but other than from Kandaga A9 no similar artifacts were recovered from the other three sites excavated by the author.

Measurements oriented to the flake axis.

KANDAGA A9	sample	mean	S.D.	W/L ratio %
length	8	1.97	0.50	51
width		1.00	0.27	

Retouched Waste (Fig. 45a-m).

This category is at best of times difficult to describe adequately for the shapes and sizes are highly varied; being made of flake fragments and different kinds of angular waste. They all, however, have one or more edges casually retouched. They are differentiated from the casually retouched flakes by having more abrupt and sharp retouch and also by the fact that pieces made of whole flakes are rare. It is a category that has never received proper treatment, but Nelson (1973: 244) is of the opinion that other workers have considered these artifacts utilized and treated as such. Alternatively, it is conceivable that other people may have lumped them together under miscellaneous. Odner (1971) refers to them as unidentified trimmed objects while Fagan and Van Noten (1971) and Gramly (1975) have used the terms "retouched chunks" and "tool fragments" respectively, presumably to cover the same category of tools.

The high frequencies in which retouched waste occur in the assemblages is rather puzzling. If they are fragments of tools that broke in the process of manufacture, then the technique would have been very wasteful. It is tempting to surmise whether these artifacts were not simply practice specimens in order to perfect the technique of retouch before an intended tool was worked. Some of these intergrade with scrapers and casually retouched flakes. Due to their highly variable morphology no measurements were taken.

Utilized Flakes and Debris

When these are considered as tools, they constitute a large class in the assemblages. The majority of these are flakes (whole and fragments) and other angular wastes that have been used or minimally modified along the whole or part of one or more edges. The problem of utilization and its recognition will be discussed later. In the specimens considered here, utilization was identified as continuous, but consistent nibbling of the edges producing small, sometimes microscopic scars on the edges. In some specimens the edges have notches and as such they intergrade with the denticulates already described. Clark (1974:127) is of the opinion that such pieces may have served as knives and saws as well as for scraping. The author was told by the local members of the excavating crew, that until recently, some Wanyisanzu people would prefer the sharp flake of obsidian or cryptocrystalline quartz to razor blades and steel knives. Such flakes are said to have been used for various functions including making skin incisions and for smoothing wooden handles, bowstaves and walking sticks.

In defining utilization, the specimens were examined under the low power of a microscope. Most of the fine edged flakes and angular wastes, especially those of cryptocrystalline quartz, had suffered edge damage. Much of the damage is thought to have occurred in transit between the sites and the laboratory. However, most of the specimens damaged in transit were discriminated from the utilized ones by a careful examination of the edges. Whenever the nibbling and edge damage appeared fresh, the specimen was not scored. Only those specimens whose edge damage was ascertained not to have resulted from knocking against each other were scored. Specimens were examined at magnifications of 5x, 10x and in case of doubt at 20x. Even with this careful examination, it is realized that some specimens scored as utilized may have been damaged in transit but such specimens are definitely too few to affect significantly the quantitative assessment of the assemblages.

This category is discussed under "utilized flakes and flake fragments" and utilized blades and blade fragments by

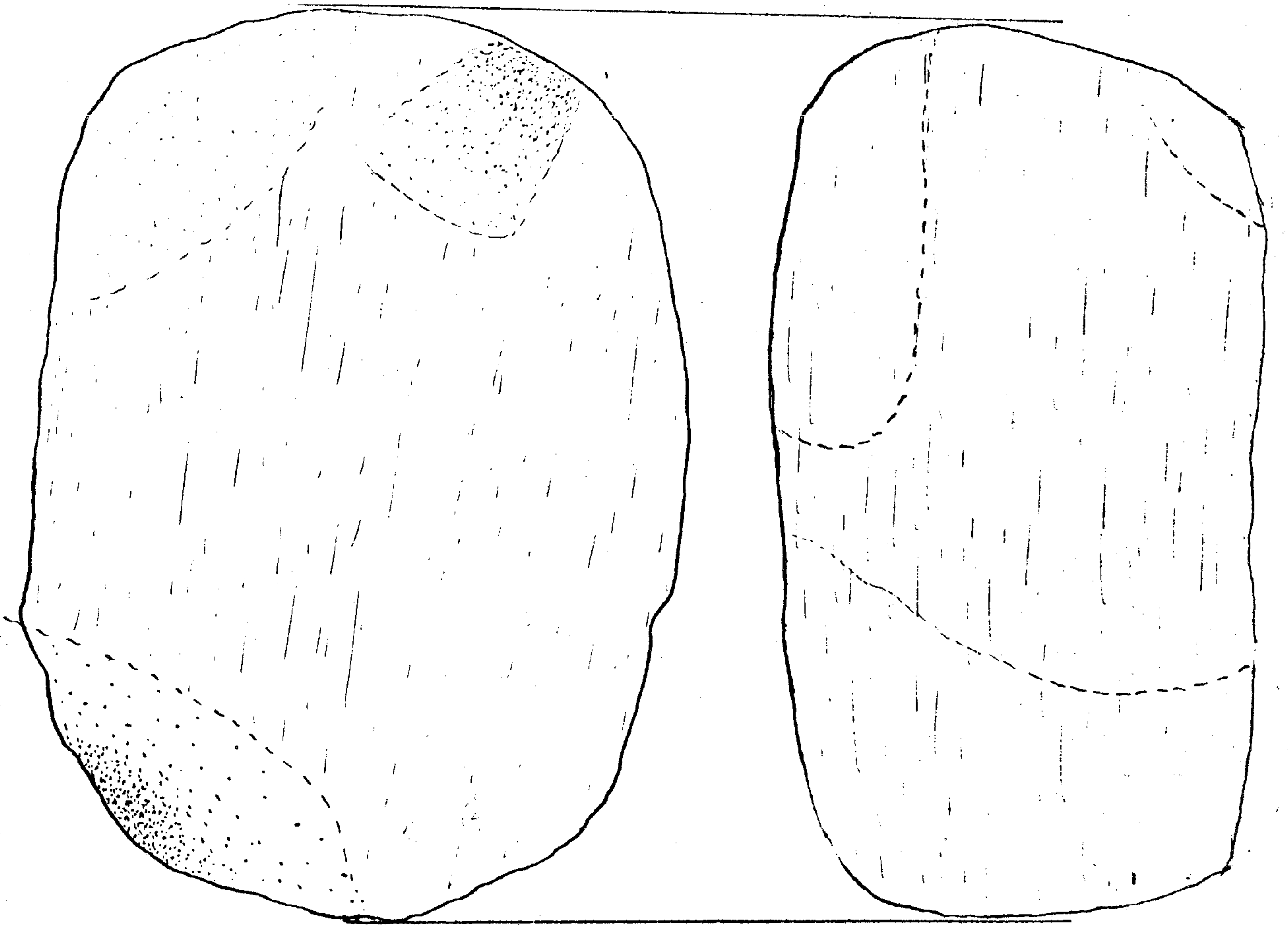
Clark (1974:127), utilized pieces by Fagan and Van Noten (1971:91-92) and utilized flakes and blades by Gramly (1975: 20). They are usually variable in shape and size as shown by the measurements below.

Measurements are oriented with the longitudinal axis passing through the striking platform for the utilized flakes and with the smallest enclosing rectangle for the others.

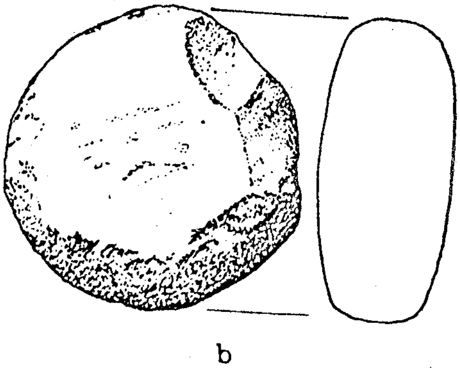
KANDAGA A9	sample	mean	S.D.	W/L ratio %
length	78	2.11	0.59	66
width		1.40	0.46	
MAJILILI 2B				
length	50	2.08	0.42	75
width		1.55	0.50	
KWA MWANGO				
length	117	2.31	0.71	59
width		1.37	0.57	
KIRUMI ISUMBIRIRA				
length	100	2.19	0.66	64
width		1.40	0.47	

Pestles/Rubbers/Anvils (Fig. 47)

These are oval or ellipsoidal pebbles of quartz or quartzite with scarrings,some of which are covered with ochreous pigment. Examination under the higher power of the microscope revealed some minute pitting suggestive of having been used for pounding or grinding. The battering on some may suggest that they were used as hammerstones.



a



b

Fig. 47 Pestle rubber/Anvil from Kwa Mwango. Both were stained with red ochreous paint.

However, some specimens exhibited dimple scars on one or two surfaces, presumably from the contact of successive blows associated with the bipolar technique. Van Riet Lowe (1946:243) has also reported such anvils from the Coastal Smithfield of South Africa (Fig. 50). It is of interest that anvils with dimple scars were found in all the four sites excavated by the author. Such artifacts have also been reported from southern Africa by Clark (1974) and Fagan and Van Noten (1971).

Measurements (complete specimens only) are oriented within the smallest enclosing solid rectangle.

	sample	mean	S.D.
length	17	6.21	1.63
width		5.09	1.41
thickness		3.94	1.07

Spheroids and Pebbles (Fig. 48b-e)

A few polished, ellipsoidal waterworn pebbles were found. These were brought to the sites from a nearby river bed. When they are found stratified together with pottery, it is tempting to speculate that they were used to put on the smooth finish on pottery; otherwise their function is obscure.

Measurements oriented within the smallest enclosing solid rectangle.

	sample	mean	S.D.
length	7	2.80	1.03
width		2.38	0.90
thickness		1.79	0.91

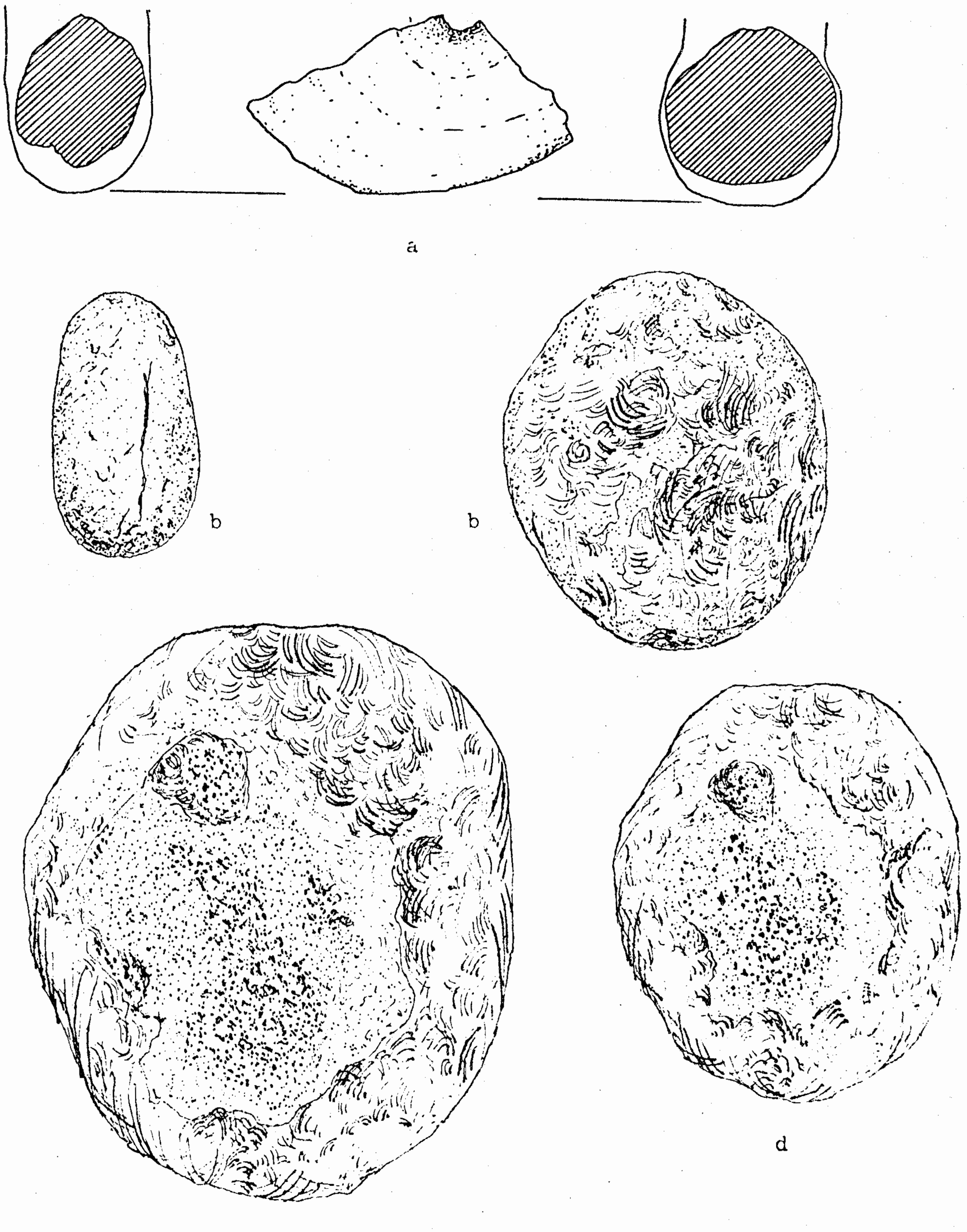


Fig. 48 Piece of bored stone a, and Polished pebble and spheroids b-d.

Lower and Upper Grinding Stones

A lower grinding stone was found at Kandaga A9. Basically it is a slab of granitoid rock with extensive polishing on one side and a shallow depression measuring about 35 cm. in the centre. It was found in stratified association with pottery and slag. In another trench was an upper grinding stone, measuring 12.0 x 9.8 x 3.3 cm.

Bored Stone (Fig. 48a)

Although no bored stones were found in any of the three sites, a single fragment made of granite was found at Kandaga A9. Bored stones have been reported from several southern African sites including Gwisho (Fagan and Van Noten 1971:95) and Nachikufu cave (Clark 1970:176) but in East Africa they are rather rare.

Sampling

During the preliminary sorting of the assemblages at the National Museum of Tanzania, it was realized that it would be impossible to ship all the artifacts and debris to Canada for detailed analysis and that some form of sampling procedure was necessary. Five broad categories, tools, possible tools, cores, flakes and debris were created after the preliminary classification. All the tools and possible tools were shipped to Canada but only a 20% random sample of the cores, flakes and debris were brought to Canada. The sampling procedure adopted was simple and straight forward. All the cores, flakes and debris from each occurrence were counted and given numbers. Where the total number of specimens exceeded 50, a table of random numbers was used to pick individual specimens until a 20% sample of the total was obtained, otherwise the whole collection was shipped. The analysis that follows is based on the 20% random sample, or on the entire sample of less than 50.

Unmodified Waste

In this heading are included cores, flakes and chips and chunks. These are also known as "waste products" i.e., those which cannot be recognized as tools and are presumably the debris left after tool manufacture (Kleindienst 1961:38). Although flakes are considered waste in this study, it should be mentioned that Mason (1967:742) has questioned the validity of treating unmodified flakes as waste, since as he argues some of the flakes may have been produced to be used without prior modification. However, many African prehistorians (e.g. Nelson 1973, Clark 1974, Fagan and Van Noten 1971) consider unmodified and unutilized flakes waste.

Cores

These are stone artifacts characterized by one or several steep and/or shallow negative scars, each of which representing a single struck-off flake, for the manufacture of tools or simply for the purpose of reshaping the core in order to

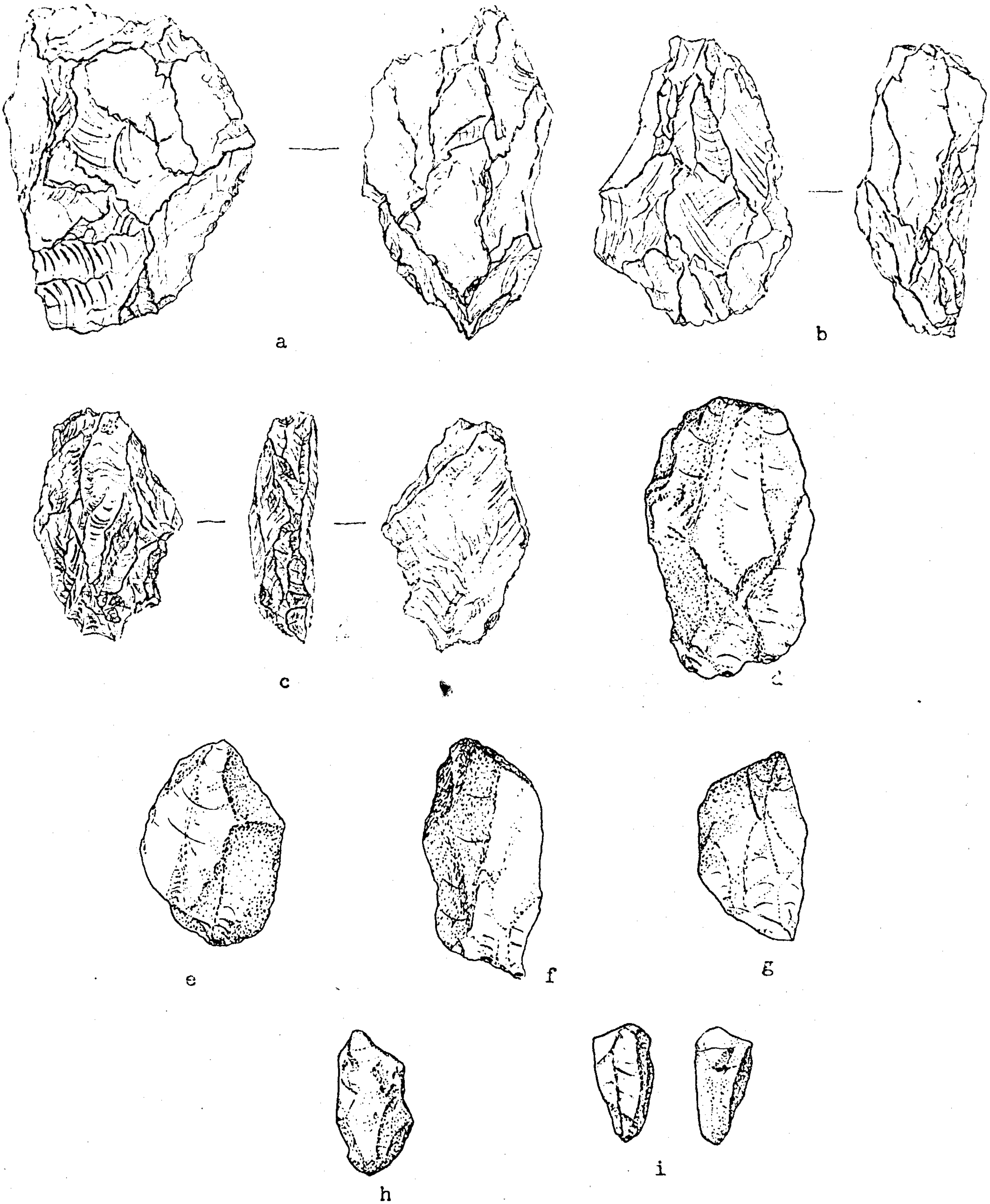


Fig. 49 Bipolar cores from Majilili 2B (a-c), Kwa Mwango (d-f) and Kirumi Isumbirira (g-i).

make it more suitable for future flakes. It is always assumed that cores were not primarily intended as tools but may later have been found suitable as tools after minimum modification, e.g. core scrapers. Cores are present in varying frequencies in East African Late Stone Age industries.

The amount of cores at any one given site is a function, inter alia, of the type of raw material, its availability and the prevailing flaking technique. Where the raw material is coarsely crystalline and/or relatively easily obtained, the relative frequency of cores will generally be found to be high; on the contrary, where the raw material is fine grained and/or not as easily obtained, simple economics dictate that cores are reduced to the minimum manageable size and as such their relative frequency is also low. In the four assemblages analyzed here, the percentage of cores as shown below is found to be highest at Majilili 2B where vein quartz is easily available and is the only material used. In terms of mean length and width, Majilili 2B also had some of the largest cores. Overall, cores constitute a fairly large percentage of the assemblages (Table 30).

Table 30: Percentage distribution of the unmodified waste in the four assemblages.

	KANDAGA A9 %	MAJILILI 2B %	KWA MWANGO %	KIRUMI ISUMBIRIRA %
All Cores	8.02	11.88	8.66	10.92
All Flakes	9.92	10.47	14.43	17.15
Debris	80.20	68.02	71.32	67.39
	98.14	90.37	94.41	95.46

In the present study the cores are classified primarily on the basis of the number of platforms and associated negative scars and secondarily on overall morphology, a taxonomic procedure also employed by Gabel (1965) and Odner (1971). No Levallois cores were identified although they have been reported to occur at Magois II (Nelson 1973:248); perhaps the only East African Late Stone Age site with Levallois cores. As was pointed out earlier, the assemblages studied are characterized by a flake rather than a blade technique, and as such blade cores are rare and far between. However a few of the bipolar cores approximate blade cores.

Bipolar Cores (Fig. 49)

These are normally characterized by two opposing platforms and may show a varying number of flake scars originating from either platform. Bipolar refers to the fact that on each core there are two opposed striking platforms or zones of percussion. These two zones are directly opposite each other with the cleavage faces on both sides of the core converging on both zones of percussion (Binford 1972:356). The flaking from both platforms is by means of percussion directe ecrasee[23] or "indirect anvil" technique (Fig. 50) which in many specimens leaves the platforms crushed and scaled. The core or pebble

[23]It was suggested at Burg Wartenstein Symposium in 1965, that in sub-Saharan Africa. "Block on block" should be replaced by the expression "sur percuteur dormant" and "direct anvil" (Bishop and Clark 1967:898). Bipolar technique is classified as "indirect anvil" in distinction to "direct anvil" (Clark and Kleindienst 1974:87).

is simply placed on an anvil and with the use of a hammer, percussion blows are directed parallel to the vertical axis of the core or pebble (Binford 1972:370; Van Riet Lowe 1974: 243), rotating it and alternating the platforms as the need may be. This technique obviously produces cores which intergrade with the _outils écaillés_, which are also probably a by product of the same technique. As MacDonald (1968:89) warns, bipolar cores may resemble _outils écaillés_, but they should not be confused with the latter because they were designed to yield useable flakes rather than to be used for working bone and wood. They are however distinguished from _outils écaillés_ by the presence of two opposed platforms from one or both of which blade/flakes have been removed, thus leaving flake scars behind. The scar pattern may show step flaking and splintering, the result of the bipolar flaking technique (Clark and Kleindienst 1974:91; Odner 1971:183).

In shape they are roughly oblong while the size is very variable, ranging from small rod-like cores to large double bi-pointed or bi-conical cores. In many specimens the flake release faces are convex and because of this the cores acquire a shape approximating a fluted cylinder. Bipolar cores make up the majority of all the cores in the 20% random sample analyzed, except at Majilili 2B where multi-platform cores are the majority (Table 30).

Binford (1972:358) distinguishes six varieties of bipolar cores; the differences between the types being the result of

> ...minor modification in the production process largely stimulated by the accidental factors of breakage and the differential cleavage properties of raw material...

The six varieties are ridge area, point area, ridge point, right angle, opposing ridge and opposing point, depending on the shape and size of the impact zone (platform).

Table 31: Percentage distribution of the different types of cores in the four assemblages.

	KANDAGA A9	MAJILILI 2B	KWA MWANGO	KIRUMI ISUMBIRIRA
Bipolar Cores	44.77	20.61	68.01	62.22
Multi-platform cores	42.61	60.11	20.20	23.01
Single platform cores	6.85	5.04	4.01	5.67
Discoidal Cores	4.82	4.21	1.00	2.01
Amorphous Cores	10.95	10.03	6.78	7.08
Total	100.00	100.00	100.00	99.99

The bipolar cores considered here may simply be said to fall into the point area and ridge area classes of Binford, i.e. those whose platforms approximate a point and those in which the platforms resemble ridges from which flakes have been struck from either side. The latter are more easily liable to be confused with <u>outils écaillés</u>. However for the purpose of this study all bipolar cores have been lumped together (Table 31).

Measurements are oriented with the long axis passing through the striking platforms.

KANDAGA A9	sample	mean	S.D.	W/L ratio %
length	134	2.88	0.88	69
width		1.99	0.73	
MAJILILI 2B				
length	94	3.57	0.73	65
width		2.33	0.88	
KWA MWANGO				
length	140	2.63	0.83	57
width		1.49	0.60	
KIRUMI ISUMBIRIRA				
length	150	3.11	0.81	67
width		2.09	0.62	

Single Platform Cores (Fig. 5.2 f-i).

These are characterized by one definite platform and circular flake scars. They may be roughly circular with flaking around part or the whole circumference. A few are pebbles split into two segments and using the split face as the platform. They are relatively rare at all the four sites.

Measurements oriented with the long axis passing through the striking platform.

KANDAGA A9	sample	mean	S.D.	W/L ratio %
length	68	3.76	1.35	71
width		2.68	0.92	
MAJILILI 2B				
length	34	4.06	1.24	71
width		2.89	1.01	

KWA MWANGO	sample	mean	S.D.	W/L ratio %
length	19	2.63	0.66	75
width		1.96	0.42	
KIRUMI ISUMBIRIRA				
length	33	2.83	0.57	70
width		1.99	0.46	

Multi-platform Cores (Fig.51, 52 d-e).

These are cores characterized by two or more platforms with flake scars distributed all over the surface. Some are polyhedral in shape, presumably resulting from alternative striking of flakes from each of the platforms formed by the intersection of the flake scars. Others are spheroidal and on these, flakes have been struck off all over the circumference without any detectable relationship with each other. Multi-platform cores constitute the second largest group just after the bipolar cores (Table 31).

Measurements oriented within the smallest enclosing rectangle.

KANDAGA A9	sample	mean	S.D.	W/L ratio %
length	82	4.09	1.78	83
width		3.39	1.55	
MAJILILI 2B				
length	73	4.35	1.78	76
width		3.30	1.24	
KWA MWANGO				
length	58	2.91	0.65	76
width		2.22	0.45	

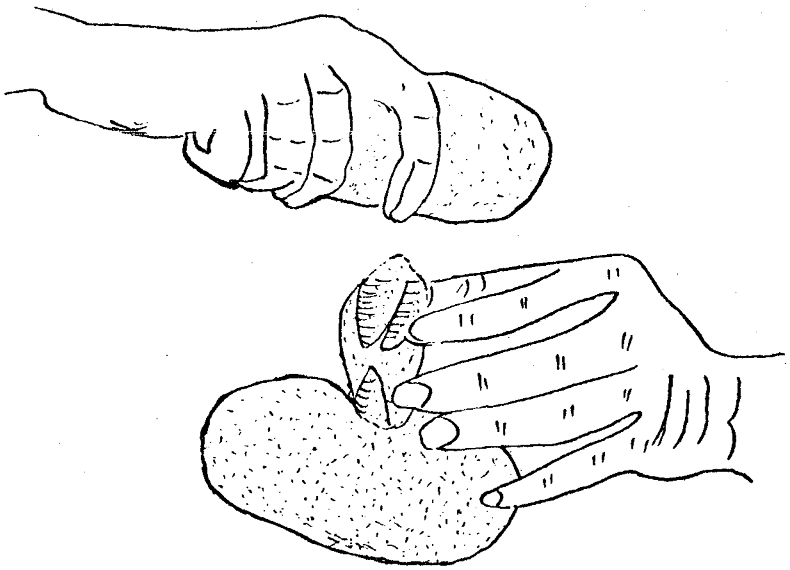


Fig. 50 Hammer and anvil as used in the bipolar technique.

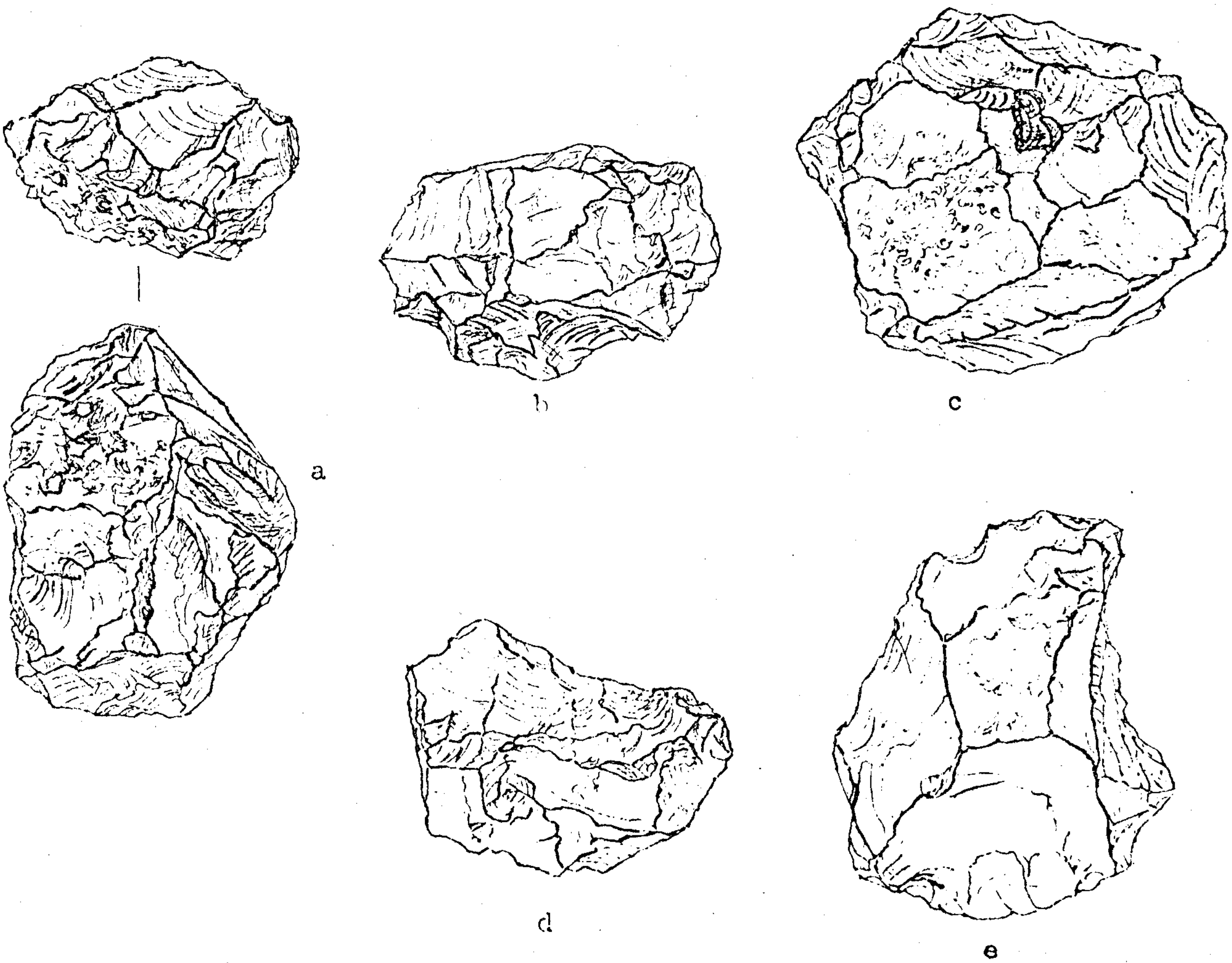


Fig. 51 Multiplatform cores from Kandaga A9 (a-b) and Majilili 2B (c-e).

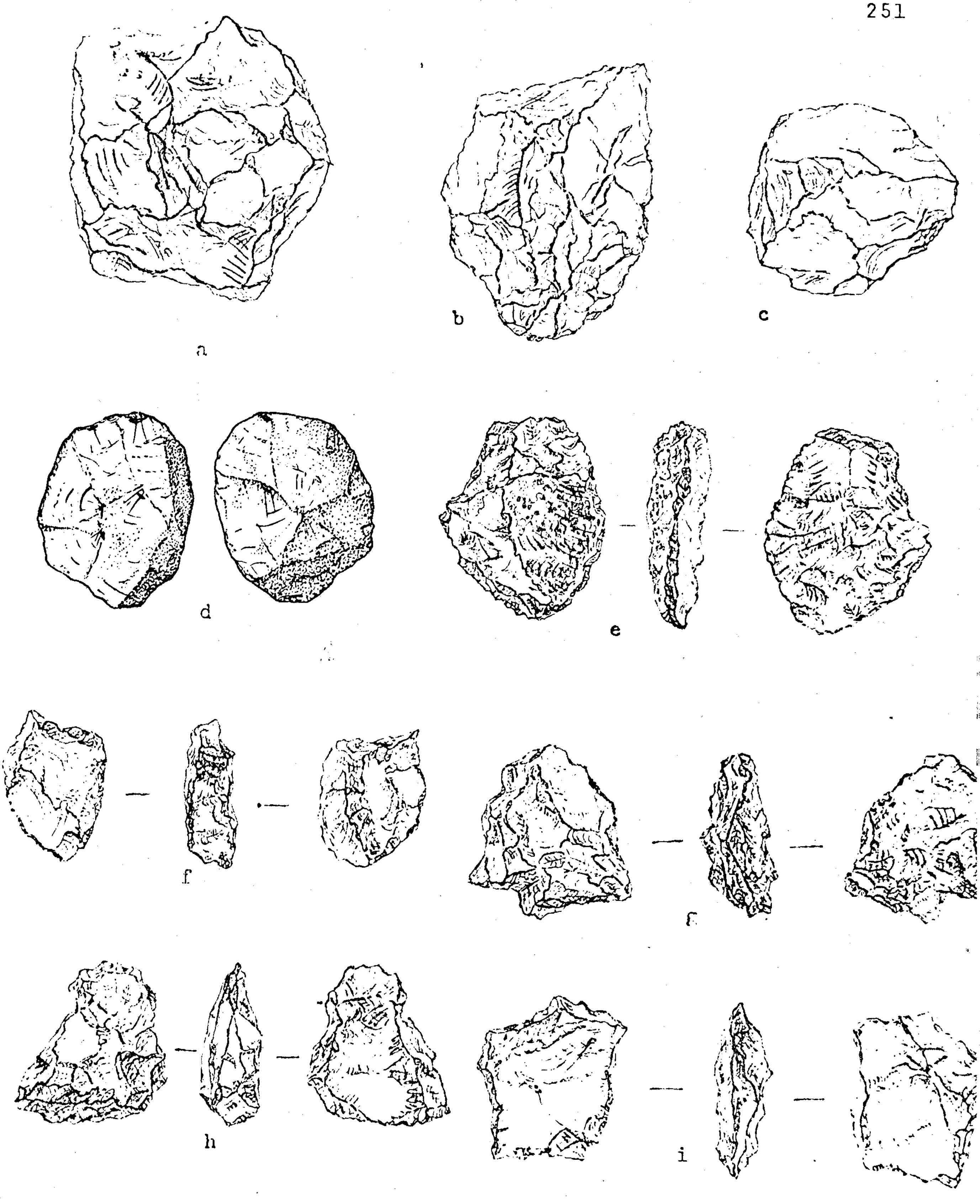


Fig. 52 Multiplatform cores a-e; from Kwa Mwango (a-c) and Kirumi Kirumi Isumbirira (d-e). Single Platform cores f-i; from Kandaga A9 (f-g) and Majilili 2B (h-i).

KIRUMI ISUMBIRIRA	sample	mean	S.D.	W/L ratio %
length	62	3.31	0.80	77
width		2.55	0.77	

Discoidal Cores

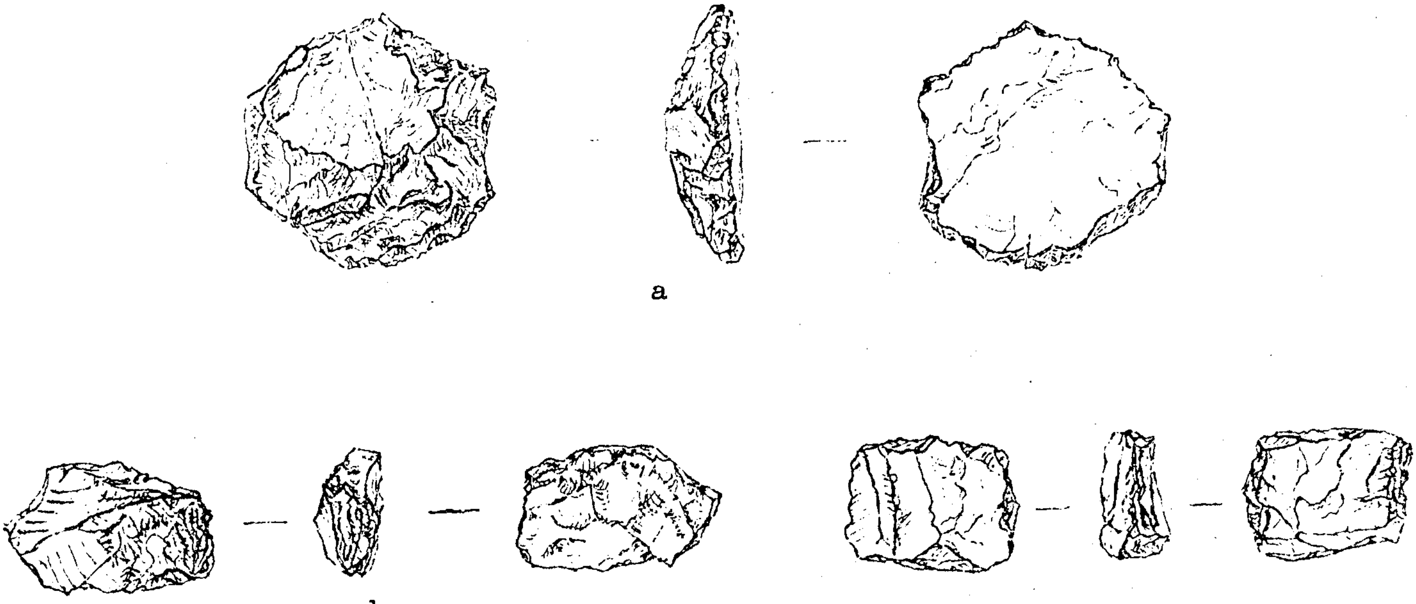
A few of the cores are roughly discoidal in shape with unidirectional or bidirectional radial flaking on both or either face. Discoidal cores are not very common in Late Stone Age assemblages (Clark 1974:130), but they have been reported by Sampson (1974, 1972) Clark (1974) and Gramly (1975).

Measurements oriented within the smallest enclosing rectangle.

KANDAGA A9	sample	mean	S.D.	W/L ratio %
length	13	5.45	1.33	90
width		4.88	1.19	
MAJILILI 2B				
length	4	7.20	1.34	90
width		6.49	1.51	
KWA MWANGO				
length	10	3.21	0.67	81
width		2.61	0.74	
KIRUMI ISUMBIRIRA				
length	8	3.04	0.75	86
width		2.62	0.56	

Amorphous Cores (Fig. 53)

These are referred to as non-regular or irregular cores by different authors. Basically, they are cores with no formal



a

b

c

Fig. 53 Amorphous (irregular) cores

orientation of the platforms, and do not seem to fall within any of the classes above. The flake removals are in different planes having been detached from any convenient side or point. In some specimens, the core is made from a flake from which a number of smaller flakes have been removed from suitable points on the flake margin. As may be expected shape and size within this class are highly variable and for this reason no measurements were taken. At any rate specimens belonging to this class are so few that measurements would have been meaningless.

Flakes and the Flaking Technique

Mention has already been made earlier that a flake industry rather than a blade industry predominated in the assemblages reported here. Nevertheless, a few of the flakes are elongated enough to be considered as flake-blades[24], but they are more of an exception than the rule. Like most Late Stone Age assemblages, the cores are dominated by small bipolar and multiplatform cores which may be considered to be the main core type source for the flakes and the tools manufactured from the latter. With the exception of Majilili 2B, all the cores seem to have been exhaustively reduced to the minimum useful size.

The flakes may be described under three headings; primary flakes, secondary or resharpening flakes and incomplete or flake fragments.

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[24]Blades are defined as flakes which are at least twice as long as they are wide. True blades also show traces of previous removals and more or less parallel edges.

Primary Flakes

A primary flake is defined as "any stone fragment struck off a core, which is unbroken and includes a striking platform" (Fagan and Van Noten 1974:78). Very few of these flakes had any cortex on the dorsal side, but this is probably due to the nature of the raw material, quartz, the cortex of which is in many cases undistinguishable unless the initial core started as a pebble. It is clear from the simple unfacetted platforms that most of the flakes were removed from striking platforms formed by the intersection of flake scars rather than from prepared platforms. The w/l ratios of the flakes as reported below would indicate that the majority are end struck. Mean length and width are more or less similar for all the assemblages except at Majilili 2B where the whole assemblage is represented by slightly larger types. The similarity in size is perhaps a reflection of more or less similar material, technique and activity patterning obtaining in the three sites.

Rejuvenation Flakes

Some of the cores were resharpened by removing the whole or part of the platform edge by a blow directed to the flaking surface, hence producing rejuvenation flakes.

Such flakes are characterized by a battered or jagged ridge on the dorsal face which represents the worked out edge of the striking platform. A very few microlithic resharpening flakes, probably produced as waste products in the manufacturing process of either tools or flakes and unsuitable for tool manufacture, were also found. Most of these have however been broken and are classified as debris.

Incomplete Flakes

These are flake fragments which although broken, had an identifiable platform and a bulb of percussion. Possible flake fragments which had lost their bulb of percussion were classified as debris. For the purpose of measurements, flake fragments were not measured unless they were near complete specimens. Measurements of all flake types are combined together.

Measurements are oriented with the long axis passing through the striking platform.

KANDAGA A9	sample	mean	S.D.	W/L ratio %
length	214	2.28	1.00	73
width		1.66	0.76	
MAJILILI 2B				
length	79	2.94	0.92	74
width		2.18	0.73	
KWA MWANGO				
length	156	2.21	0.75	66
width		1.46	0.65	
KIRUMI ISUMBIRIRA				
length	150	2.81	0.84	66
width		1.85	0.70	

Flaking Technique

The preponderance of the bipolar cores and the overall concomitant diminutive size suggest that some form of percussion technique, employing a hammer and an anvil, was used. The multi-platform cores and the other types of cores on the other hand suggest that the core was simply held in the hand and flakes struck off the appropriate points by the use of a stone hammer. The hardness of the raw material would preclude the use of a soft hammer. However, for retouching such tools as scrapers, crescents, backed flakes, etc., a pressure technique, probably employing such tools as fabricators, was used. The presence of polyhedrons with battered edges, and the whole debitage (cores, flakes and debris) taken together, would also support the direct percussion technique. It must, however be pointed out, that although it is generally assumed that the "direct anvil technique" was used in the case of bipolar cores, it is also conceivable that the same technique was used with the other types of cores especially when the latter were so small that the only way removal of flakes could have been effected would be by resting the cores on an anvil and striking at the desired angle with a hammerstone. This technique was obviously rather wasteful as evidenced by the amount of shatter or debris.

The total core/flake ratios for the whole four assemblages are 60%, 64%, 81% and 113%. This, inter alia, means that not all cores produced suitable and recognizable flakes or that some of the cores may have been carried in from somewhere else. The latter is unlikely especially in the light of the fact that the raw material used is quartz whose planes of fracture are so difficult to control that in many cases blows intended to strike off flakes might produce useless shatter instead. Perhaps this accounts for the high percentages recorded for debris in all the assemblages.

Debris

These are unretouched angular waste or shatter. They do not fall under any of the categories above. They are amorphous, sometimes comminuted and very variable in size. Some of the chunks included in this class are considered natural debris and as such the percentages recorded for debris are perhaps inflated. Other prehistorians have reported this category under the heading of "chips and chunks" (Fagan and Van Noten 1974:81).

Other Artifacts

Beads (Fig.54 f-k) As reported in the previous chapter ostrich egg-shell beads were recovered from the excavations at Kandaga A9, Kwa Mwango and Kirumi Isumbirira, while microcline feldspar beads were recovered from the last two sites.

Ostrich egg-shell beads These are small flat discs (mean diameter 0.64$\pm$0.9cm.) of ostrich egg-shell with perforation in the middle. They were recovered in three main stages of manufacture, jagged-edge, rounded discs without perforations and finally a smoother edge flat disc complete with perforation. Ostrich egg-shell beads have been reported from many Late Stone Age and Iron Age sites in East and southern Africa (e.g. Odner 1971: 192; Leakey and Leakey 1950:26-31; Clark 1970:179; Fagan and Van Noten 1971:106; Sutton 1973:97;) but they are believed to be associated with Iron Age or later Late Stone Age rather than with Late Stone Age proper. Associated with the beads are also a number of pieces of ostrich egg-shell, evidently used in the production of the shell beads.

Stone Beads Four stone beads, one from Kwa Mwango and three from Kirumi Isumbirira were recovered. Three are barrel-shaped with lengths and widths of 1.22 x 0.55 cm., 1.16 x 0.5 cm., and 0.94 x 0.31 cm. The fourth is of the shape of a flattened spheroid with a length and width of 1.00 x 0.38 cm. They are all made of microcline felspar with a very high polish. Perforations are relatively wide and with chamfered extremeties. Midway on the wall of the perforations is a slight ridge marking the junction of the bidirectional drilling.

Stone beads of this type are very rare in either the Late Stone Age or the Iron Age of East and southern Africa. The only other site known to the author where stone beads have been found is Njoro River cave in Kenya. At this site Leakey and Leakey (1950:20-31) recovered a total of over 800 beads and pendants made from semi-precious stones such as agate, quartz, chalcedony and microcline felspar. Leakey and Leakey remark that although they may have been manufactured locally, there was perhaps some foreign influence. They also think that the drilling may have been done by corrundum or

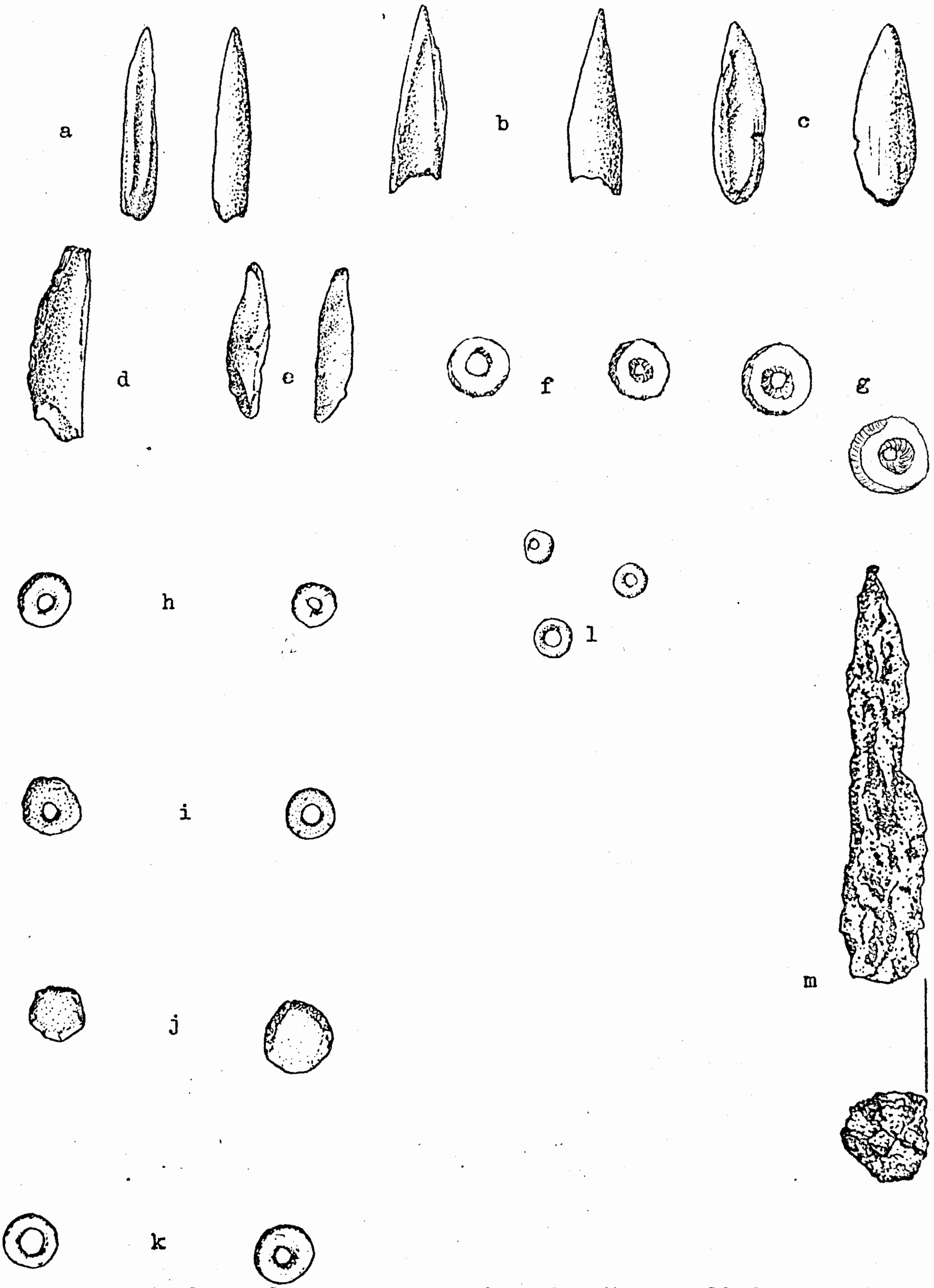

Fig. 54 Bone tools; awls a-c, scraper d, and spike e, all from Kwa Mwango. Microcline felspar beads f-g, ostrich egg shell beads h-l and iron tool (? spear) m.

emery.

Attempts by the present author to seek ethnographic explanation from the Wanyisanzu who inhabit the area around the two sites from which the beads were recovered, were unsuccessful. Until the archaeology of northern and central Tanzania is better known, it would be premature to suggest some trade connection between central Tanzania and Kenya. Testing this hypothesis requires further field evidence, and the application of laboratory analyses.

Bone implements Fig. 54) Seven awl-like bone splinters one of which had some deliberate grounding and polishing were recovered from Kwa Mwango. A scraper-like tool was recovered from Kirumi Isumbirira. Bone tools have been reported from various East African Late Stone Age and Iron Age sites (Leakey and Leakey 1950:26-31; Odner 1971:192, 1972:67; Sutton 1971:96).

Pipe Stem A small fragment (1.4 x 1.5 cm.) resembling part of the stem of a pipe and very highly polished, was found at Kandaga A9. It is probably made from soapstone or some other soft material.

Iron Implement (Fig. 54m) A piece of an iron implement possibly the tip of a spear or a hoe was found at Kandaga A9 associated with pottery and slag. It was badly rusted and because of this its proper outline was difficult to make out. It measures 6.62 cm. long and 1.5 cm. in diameter.

Summary

A complete general synthesis of the Late Stone Age of central Tanzania based on the present data is difficult to establish. However, the data analyzed here are considered complete enough to show some general trends and features characteristic of the Late Stone Age in central Tanzania. While all East African Late Stone Age industries are microlithic, they may be differentiated on the basis of the overall associated cultural components; whether they are flake, blade, or flake and blade microlithic industries; by the type of flaking and raw material; and by the predominant tool types in the constituent assemblages.

As was pointed out in Chapter 2, the data from central Tanzania suggest that Late Stone Age technology was not replaced by Iron Age technology at the time of introduction of the latter. The Late Stone Age of Tanzania is a microlithic flake industry, characterized by an abundance of geometrics, scrapers and <u>outils écaillés</u> and in which the bipolar flaking technique seems to have been predominant. In the later deposits, lithic artifacts are associated with Iron Age artifacts. In all cases the chief raw material is quartz. Comparable raw material, flaking technique and a more or less comparable level of technology, together explain why length-width means and the w/l ratios of the same artifact categories in different assemblages are comparable. These common features in spite of attendant inter-site variability, suggest that the Late Stone Age industry of central Tanzania is a definite variant within the East

African Late Stone Age industrial complex, but this is the topic of the next chapter. Suffice to say that the comparative data presently at hand, do not warrant creating any formal industry for the Later Stone Age assemblages analysed here, but an informal name is appropriate. Sufficient evidence to define, formally, an industry, is lacking; nevertheless, I propose to refer to the assemblages as Kwa Mwango industry, named after the Kwa Mwango site. The site is considered the most representative.

CHAPTER 4

THE LATE STONE AGE INDUSTRIAL COMPLEX IN EAST AFRICA

History of Late Stone Age Research in East Africa

The pioneer works of Leakey (1931, 1934, 1936) in Kenya and O'Brien (1939) in Uganda suggested a possible existence of 18 industries or phases within the Late Stone Age (Table 32-36). Later on, the research was followed by the work of M. D. Leakey (1945) and Leakey and Leakey (1950) in the eastern rift of Kenya. As attention shifted to earlier periods, especially the Oldowan and Acheulean, Late Stone Age research went into limbo and remained that way for more than a decade. The Leakeys concentrated on their work in Olduvai, while expatriate prehistorians concentrated on Acheulean sites such as Isimila and Olorgesaille. It was not until the late 1960's that there was a concerted effort to regionally evaluate the Late Stone Age. Information began to accumulate through the works of: Nenquin (1967) in Ruanda and Burundi; Inskeep (1962) in central Tanzania; Pearce and Posnansky (1963) regarding Iron Age; Sutton (1965) in the Western Highlands of Kenya; Chapman (1967), Cole (1967) on the pre Late Stone Age "Magosian" of Uganda; Gabel (1969) in the Kisumu area of western Kenya, Nelson and Posnansky (1969) at Nsongezi rock shelter, Uganda; Robbins (1969-70) at Lothagan in Turkana Kenya; Odner (1971, 1972) at Lululampembele, central Tanzania and Narosura, Kenya; Nelson's (1973) comparative

Table 32: The cultural-stratigraphic succession in East Africa according to L. S. B. Leakey (1934).

? L S A

CULTURE	GEOLOGICAL DIVISION	CLIMATE	TYPE STATION
Njoroan (1); (2) Gumban A and (3) B	Recent	Nakuran wet phase	(1) Njoro; (2) Willeys Kopje; Nakuru (3)
		DRY	
(1) Kenya Wilton "B"; (2) Kenya Wilton "A"; (3) Elmenteitan	Upper Pleistocene	Makalian wet phase	(1) Longs Drift and Elmenteita; Apis Rock (2); Gambles Cave II (3)
Magosian		DRY	Apis Rock and Magosi
Kenya Stillbay; Upper Kenya Aurignacian Phase "C"		Gamblian Pluvial	Apis Rock (Stillbay); Gambles Cave II Elmenteita (Upper Aurignacian); Little Gilgil River; Malewa Gorge Naivasha
Kenya Mousterian; Kenya Aurignacian			
Period of Rift Faulting and Great Volcanic Upheavals			
Nanyukian, Basal Aurignacian, Early Mousterian, Acheulean 6	Middle Pleistocene	Kamasian Pluvial	Top beds of Kinangop Escarpment
Acheulean 5 4 3 2 1; Chellean 5 4 3 2 1			Oldoway Bed IV; Oldoway Bed III; Oldoway Bed II
Oldowan (Upper); Oldowan (Basal)	Lower Pleistocene		Oldoway Bed I; Kanam

Note.—No attempt has been made to indicate relative duration of the geological divisions.

analysis of the Late Stone Age; and Gramly (1975) at Lukenya Hill, Kenya.

There have also been several reports from single Late Stone Age or Iron Age sites, e.g. Bower (1973), Cohen (1970), Schmidt (1973) and Sutton (1973), which together have added tremendously to the overall evaluation of the Late Stone Age in East Africa. Despite all these, the temporal and geographic distribution of the Late Stone Age is not yet completely known. To date most of the work has been concentrated in Kenya, especially the eastern rift and the western part of Kenya, and to a lesser extent, in Uganda. Tanzania on the other hand is very little known. It is therefore hoped that this dissertation will reduce the paucity of knowledge regarding the Late Stone Age in central Tanzania.

Of the earlier works, M. D. Leakey's (1945) on Hyrax Hill and Leakey and Leakey's (1950) on Njoro River cave are perhaps the most useful for comparative purposes, because for the first time the data are quantitatively presented. While museum collections from several excavations survive, these are not readily amenable to quantitative comparative analyses due to insufficient field reports and absence of a common method of sampling. Nelson, has however made use of such collections by the use of "a nested system of typological classes which can be selectively censored so as to construct the most meaningful units of comparison when dealing with partially complete assemblages" (Nelson 1973:9).

The Identification of Late Stone Age Industries

The identification of Late Stone Age industries in East Africa was so much influenced by the work being done in other parts of Africa, that a summary of the latter is considered a sine qua non for the understanding of the East African Late Stone Age industries, as proposed then.

When Goodwin and Lowe (1929) were introducing the basis of industrial classification in South Africa, prehistorians were particularly concerned with establishing the gross evolutionary pathways of prehistoric cultures as related to human evolution. Taking recourse to the stratigraphical procedures and the assumptions of palaeontology and geology, prehistoric cultures were identified on the basis of type fossils drawn from clearly recognized tools. On these assumptions Goodwin and his contemporaries proceeded with the refining of the type fossil concept with the view to applying it to continental and subcontinental areas and then working out the presumed relationships between these large geographical areas. Consequently, Goodwin (1925; 1929b; 1931) was able to speculate on the genetic relationships between the "Wilton" and Mediterranean industries, though he considered the latter inadequate for the description of African industries (Nelson 1973: 13).

Three closely related tool types were earmarked as the type fossil for the Late Stone Age:

1) small end and thumbnail scrapers;

2) a variety of large, well shaped convex scraper forms; and

3) microliths, especially crescents.

The "Wilton" industry (see later) was defined by the presence of both microliths and the small end and thumbnail scrapers. The "Smithfield" industry was defined by the presence of large scrapers and the absence of other type fossils. The presence of all the major type fossils in varying degrees was used first to assess assemblages transitional between the "Wilton" and "Smithfield" and later helped in designating the "Nachikufan" (Nelson 1973:13).

Lowe's and Goodwin's system was promptly adopted by other prehistorians without much questioning in spite of regional cultural stratigraphic and typological variability. This is best illustrated by the almost continental-wide adoption of the "Wilton" by Burkitt (1928), Jones (1949), Leakey (1931), O'Brien (1939) and Clark (1942). As a result, the "Wilton" was thought to extend from South Africa to the Horn (Sampson 1973:293; Nelson 1973:14; Inskeep 1967; Kleindienst 1967). Also based on the type fossil system of classification was the naming of the "Magosian" (Wayland and Burkitt 1932), "Howiesonspoort" (Hewitt 1928), "Nachikufan" (Clark 1950), "Kenya Capsian" (Leakey 1931), "Wilto-Tshitolian" (Nenquin 1967), "Gumban" (Leakey 1931), and "Doian" (Clark 1954). The "Magosian" industry named after type site of Magosi rock shelter in northeastern Uganda (Wayland 1926) was extended to other parts of Africa such as Abysinnia (Breuil et al. 1936) Kenya, Uganda, Zaire, parts of Zambia and

Rhodesia and South Africa (Cole 1965:201). The "Smithfield" industry has also been extended from the South African type site of the town of Smithfield to various parts of southern Africa and to western Kenya (Mason 1969:327). However, neither the "Magosian" nor the "Smithfield" illustrates the type fossil classification system as clearly as the "Wilton."

After the war the type fossil system of classification was gradually eschewed in favour of quantitative method of analysis, as the data had outgrown the number of comparative industries established by the type fossil system. The development of chronometric dating techniques also facilitated the changeover, but it should be pointed out that the system was always consciously in the background, and influenced the classification of any newly excavated assemblages. African prehistorians continued to use previously identified occurrences for any given industry as a baseline for further quantitative comparisons regardless of the geographical regions they were working in. The "Wilton" industry was adopted wholesale to cover several industrial complexes between the Cape and the Horn (Gabel 1965:3-17; Sampson 1974:292-297). This precipitated a situation in which the "Wilton" contained every conceivable item except traditionally prohibited type fossils characteristic of other industries. Thus a negative type fossil system was created in which the "Wilton" was in fact defined by the absence of certain artifacts. The result was confusion at quantitative levels of analysis in which all categories tended to take on equal importance.

The early application of quantitative methods, particularly the accumulation of frequency data for a growing number of vaguely defined types soon produced a vast amount of information susceptible to a wide variety of interpretations. Such interpretations, as argued by Nelson (1973) proceeded directly from type frequencies to interpretations with no prior critique of the typological system and without the benefit of any intermediate steps designed to test the significance of the frequencies being considered. With such plastic interpretations, coupled by the amount of variation in such spatially and typologically diverse taxa as the "Wilton", progress was brought to a virtual halt.

At the Burg Wartenstein Symposium, recommendations were generated to guide future African prehistorians (Bishop and Clark 1967:861-901). An attempt was made to revitalize the quantitative technique by introducing a hierarchical system of taxa to better cope with regional diversity. Recent prehistorians such as Miller (1969), Nelson (1973) Sampson (1974) and Gramly (1975), aware of the futility inherent in the type fossil system, have endeavoured to work within the framework of the recommendations wherever applicable. It may therefore be said that the study of the Late Stone Age is presently at the critical point in the development of a taxonomic classification.

The Wilton, Wilton Complexes and Related Industries

To demonstrate the fossil type system and how it has blurred issues in the classification of the Late Stone Age, especially in East Africa, it is necessary to describe the "Wilton" and Wilton Complex industries. Since the assemblages forming the corpus of this study would have been classified as part of the Wilton Complex according to the type fossil system, the description which follows may be contrasted with the description of the assemblages in Chapter 3.

The "Wilton Culture" was first described by Dr. J. Hewitt in 1921 as a major cultural entity in the youngest division of the Palaeolithic sequence in South Africa, the Later Stone Age. The name was formally adopted by Burkitt, Goodwin and van Riet Lowe in 1926, after the type site of Wilton rock shelter. Recent excavations and reports by Deacon (1969, 1972) indicate that the original collection was a mixture of probably four recognizable states of development within a single lithic tradition. The assemblages were not homogeneous, rather they were a complex series of stylistic changes covering some 6,000 years (Sampson 1974:293; Deacon 1972:15).

In spite of the unprecise description of the assemblages from the type site, other workers adopted the name to report typologically similar aggregates not only in South Africa, but as far afield as central and eastern Africa. Goodwin for instance suggested that the "Wilton" might be present in several parts of South Africa, South West Africa, Botswana, and the

Matopos Hills, Rhodesia. Burkitt (1928) extended the spread of the "Wilton" to Kenya and Uganda, while Jones (1949) adopted the term for Rhodesian assemblages, and Clark (1942, 1954a) for Mumbwa cave, Zambia and Somalia respectively; Leakey (1931; 1936) used it for industries in Kenya and Tanzania, and O'Brien (1939) used it in Uganda, thus making the "Wilton" the most widely spread single industry (Sampson 1974:298). None of these reports attempted a detailed numerical comparison between the local Wilton sample and that from the type site. All that can be said is that all the published samples share several typological features to render them comparable at the technocomplex level.

Even in South Africa alone, there are stylistic differences between Wilton sites from South West Africa and those from southwestern Cape. Sampson (1974) distinguishes at least seven Wilton and Wilton-related industries; the Coastal Wilton, the Interior Wilton, the Matopan Industry, the Pfupian Industry, the "Zambian Wilton" and the Nachikufan Industry. Only the coastal Wilton will be described in detail.

Coastal Wilton:[25] Type site; Wilton Shelter

The tool kit is characterized by an abundance of microliths made from microblades and small flakes. The Coastal Wilton is divided into four tentative phases - Early, Classic, Developed and Ceramic based on tool type fluctuations through time.

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[25] The present author has made no attempt to specify Sampson's inconsistent usages of formal versus informal terms.

a. The Early Phase: It is recognized by the presence of relatively abundant large side scrapers and core hammers. It may also be characterized by a relatively high frequency (ca. 30% of all tools) of large utilized flakes without formal design. Small convex scrapers, small side scrapers, small circular scrapers, outils écaillés and scarce (about 5%) backed microliths, occur but in relatively low frequencies. Grindstones, reamers, bored stones, cylindrical bone points, bone awls, mattocks, tubes, beads, shell pendants and ostrich egg-shell beads may also occur. (Sampson 1974:298).

b. Classic Phase: This differs from the preceding phase in the numerical proportions of a few tool types. Large heavy scrapers and large utilized flakes are scarce or completely missing. On the other hand, there is an increase of small convex scrapers (about 30-40%), small side scrapers, circular scrapers and backed adzes. The backed microliths now make up between 15 and 25% of all the tools with a wide range of forms represented. Overall, there is a decrease in the dimensions of all types of scrapers.

c. The Developed Phase: It is recognized by a trend towards manufacture of large side scrapers, large utilized flakes proliferate as do core scrapers, core choppers and serrated pieces. Backed microliths remain, but in some assemblages the backed crescent may be entirely absent. In short the Developed Wilton reflects a breakdown in the homogeneity of design shown by the Classic Phase assemblages.

d. The Ceramic Phase: This refers to the later Developed Wilton which in addition of stone artifacts has potsherds (Sampson 1974:298-302).

In addition to the lithic and ceramic features of the Coastal Wilton, a sizeable bone working tradition represented by such artifacts as ground mattocks, adzes, digging sticks, spatulas, club headed pins, bone beads, and bone tubes persists throughout the phases.

Chronology

C14 dates for the Coastal Wilton range from 7750±300 B.P. to as late as 90±50 B.P. (Sampson 1974:309-310).

In addition to the Coastal Wilton, an Interior Wilton variant has been described from parts of South and South West Africa, but only in the Orange River scheme are the data sufficient to reveal the detailed development of a Wilton-related industry. The Interior Wilton is also divided into four phases; Early, Classic, Developed and Ceramic phases. The Classic and Developed phases are largely microlithic. The chronology of the Interior Wilton overlaps with that of Coastal Wilton but fails to survive into the historic period (Sampson 1974:322-332).

In Rhodesia, Cooke, et al (1966), proposed the term Matopan

Industry to describe another Wilton-related industry hitherto called "Southern Rhodesian Wilton." Cooke (1957b) postulated a three phase development of the Matopan; Matopan, Matopan Pre-ceramic and Matopan Ceramic. The tool types and chronology suggest that the Matopan is contemporary with and related to the South African Coastal Wilton, hence its inclusion in the Wilton complexes (Sampson 1974:332-336). To the north and east of the Matopan Industry area are a sparse scatter of Wilton-related finds which Cooke, et al (1966) has termed the Pfupian Industry. The delineation of a separate industry based on geographical distribution and a few presumably distinctive tool types has been questioned by Sampson (1974:337) because not only the supposedly distinctive tool types (ground stone axes, bored stones, double backed crescents, geometric microliths and small bifacial points (not consistently found at the sites, but the data so far obtained is not sufficient to create a separate industry. At all sites, the Pfupian Industry underlies an Iron Age occupation and is contemporary with the Matopan to the south and west (Sampson 1974:337-339).

Further north is the "Zambian (North Rhodesian) Wilton", described among other sites, from Mumbwa Cave (Clark 1942, 1952), Gwisho Springs A & B (Gabel 1963, 1965; Fagan and Van Noten 1974) and Nakapapula (Phillipson 1963). The assemblages show considerable inter-site typological variation which according to Sampson (1974) masks any clear evidence of stylistic changes throughout time. In contrast, however, Clark (1950:

107) does not only suggest a two phase division, an Earlier Phase (lithic) and a Later Phase (ceramic), but he states that the Mumbwa Industry shows clear affinities with the Matopan ("South Rhodesian Wilton") to which it may be ancestral. Several C14 dates for the Zambian Wilton suggest a time span of about 5,000 years, ranging from 5430±140 B.P. to 465±85 B.P., and thus overlapping with dates obtained for South African Coastal Wilton.

The Nachikufan Industrial Complex from north Zambian sites of Nachikufu cave, Nsalu and Bimbe (Clark 1950c, Miller 1969) is however considered distinct from the Wilton Complex industries on the basis of tool types and its overall time span. Three main phases (Phase I, IIA & IIB, III) have been distinguished and cover a time span of more than 12,000 years (Clark 1974: 140-141), although Sampson (1974:356) has reported two dates of 16,400±265 B.P. and 21,500±950 B.P. both from Leopard's Hill. The microlithic technique seems to have been most prevalent at the time of Phase IIB dated to the seventh millenium B.P. while the later stages of Phase III have geometric microliths associated with pottery (Miller 1969:505; Clark 1974:141; Sampson 1974:354-356). Analysis of the Nachikufan data raises several points. First is the presence of a microlithic industry in northern Zambia prior to 7000 B.C. and possibly extending as far back in time as about 16,000 B.C. at Nsalu, Leopard's Hill. Such extreme antiquity may be related to the "Magosian" or to the Palungu Industry at Kalambo Falls. However at Kalambo

Falls, the Polungu has been dated to only 9,550±210 B.P. and therefore falls midway between Phase IIA and IIB (Clark 1974: 155, Sampson 1974:359). On the other hand, the preceding industry in the "Zambian Wilton" seems to be the "Stillbay." The Nachikufan is therefore not ancestral to the "Wilton" in Zambia.

Secondly, Phases II and III of the Nachikufan Industrial Complex display close resemblances to the "Zambian Wilton" with its proliferation of backed crescents and scrapers, although Nachikufan Phase IIA dates may still be older than the earliest Wilton samples. Phases IIB and III display a striking resemblance to the Pre-ceramic and Ceramic phases of the "Zambian Wilton."

Thirdly, Phase III may be regarded as a continuation of the complex range of Phase II assemblages after the time of the first Iron Age contact (Sampson 1974:360).

The Nachikufan and Wilton Industrial Complexes are also represented in Malawi especially from the sites of Fingira (Robinson and Sandelowsky 1968a), Mphunzi Shelter (Miller 1971), Hora Mountain cave (Clark 1956), Chowo (Miller 1969b), Mabande Court and Chaminade (Clark 1967b). Both Pre-ceramic and Ceramic stages have been recognized. The C14 chronology ranges from 4080±100 B.P. to 2125±120 B.P. and places the samples in the range of Pre-ceramic Wilton or contemporary with Nachikufan Phase IIB (Sampson 1971:361).

The origin and proliferation of the Wilton-related microlithic industries is not easy to explain. The Howiesonspoort Industry characterized by straight backed blades, curved backed knives, trapezes and obliquely backed pieces slightly larger than any of the equivalent shapes found in the Coastal Wilton assemblage was in existence about 20,000 years ago (Sampson 1974:365). By 16,000 B.C. knowledge of these tools seems to have disappeared and did not appear again until the time of the Oakhurst Industry. The latter seems to have phased out into the Wilton as microlithic types began to appear and therefore the Oakhurst Industry is the most likely ancestral candidate of the Coastal Wilton. In the interior of South Africa and Rhodesia, no industry has yet been identified as ancestral to the Wilton and the Matopan. Farther north the Nachikufan was already microlithic between 14,000 and 7,000 B.C. By 7,000 B.C. Phase I had given rise to Phase IIA whose artifact types are similar to the "Zambian Wilton", Pfupian and the early phases of the various Wilton industries to the south. It would therefore appear that the microlithic technique was introduced from northern Zambia and by 6,000 B.C. had been adopted by the Oakhurst Industry in the Southern Cape Coast (Sampson 1974: 366-367). As for the proliferation, it is tempting to postulate not only diffusion of ideas, but actual movement of people. The limited research so far done shows that basic craniometric comparisons indicate that the Cape Coast and the Zambian Wilton skeletons display a similar range of head shapes, but both differ markedly from the Oakhurst populations at Matjes River. "If a southward migration of a mainly dolichocephalic racial stock brought the Wilton into South Africa, adequate supporting evidence for such an event is lacking" (Sampson 1974: 367). More data is needed before any theories can be advocated. The evidence is more concrete as regards the introduction of Iron Age technology. This was introduced by southward moving groups of peoples perhaps as early as A.D. 200 as reflected by "the Ceramic phase of the whole Wilton complex" (Sampson 1974:367).

The appearance of the Wilton in central and southern Africa is also associated with rock art. In some of the shelters with rock art, e.g. Chifubwa Stream, Nakapapula, and De Hangen, the walls are buried by cultural deposits. Painted slabs in deposits, e.g. at Matjes River and painted shelters with only Wilton deposits are found at Nachikufu, Nsalu, Riversmead, Blydefontein and Wilton. It has been suggested that many of these paintings were executed by the Wilton groups (Clark 1970, Sampson 1974, Willcox 1963, Rudner and Rudner 1969).

The preceding section is a brief summary of the Wilton and Nachikufan Industrial Complexes in central and southern Africa. Needless to say, the cultural history of the Nachikufan-Wilton is itself complex and confusing. The same complexity and confusion is seen in the East African Late Stone Age industrial complex, but here the complexity takes the form of a proliferation of ill-defined industrial taxa recognized on the basis of a few type fossils and geographical distribution.

Identification of Late Stone Age Industries in East Africa

The identification of Late Stone Age Industries in East

Africa has involved a larger number of type fossils and formally recognized taxa than any other area in sub-Saharan Africa. This is partly a reflection of the biases of the early prehistorians and partly due to the great diversity within the Late Stone Age. It has been suggested by Hance (1964)and Nelson (1973) that the diversity observed within the Late Stone Age of East Africa is related to the complex and diverse ecological zonation which characterizes East Africa, and that the differentiation of material culture apparent during the Late Stone Age may provide an indirect measure of this diversity (Nelson 1973:20).

The taxonomic parameters of the Late Stone Age in East Africa were first worked out by L. S. B. Leakey (1929; 1931; 1934; 1936; 1945) (Tables 32, 33, 34). Initially, the taxa and cultural stratigraphic succession were based on a few sites in the eastern rift, but they were later extended to other parts of Kenya and even northern Tanzania, while O'Brien (1939) tried to apply the same model with minor modifications to Uganda (Tables 35, 36). Leakey recognized eight major industries which are now considered to fall within the Late Stone Age, viz. "Kenya Aurignacian," "Elmenteitan," "Kenya Wilton," "Magosian," "Gumban," "Njoroan," "Tumbian" and "Kavirondo Smithfield." In Uganda, Wayland (1931) and O'Brien (1939) named five industries; "Tumbian," "Magosian," "Kageran," "Wilton-Neolithic A" and "Wilton-Neolithic B." (O'Brien 1939:205-291). The "Tumbian" as will be shown later on, antedates the Late Stone Age. The cultural stratigraphic succession of East African prehistory was based on the pluvial model, but the re-evaluation of the model has demonstrated the dangers of correlating occurrences on the basis of inferred climatic sequencies (Flint 1959). The early dates which have not been verified by chronometric dating are questionable.

"Kenya Aurignacian." It was first identified at Gamble's Cave and Nderit Drift (Leakey 1931:90-93). It was divided into "Lower" and "Upper Kenya Aurignacian" on the stratigraphic basis of being prior to or after the Upper Gamblian pluvial maximum. The "Lower Aurignacian" was not properly defined in terms of artifact content, but it was thought to consist almost entirely of backed bladelets and very few end scrapers. As it developed to "Upper Kenya Aurignacian," burins began to appear. The "Upper Kenya Aurignacian" was further divided into three arbitrary phases, "a", "b" and "c," based on tool types. Overall it was defined by a series of type fossils which included a variety of large end and end-of-blade scrapers, backed blades, Chatelperron and Gravette points, burins, microburins and fabricators (Nelson 1973:21).

Recent examination of the "Kenya Lower Aurignacian" occurrence at Nderit Drift by Isaac (1970) shows that the occurrence overlies an earlier Late Stone Age horizon associated with C14 dates clustering around 12,000 B.C. On the other hand, the lowest levels of the "Kenya Upper Aurignacian" are associated with C14 dates in the eighth millenium B.P. Later, Leakey (1942) identified another occurrence at Naivasha rock shelter which he called "Kenya Aurignacian Mesolithic phase" which had pottery. Although no C14 dates have been obtained for this site, stratigraphy and limnological evidence suggest a date between 5000-3000 B.P. (Nelson 1973:25). The "Kenya Aurignacian" was later renamed "Kenya Capsian" (Leakey 1947a, Cole 1963).

"Elmenteitan." The "Elmenteitan" was described from deposits overlying the "Upper Kenya Aurignacian" at Gamble's Cave, and as such has been considered a direct derivative of the "Aurignacian" (Leakey 1931; 1936:67-68). It was defined by the presence of pottery, microliths and large, casually retouched blades, the dimunition of backed blades, and the replacement of large platform removal flakes and outils écaillés. The "Elmenteitan" differs from the "Kenya Capsian" in the following:

1. Long two-edged blades were used as knives instead of the "Kenya Capsian" backed blades.
2. The principal fabrictors of the "Elmenteitan" were lames écaillées instead of the triangular section fabricators of the "Kenya Capsian."
3. Decorated pottery from pots and bowls occurs in abundance. (Leakey 1936:67-68). The only occupational sites of the "Elmenteitan" are cave or rock shelter sites.

"Wilton." The "Kenya Wilton" was first identified from the Makalian deposits overlying the Gamblian deposits at Long's Drift and characterized by crescents and thumbnail scrapers (Leakey 1931: 1976-1977). Later it was divided into three separate industries designated "A", "B" and "C." "Wilton A" was thought to be associated with open sites as per the type site of Long's Drift and characterized by the presence of a large number of small double-headed thumbnail scrapers, crescents and a few burins and fabricators of the lame écaillées type. It was considered an intrusive industry related to the "Wilton" of Rhodesia (Leakey 1936:68-69, Nelson 1973:27). Wilton B was identified from Apis Rock in Tanzania and thought to be associated with rock shelter sites. Although like "Wilton A," it has thumbnail scrapers and crescents, it was differentiated from the 'A' type by the presence of small degenerate points of the "Stillbay" type. It was therefore thought to be a direct derivative of the "Stillbay-Magosian complex" (Leakey 1936:68). "Wilton C" was never fully described but was at first thought to be an expansion of "Wilton A." However, it was later separated from "Wilton A" by the near absence of flaked stone artifacts, especially thumbnail scrapers, the presence of coarse pottery, site location along the shores of East African lakes and its association with shell middens or 'escargatoires'. (Leakey 1936:69; Nelson 1973:27).

In Uganda the "Wilton" was confused with the "Magosian" and not clearly defined. Burkitt studied the cultural deposits at the granite cistern sites at Magosi, and thought the material showed affinities with some "Stillbay" tools while others resembled a form of crude "Wilton." He therefore suggested that the "Magosian" was a form of "proto-Wilton". He also suggested that the industry might have been the result of contact between the terminal stage of "Stillbay" and "Early Wilton". This view was also shared by O'Brien (1939). O'Brien also thought that the material described as "Magosian" was an admixture of "Stillbay" and true "Wilton" of the same age (O'Brien 1939:260-261).

In addition, O'Brien identified three other industries which he considered of Neolithic Age: the "Kageran", "Wilton-Neolithic A" and "Wilton-Neolithic B", the last two of which are microlithic. The temporal sequence was described from two sites. At Nsongezi, the "Kageran" was followed by the "Wilton-Neolithic A", while at Walasi open site, the "Stillbay", a late "Magosian"-like industry, was succeeded by the "Wilton-Neolithic B". (O'Brien 1939:268).

"Kageran." This industry was first discovered by Wayland and named after the Kagera River on which banks it was found. It was identified again at Nsongezi. In both sites, it immediately preceded a microlithic industry. It was reported as being an unspecialized industry of fairly large tools consisting of cores, choppers, and chunk and flake scrapers made from blue quartzite (O'Brien 1939:268-269). The existence of the "Kageran" industry is now disputed following the re-excavation of the Nsongezi rock shelter (Nelson and Posnansky 1971) which failed to reveal any evidence for the "Kageran" industry.

"Wilton-Neolithic A." This was named by O'Brien from Nsongezi rock shelter. It was microlithic, and at first O'Brien thought it was a form of the "Gumban" in Kenya, but the absence of polished tools, stone bowls, querns and pottery in the lower levels precludes any close relationship with the "Gumban". The presence of thumbnail scrapers together with lunates, backed blades and end-side scrapers suggested a "Wilton" tradition.

"Wilton-Neolithic B." This variant was named from Chui cave near Mt. Elgon. Unlike "Wilton-Neolithic A", there were burins, a number of large stones with various signs of use and the lack of backed blades and pottery. O'Brien suggested that the "B" variant of the "Wilton-Neolithic" approached the "Gumban B" of Kenya more clearly than the "A" variant, but the absence of pottery, bowls, and querns and the presence of burins differentiated the two. Like "Wilton-Neolithic A", the presence of thumbnail scrapers was the distinguishing mark. The letter designations "A" and "B" do not denote any temporal distinctions. (O'Brien 1939:271-272).

"Magosian." The Magosian was first identified by Wayland (Wayland and Burkitt 1932) at Magosi in Uganda and adopted by Leakey to describe a cultural industry intermediate between the "Stillbay" and "Wilton". It was described as consisting of small bifacially flake points, microliths and pottery, but lacked firm evidence for the Levallois technique (Leakey 1936: 66-67; Nelson 1973:28-30). The status of the "Magosian industry" in eastern and southern Africa has changed following the re-analysis of Magosi by G. Cole (1967), although the tool types characteristic of the "Magosian" as given by S. Cole (1965:202) would place the Magosian in the Late Stone Age rather than within the Second Intermediate. The identification of possible

Second Intermediate industries in East Africa has been reduced to a handful of occurrences, including the lower deposits at Magosi, the lower levels of Muringa rock shelter and long sequences at Apis Rock (Nelson 1973:28). The "Magosian" at Apis Rock is presently being restudied by Mr. Mehlman of the University of Illinois at Urbana.

In Uganda as pointed out earlier, the "Magosian" was first regarded as a transitional stage between "Stillbay" and the "Wilton." Later it was seen as a fusion of the "Kenya Capsian" and "Stillbay" which gave rise to the "Wilton." The interpretation was more or less similar to that made by Leakey for the Kenya sequence (Nelson 1973:35). The "Stillbay-Magosian-Wilton" sequence in Uganda was later reinterpreted by O'Brien (1939). He regarded the "Magosian" as a fusion of an early stage of the "Wilton" with a variant of the "Stillbay" which had been influenced by the "Kenya Aurignacian," an industry he referred to as the "Kenya Capsian" (O'Brien 1939:260-262).

The Sangoan was renamed "Tumbian" and subdivided into several stages, the latest of which contained small percentages of crescents and judged to be contemporary with the "Magosian." However, as Nelson (1973) points out, O'Brien's "Late Tumbian" was based on surface collection and the primary association of the tool types is doubtful. Nelson's (1973) analysis indicates that the "Tumbian" is older and different from the Late Stone Age occurrences at Nsongezi rock shelter, Kantsyore Island and Nyabusora rock shelter (Nelson 1973:37).

"Gumban". The "Gumban" together with the "Njoroan" cultures were considered by Leakey (1931) as "Neolithic cultures". However the Neolithic as a cultural succession concept in sub-Saharan Africa has now been abandoned (Clark 1967) and as such has no formal taxonomic validity in East Africa either. The "Gumban" is characterized by stone bowls, clearly defined pottery traditions, grindstones, polished axes, ground beads, bone tools, cairn burials, and the practice of cremation (L. S. B. Leakey 1931; 1936; M. D. Leakey 1945, Leakey and Leakey 1950; Sutton 1970; Nelson 1973). The "Gumban" as suggested by Leakey may indicate some sort of agriculture and possibly associated with the introduction of stock (Sutton 1970). Flaked tools include small backed blades, crescents, scrapers, and very crude burins. However, these are very variable from occurrence to occurrence and include many of the type fossils characteristic of the "Kenya Upper Capsian", "Elmenteitan" and "Wilton A" (Nelson 1973:30).

Initially, Leakey (1931) divided the "Gumban" into two industries, "Gumban A" and "Gumban B" based on the assumption that 'B' was later than 'A', but as Sutton (1970) has pointed out, the whole concept of "Gumban B" is based on a confusion of Late Stone Age burials with Late Iron Age "Sirikwa Holes" and their class C pottery. Other subdivisions were added as more sites were found so that by 1945, Leakey referred to the "Hyrax Hill variant", "Njoro River Culture" and various other branches of the "Stone Bowl Culture", as "Gumban". All these single site assemblages and industries have now been abandoned in favour of Stone Bowl Cultures (Cohen 1970; Bower 1973; Nelson 1973, Mturi n.d.), but the term should be 'industry'. While Brown (1966) and Cohen (1970) have denied the association of "Gumban A" pottery with Stone Bowl Industries, Bower (1973) has shown that "Gumban A" pottery is in fact found in association with Stone Bowl Industries. Stone Bowl Industries have now been reported in addition to the Kenya Highlands and the Kenya rift, from Western Kilimanjaro, Ngorongoro and Seronera in northern Tanzania (M.D. Leakey 1966; Sassoon 1969; Bower 1973).

"Njoroan." The "Njoroan" was described by Leakey (1931) based on a number of polished axes associated with graves at Njoro. The presence of polished axes was regarded as evidence of a Neolithic date. Failure to find more polished axes in primary stratigraphical context led M. D. Leakey (1945) to suggest that the term be dropped. Subsequent research has shown that the stone axes are associated with stone Bowl Cultures (Nelson 1973:31).

"Tumbian." The "Tumbian Culture" was first named by Menghin (1925) after the site of Tumba in the Congo and fully described by O'Brien (1939) in Uganda. The name was later adopted by Leakey and Owen (1945) to describe a Lupemban-like industry found in the North Kavirondo region of Western Kenya.

The "Uganda Tumbian" according to O'Brien (1939:205-259) is a long-lived complex descended from the Lower Palaeolithic Acheulean and lasting until Neolithic times as evidenced by polished tools. He identified four subdivisions, the "Uganda Proto-Tumbian", "Middle Uganda Tumbian", "Upper Uganda Tumbian" and "Late Uganda Tumbian".

The "Proto-Tumbian culture" was described from the upper levels of the N-Horizon of the Kagera Valley. Its characteristic tools are large clumsy stone flaked hand-axes and picks, a number of small cores and core choppers. As such therefore, the typology does not conform to the type fossil characteristic of the Late Stone Age.

The "Middle Uganda Tumbian" was described from the Kagera 100 foot terrace but none of the artifacts seem to have been found in primary stratigraphic context although most of them were reported as being in mint condition. The characteristic tool types include picks, hand axes, cleavers, large and small tranchets, overal, pointed parallel-sided and tapering varieties of leaf-shapes, points, scrapers, core choppers, cores and flakes (O'Brien 1939:211-215). Obviously, this industry is more of a developed or Upper Acheulean nature and therefore of no importance in the analysis of the Late Stone Age.

The "Upper Uganda Tumbian" was identified from rubble collections from Bugungu plateau. It was suggested (O'Brien 1939) that the Bugungu Tumbian culminated in contact with the "Late Levallois" to produce the "Early Stillbay." The tool types were not described but mention is made of the presence of a "Levalloisian biface technique."

The "Late Uganda Tumbian" is best represented in Orchinga Valley. The composition of tools is given by O'Brien (1939: 16) as Tranchets - 71%, Points - 18%, Crescents - 1%, Hammerstones - 3% and Cores - 7%. None of these tools was found *in situ*.

In Kenya, Leakey and Owen (1945) divided their "Tumbian" into five stages which Leakey correlated with the pluvial sequences in the eastern rift. He assigned the "Upper Tumbian" a post-Pleistocene age contemporary with the "Elmenteitan" and the "Hyrax Hill variant" of the "Gumban," on the basis of presumed correlation with the Makalian wet phase. However, a post-Pleistocene date is unlikely in view of the present knowledge of climatic correlation, stratigraphic anomalies which have been detected in the north Kavirondo sequence, and the fact that the "East African Tumbian" refers to a set of industries of Sangoan and Lupemban affinities, which contain none of the type fossils characteristic of the Late Stone Age (Nelson 1973: 31). Since then the term "Tumbian" has been officially discarded and replaced by Sangoan in East Africa (Leakey 1947b: 8; Cole 1963:51).

"Smithfield." References to the existence of an industry similar to the "Smithfield" of South Africa in the Nyanza Province are cited by Leakey and Owen (1945:56) and Cole (1963:197). Not only is there no published account of the industry, but recent work by Gabel (1969) shows that all the Late Stone Age occurrences in Western Kenya are of the Wilton type.

Conclusion Nelson (1973) has made the following remark about the Late Stone Age of East Africa:

> ...Very little has been done to alter the basic taxonomic frame work since 1945. Assemblages having a substantially different character than those already described did not

emerge until after the critical re-evaluation of industries conducted at Burg Wartenstein. As a result, new industrial taxa have been avoided... (Nelson 1973: 32).

1. As already pointed out, most of the work was concentrated especially in Kenya and to some extent in Uganda. It was assumed, sometimes without any evidence, that similar cultural and stratigraphic succession would obtain in other parts of East Africa.
2. Not only were the recognized post-Pleistocene industries based on an inadequate number of type fossils, and insufficiently described for quantitative comparisons, but some of them, e.g. the "Tumbian", "Stillbay" and possibly "Lower Magosian" antedate the Late Stone Age and are therefore of little importance in the analysis of the Late Stone Age.
3. Some industries, e.g. the "Wilton" have been so uncritically accepted by African prehistorians so that the subcontinental spread of the "Wilton" is now being questioned.
4. The Stone Bowl Industries are the only adequately described Late Stone Age industries. The "Upper Kenya Auriganacian" (or "Kenya Capsian"), "Elmenteitan", and "Kenya Wilton A" have been evaluated by (Nelson 1973) but due to the temporal and geographic variability, he has declined suggesting any specific industrial taxa until more regional data are available. At the

time of writing Nelson is back in the field collecting and analysing data to study variability within the Late Stone Age in East Africa.

Comparison of the Four Assemblages

Assemblages or industries may be compared under several headings, but in the present analysis only three; temporal, inter-site (geographic) and intra-site comparisons are considered. Nelson's (1973) careful study of various museum collections and 31 occurrences from 14 sites failed to disclose any repetitive patterns in the flaked stone artifacts from any of the Late Stone Age assemblages. Temporal and geographic variability will be discussed with reference not only to the data forming the corpus of this study but also data from other central Tanzania and selected East African Late Stone Age sites.

Temporal Comparison

Available C14 dates bracket the beginning of the East African Late Stone Age between 20,000 and 15,000 years B.P., while persisting Iron Age artifacts found in association with flaked tools would suggest a terminal date of about 1,000 years B.P. or even later (Nelson and Posnansky 1970; Sutton 1968; M. D. Leakey 1945). However, according to Nelson (1973), although the dated East African Late Stone Age assemblages are scattered over a period of 20,000 years, more than 50% of the sites fall between 1,000 and 3,000 B.P. (Fig. 55). Table 37 shows some 43 dated Late Stone Age occurrences in East Africa and although there is a wide temporal range (19,000± 1,270 of 200 B.P.) the majority of the dates can be seen to fall between 1,000 and 3,000 years B.P. The older occurrences of over 16,000 years B.P. from Lukenya, Olduvai, and Kisese II are associated with archaeological deposits which have been considered either transitional to or early Late Stone Age (Nelson 1973; Inskeep 1962; Gramly 1975). Overall, the industries are less microlithic than later occurrences and may be exceptionally rich in scraper forms as at Kisese II. The earlier date at Prolonged Drift Stratum 1, on the other hand, is not associated with any archaeological deposits (Nelson 1973: 124), and therefore of no significance in this analysis.

The duration of the Late Stone Age alone, not to mention the geographic spread of Late Stone Age occurrences, therefore poses serious problems of comparative analysis. In the case of the assemblages studied here, the problem of duration is less serious than that of the whole of the Late Stone Age industrial complex. Assuming that the C14 dates quoted in Chapter 2 are reliable, the duration of most of the assemblages in central Tanzania lies roughly between 16000 and 200 B.P. However since the modern dates (200 B.P. or less) were associated with a large number of Iron Age deposits, they do not properly represent the antiquity of the Late Stone Age in central Tanzania. In the present comparison, the five central Tanzania Late Stone

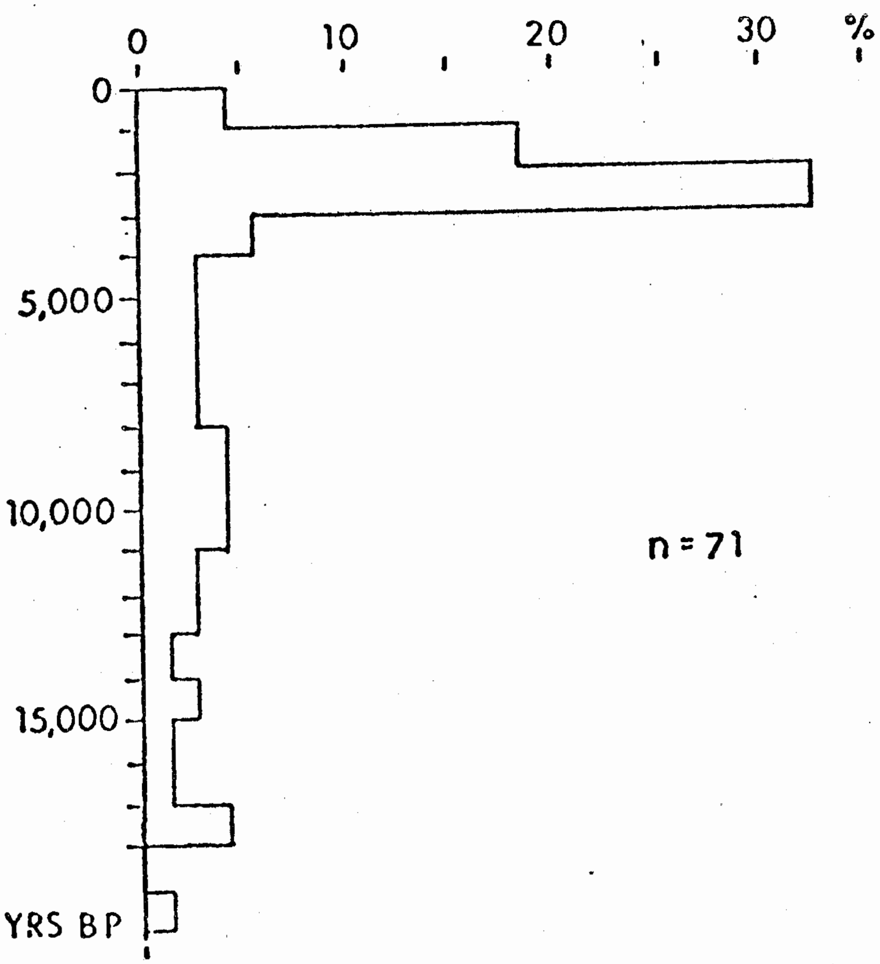

Fig. 55 The frequency of dated LSA occurrences in East Africa based on Bower (1973), Isaac et al. (1971), G. Cole (1967), Gabel (1969), Gramly (1975), Inskeep (1962), L. S. B. Leakey (1931), Leakey and Leakey (1950), M.D. Leakey (1945), M.D. Leakey et al. (1972), Noten (1971), Odner (1971 ; 1973), Pearce and Posnansky (1963), Robbins (1968; 1972). After Nelson (1973).

Table 37 : Some East African Late Stone Age dates after Bower (1973), Odner (1971, 1972), Nelson (1973), Inskeep (1962), Sutton (1966), Gramly (1975), Gabel (1969), M.D. Leakey et al (1972) and Soper et al. (1969).

Site/Occurrence	Pottery	Stone Bowl	
Nsongezi	x	-	125±150 (M1114), 925±150 (M113)
Magosi II/occ 5	x	-	6,080±130 B.P. (SR80)
occ 6	x	-	700±100 B.P. (SR64)
Tunnel Rock/occ 1	x	-	2,050±60 B.P. (Y1397)
occ 2	x	-	2,730±60 B.P. (Y1398)
Long's Drift	x	x	2,750 B.P. estimated average
Prolonged Drift/Stratum 1	-	-	19,000+1270 B.P. (UCLA1687)
Stratum 4	x	x	3,540±120 B.P. (N821)
Lion Hill Cave/occ 1	x	-	More recent than 4,000 B.P.
occ 2	?	-	More recent than 4,000 B.P.
Nderit Drift/sec T	-	-	12,165+210 B.P. (Mean of 4 dates)
sec CC	-	-	Estimated 9,000 - 11,000 B.P.
sec E	-	-	Estimated 4,000 - 8,000 B.P.
sec I	x	?	More recent than 4,000 B.P.
Naivasha Ry Rs	x	-	A.D. 5000 - 5,000 B.P.
Njoro River Cave	x	-	2,920+80 B.P. (Y91)
Narosura/30cm below surf	x	x	2,360±110 B.P. (N-700)
50 - 70 cm	x	x	2,660±115 B.P. (N-701)
70 - 80 cm	x	x	2,760±115 B.P. (N=702)
80 - 90 cm	x	x	2,640±115 B.P. (N-703)
Kavirondo - Rangong	x	-	2,315±185 B.P. (GX1100)
Nyaidha	x	-	2,230±320 B.P. (GX1098)
Jawuoyo	x	-	2,040±85 B.P. (GX1096)
Agoro	x	-	2,375±320 B.P. (GX1097)
Abidhu	x	-	1,980±240 B.P. (GX1099)
Lukenya/occ E/spit 1.35 - 1.4m	-	-	17,670±300 B.P. (UCLA1709A)
spit 1.4 - 1.45m	-	-	17,700±760 B.P. (UCLA1709B)
occ F/spit 1.80 - 1.85m	-	-	15,320±450 B.P.(GX3699)
spit 1.90 - 2.0m	-	-	13,730±430 B.P. (GX3698)
spit 1.90 - 1.95m	-	-	9,910±300 B.P. (HEL535)

continued--

continued--

Table 37 :

Site/Occurrence	Pottery	Stone Bowl	
Olduvai	-	-	17,550±1000 B.P. (UCLA695)
Kisese II/scraper rich occurrence possibly transitional to Late Stone Age	-	-	18,190±306 B.P. (NPL-37)
Early Late Stone Age Occ.	-	-	10,720±132 B.P. (NPL-36)
Lulullampembele	x	-	3,720±170 B.P. (N-787)
Seronera	x	x	2,020±115 B.P. (N-1067)
Nyangoma	x	-	2,640±120 B.P. (N-493)
Kandaga A9/upper occ	x	-	About 200 B.P. or less (GX 3675)
lower occ	-	-	3,375±180 B.P. (GX3677)
Kwa Mwango/10cm below surf	x	-	About 200 B.P. (GX3680)
40cm below surf	-	-	3,270±110 B.P. (GX3679)
Kirumi Isumbirira/50cm below surf	x	-	3,665±140 B.P. (GX3681)
60cm below surf	-	-	740±150 B.P. (GX3682)

NOTE: The last twelve entries are from eight sites in central and northern Tanzania although Nyangoma is slightly to the northwest of the region.

Age dates from Kandaga A9 (3375±180 B.P. GX-3677), Kwa Mwango (3270±110 B.P. GX-3679), Kirumi Isumbirira (3665±140 B.P. GX-3681, 740±150 B.P. GX-3682) and Lululampembele (3720±170 B.P. N-787), will be examined.

The dates from Kwa Mwango, Lululampembele and the earlier date from Kirumi Isumbirira are all based on charcoal and therefore need no isotopic fractionation correction. One could add the ±80 year uncertainty in the isotopic fractionation to account for the different tree species the samples may have come from, but at the moment we can assume that all the charcoal samples belong to the same species and proceed with testing the probability of comtemporaneity among the three assemblages by computing the z test (Polach 1972).

The three charcoal dates are:

1. Kwa Mwango 3270±110 B.P.
2. Kirumi Isumbirira 3665±140 B.P.
3. Lululampembele 3720±170 B.P.

Probability of contemporaneity

$$Z_{12} = \frac{3270-3665}{\sqrt{110^2+140^2}} = \frac{395}{178.04} = 2.22 = \quad 3\%$$

$$Z_{13} = \frac{3270-3720}{\sqrt{110^2+170^2}} = \frac{450}{202.48} = 2.22 = \quad 3\%$$

$$Z_{23} = \frac{3655-3720}{\sqrt{140^2+170^2}} = \frac{55}{215.64} = 0.26 = \quad 80\%$$

The probability of contemporaneity between the assemblages from Kirumi Isumbirira and Lululampembele are quite high and since the two assemblages are typologically comparable, this is what one would expect. However, the probability of contemporaneity between the assemblages from Kwa Mwango and Kirumi Isumbirira and Kwa Mwango and Lululampembele is surprisingly low. On adding the ± 80 years uncertainty in the isotopic fractionation correction in case the charcoal samples have come from different tree species, we get the following:

1. Kwa Mwango date becomes $3270 \pm \sqrt{110^2 + 80^2} = 3270 \pm 136$ B.P.
2. Kirumi date becomes $3665 \pm \sqrt{140^2 + 80^2} = 3665 \pm 161$ B.P.
3. Lululampembele date becomes $3720 \pm \sqrt{170^2 + 80^2} = 3720 \pm 188$ B.P.

Probability of contemporaneity based on the above corrected dates is as follows:

			Probability of Contemporaneity
$Z_{12} = \frac{395}{210.75}$	$= 1.87$	=	ca. 7%
$Z_{13} = \frac{450}{231.39}$	$= 1.94$	=	ca. 6%
$Z_{23} = 55$	$= 0.22$	=	over 80%

Addition of the extra ± 80 years uncertainty does not very much change the probability of contemporaneity, but comments will follow later.

The bone dates from Kandaga A9 of 3375 ± 180 B.P. and the later date of 740 ± 140 B.P. from Kirumi Isumbirira are not collagen dates and as such, are less reliable. However, after the isotopic fractionation correction factor which is given as 250 years for South African bone (Lerman 1972), the Kandaga A9 date becomes:

4. (3375±180) + 250 = 3625±180 years B.P., while the date from Kirumi Isumbirira becomes

5. (740±150) + 250 = 990±150 years B.P.

The probability of contemporaneity between all the dates is then calculated:

$$Z_{14} = \frac{3270-3625}{\sqrt{136^2+180^2}} = \frac{355}{225.60} = 1.57 = \text{Over } 10\%$$

$$Z_{15} = \frac{3270-990}{\sqrt{136^2+150^2}} = \frac{2280}{202.47} = 11.26 = 0\%$$

$$Z_{24} = \frac{3665-3625}{\sqrt{161^2+180^2}} = \frac{40}{241.50} = 0.17 = \text{Over } 80\%$$

$$Z_{25} = \frac{3665-990}{\sqrt{161^2+150^2}} = \frac{2675}{220.05} = 12.16 = 0\%$$

$$Z_{34} = \frac{3720-3625}{\sqrt{188^2+180^2}} = \frac{95.00}{260.28} = 0.36 = \text{Over } 60\%$$

$$Z_{35} = \frac{3720-990}{\sqrt{188^2+150^2}} = \frac{2730.00}{240.51} = 11.35 = 0\%$$

Comments

From the *z* tests we can make the following observations:

1. The assemblages from the middle layers at Kirumi Isumbirira are not only typologically similar to those from Lululampembele, but they are also contemporary. Both the Kirumi and Lululampembele assemblages are most likely contemporary with the middle and lower

deposits at Kandaga A9 although there is a 40% chance that the dates from Lululampembele and Kandaga A9 came from different populations. They are also broadly similar typologically (see Chapter 2).

2. Kwa Mwango deposits are typologically comparable to those from Kandaga A9, Kirumi Isumbirira and Lululampembele, but the probability of contemporaneity between the Kwa Mwango assemblages and the rest is low, being between 6% and 10%. The low probability is accepted since the dates do not really date a single event in a single site and can be explained by the differences in the actual time of the manufacture of the four assemblages. The four dates are therefore accepted as representing the true antiquity of the lower and middle deposits at the four central Tanzania Late Stone Age sites.

3. There is no contemporaneity between the later date from Kirumi Isumbirira and the other dates, and since the bone sample on which this date is based was collected 10 cm. below the sample which gave the earlier date, we can only ignore the date as a bad one. The bone sample may have been contaminated, but bone dates are always unreliable unless they are collagen dates.

4. The modern dates of 200 B.P. or less are accepted as representing the antiquity of the upper occupation layers after the Late Stone Age/Iron Age contact in

central Tanzania.

This analysis shows that although there is temporal variability in the Late Stone Age of central Tanzania, such is not great, and as Table 37 and Fig. 55 show the central Tanzania Late Stone Age assemblages are temporally within the 51% bracket for the East African Late Stone Age. There are a few exceptional cases such as the occurrences at Kisese II, but until the latter are fully described and their proper chronological/cultural status established, it is only safe to say that the Late Stone Age of central Tanzania is bracketed between 3500 and 200 years B.P. with Iron Age components becoming more and more prominent in the upper limit of the continuum.

Inter-site Comparison

The four assemblages were excavated from rock shelters with rock paintings (Chapter 2). In three of these the flaked lithic assemblage is associated with pottery in the upper layers and a few faunal remains, but in the fourth, i.e. Majilili 2B, there was neither pottery nor faunal remains. In terms of physical site characteristics, the four assemblages are therefore easily comparable. It has been suggested that rock shelters may easily localize cultural types or activity facies (Leakey 1935:93; 1936:68), but Nelson (1973) has shown that this is not necessarily the case. Both rock shelters and open sites tend to be associated with artifact assemblages which contain a wide variety of implements, although rock shelters generally tend to show the greatest balance and diversity of tool types. The vast majority of prolonged continual site occupations occur at rock shelters for the simple reason that rock shelters afforded more ideal camping spots for hunters and gatherers.

Nelson (1973) employed several techniques including a hierarchy of nested types, cumulative frequency graphs, Euclidian hyperspace and Gower's coefficient at various levels of tool classification but results continued to show high inter-site variability. He therefore concluded that geographic variability in the Late Stone Age is the rule rather than the exception. In the present study a simple frequency graph has been used to show the distribution of different tool types in the four assemblages compared with one another (Fig. 56).

Overall, in all four sites, microliths (especially crescents and backed flakes), outils écaillés, scrapers, retouched waste, and utilized flakes are the most dominant types, a patterning which may be explained in terms of responses to broadly similar ecological niches. However the respective proportions of the tool types between the sites are all different. For instance, Kandaga A9 has the highest inter-site percentage of backed flakes and utilized flakes, but the lowest in trapezes, outils écaillés, and retouched waste. Majilili 2B is the most similar to Kandaga A9 though very poor in microliths. Kwa Mwango and Kirumi Isumbirira are more alike in

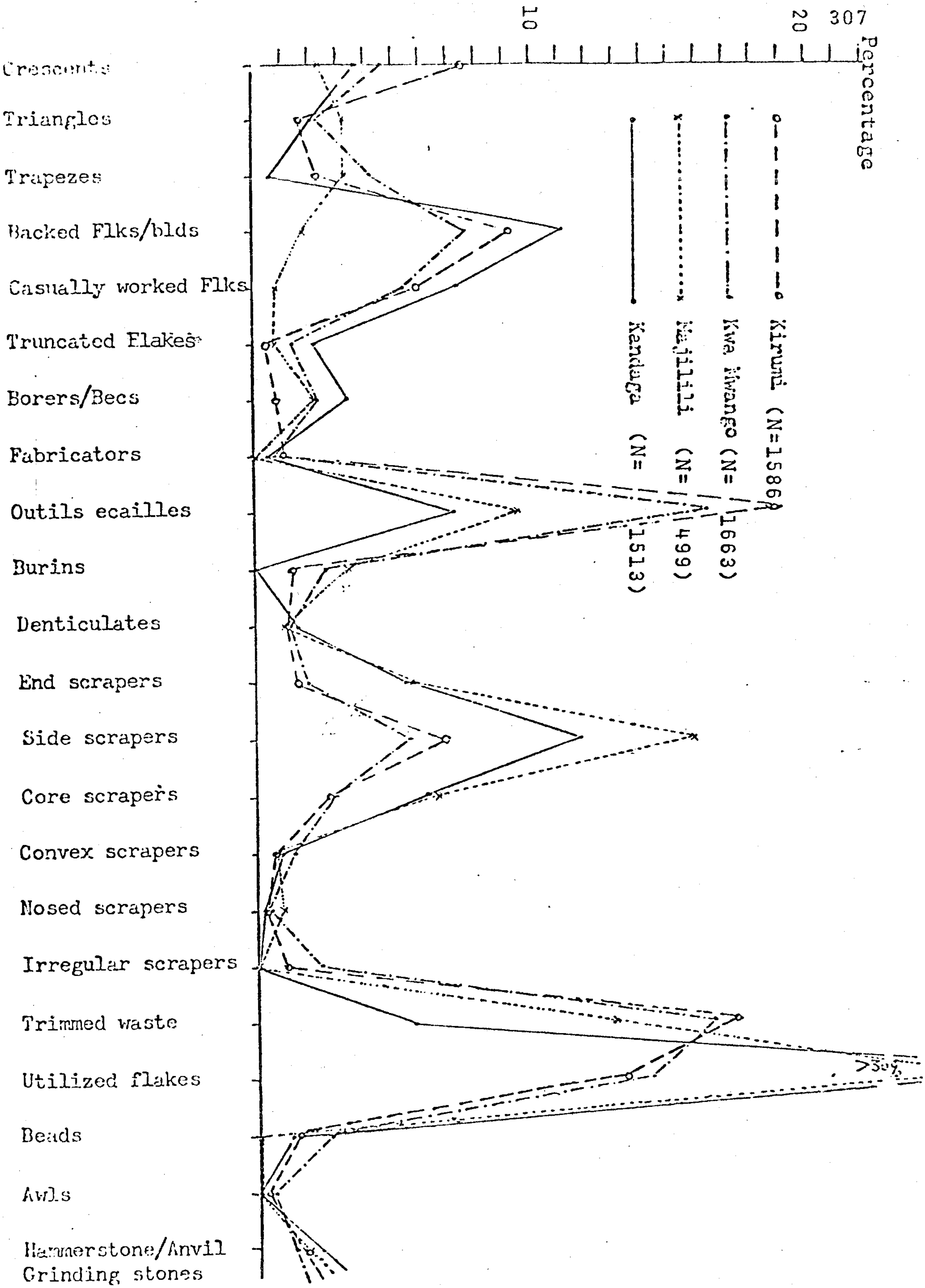

Fig. 56. Comparison of percentage tool (shaped and unshaped) frequencies from Kandaga, Majilili, Kwa Mwango and Kirumi to show inter-site variation.

terms of relative and absolute distribution of artifact types. Both are richer in crescents, <u>outils</u> <u>ecailles</u> and retouched waste than any of the other sites, but they are also the poorest in scrapers and utilized flakes. The patterning observed is again explained by the fact that more similar geographical and ecological conditions obtained between Majilili 2B and Kandaga A9 on one hand and between Kwa Mwango and Kirumi Isumbirira on the other (see Chapter 2). There are no localized forms or any technological attributes which would be explained by idiosyncratic cultural traditions resistant to technological innovations. The raw material used and the w/l ratios of the different artifact types also suggest that the level of lithic technology was much more comparable between Kwa Mwango and Kirumi Isumbirira than any of the other sites. There is therefore definite ecological or geographic variability, as implied by artifact use variability in the Late Stone Age of central Tanzania. This variability is masked by broad artifact levels of analysis (Fig. 57). Assuming temporal comparability, the analysis shows that assemblages from comparable biophysical environments are more alike.

Intra-site Comparison

The comparative analysis which follows is based on typological classes rather than attributes. Nelson (1973) has noted that one of the features characteristic of sites which were occupied for a substantial period is assemblage stability

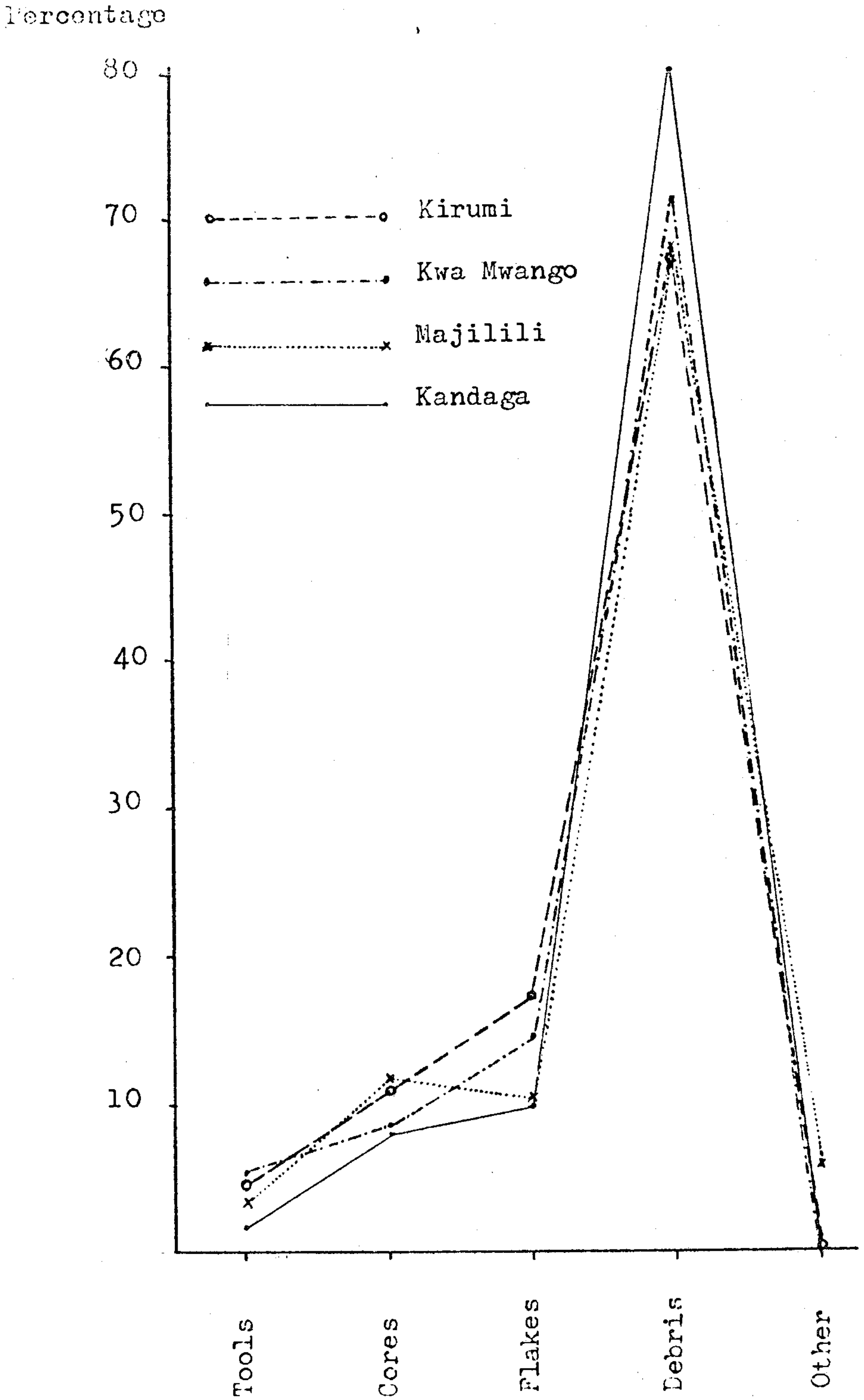

Fig. 57 Comparison of the four assemblages to show inter-site variability. Note that at the broad artifact level of comparison there is not as much variability as at the more specific tool level of comparison. For absolute frequencies refer to tables 4, 10, 12 & 15.

in contrast to geographic variability. When the distribution of tools and other artifacts in each of the four assemblages is compared by levels, it is at once seen that there is hardly any stratigraphic succession stability (Figs. 58,59,60,61,62), and the general trend as shown by the stratigraphic succession of tool types is variable artifact concentration with depth. However the stratigraphic fluctuating frequencies are fairly regular so that with the exception of a few types, the relative frequencies are maintained throughout the cultural stratigraphic succession as shown by such categories as microliths, outils écaillés, retouched waste, scrapers and utilized flakes.

Nelson (1973) has argued that stable frequencies which disclose directional trends over long periods are also common in a few sites. Such trends may involve the gradual replacement of key types or technological processes, shifts of one raw material to another, or changes in overall artifact size and form. He cites Gamble's Cave, Apis Rock, Muringa rock shelter, Tunnel rock shelter and Kisese II are examples of this kind of succession.

At Kandaga A9, the major element of variability is in the spatial distribution of artifacts within the site (Fig. 63). The deposits in trench I for example were not as deep as those in either trench II or III and yet trench I yielded more tools in absolute as well as in relative terms. (Chapter 2). While in general there was an overall decreasing frequency of tool types with depth, the richest artifactual levels were the middle levels, especially layers 7-12 in trench II, while the upper layers were rich in Iron Age artifacts. This variability as was suggested in Chapter 2 is suspected to reflect acitivity areas while the presence of Iron Age material especially in trench II, suggests that the site was occupied by a group of people who at first practiced a Late Stone Age culture but later on acquired Iron Age culture. No apparent decrease in artifact size was observed as at Kandaga A9, nor was there any change of raw material; the raw material being predominantly quartz and some very little quartzite and obsidian throughout the stratigraphic succession.

At Majilili 2B, some directional trend of changing stratigraphical tool type density is observed in the first three layers (Fig. 60), but after the third layer, the decrease in artifact frequency is remarkable (Table 11). This may be due to one or all of these reasons: a relatively short period of occupation, changes in the use of the site, and/or sedimentation rate changes. The absence of Iron Age artifacts at Majilili 2B suggests that the inhabitants of Majilili 2B did not come into contact with Iron Age people. In form, the artifacts are crude and the overall artifact size at Majilili 2B is larger than in any other of the other three sites; and in spite of lack of corroborative C14 dates, the assemblage at Majilili 2B is perhaps older than any of the other three.

The same trend of stratigraphic successional tool type variability is observed at Kwa Mwango. Unlike at Kandaga A9, there is not as much difference of spatial distribution of artifacts, although artifact frequencies decrease with depth

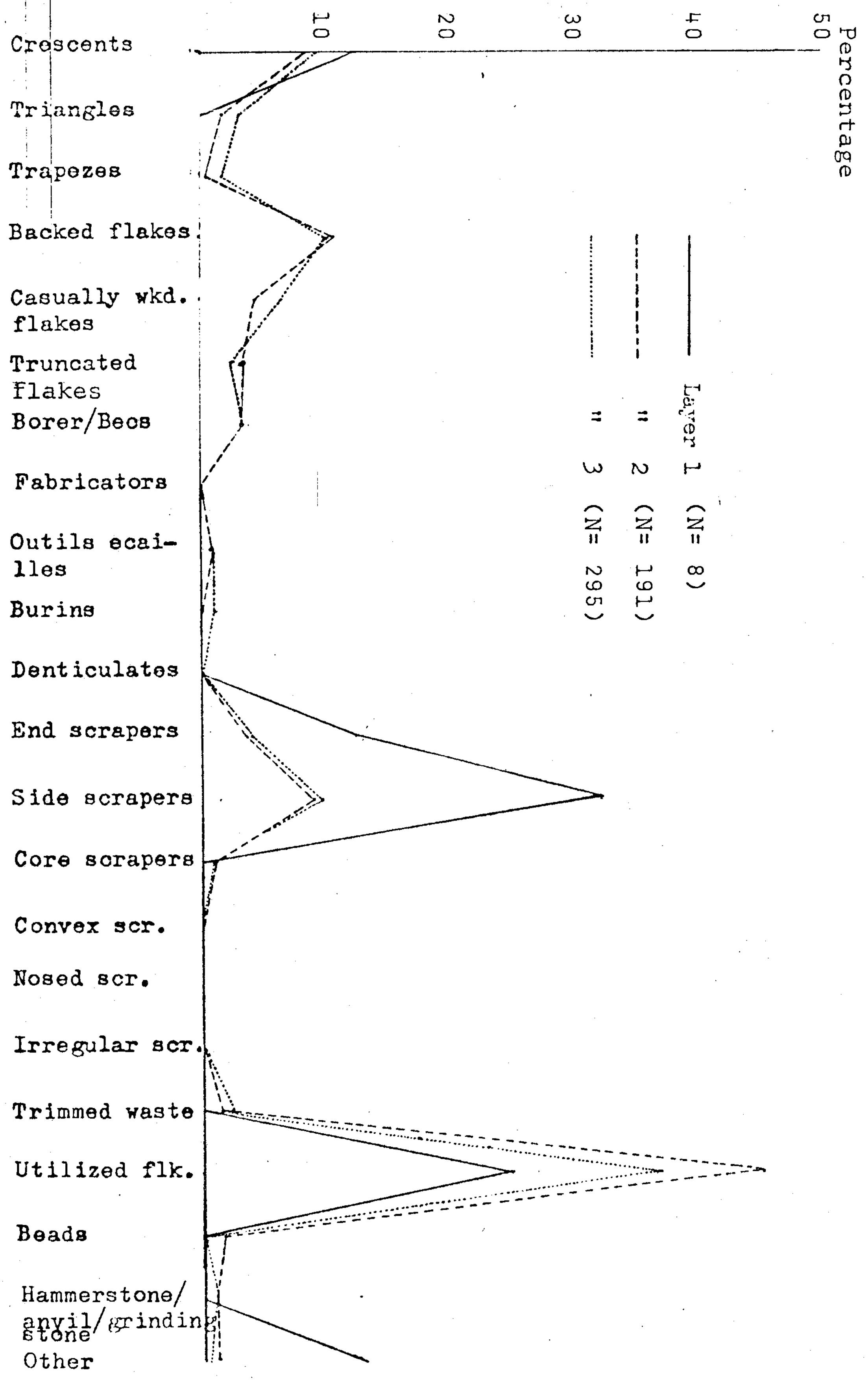

Fig. 58 Stratigraphic percentage frequencies of tools at Kandaga A9 Tr. I. Note that temporal variability between layers 2 and 3 is minimal. For absolute values see Table 5.

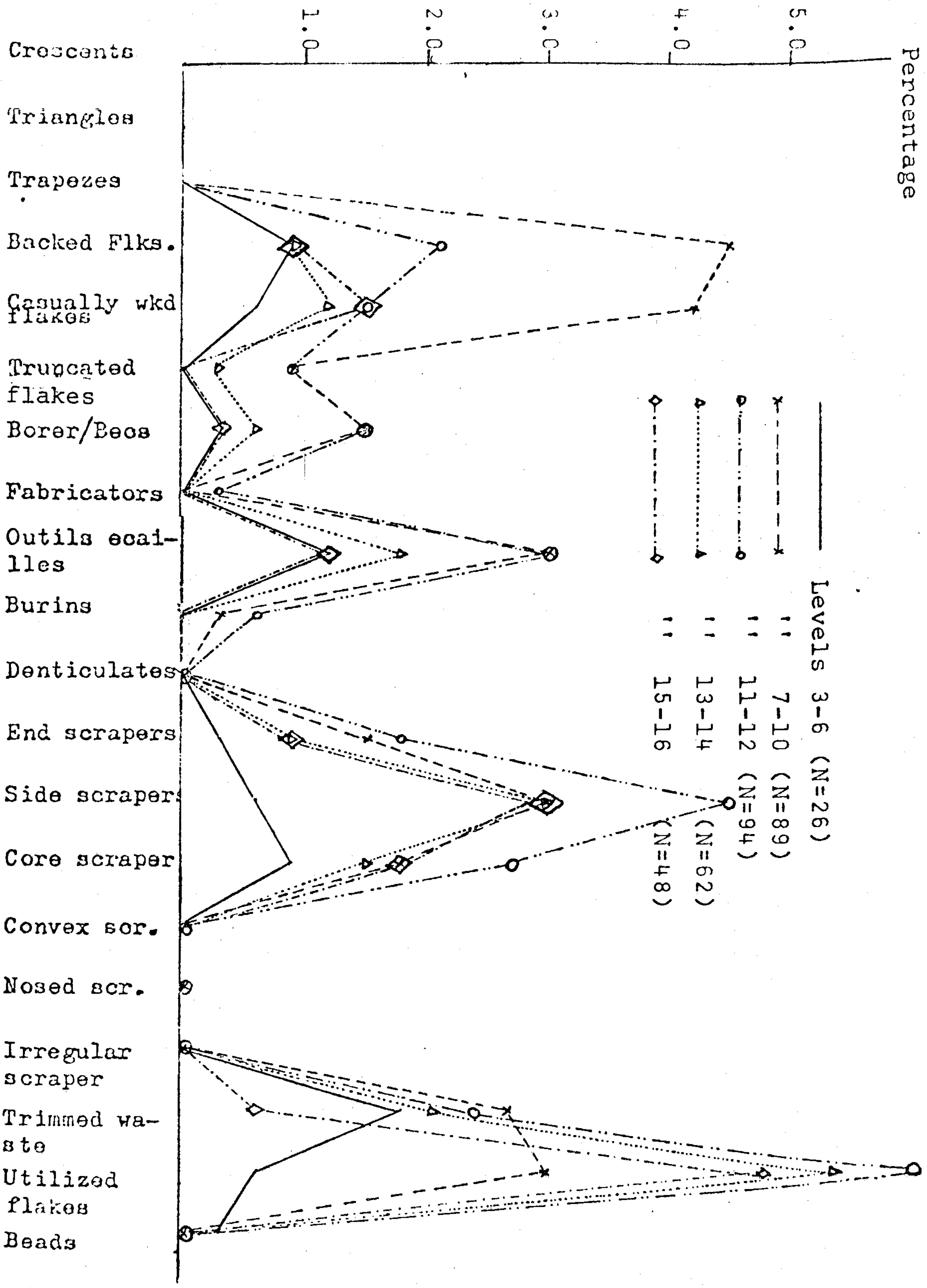

Fig. 59. Stratigraphic distribution of tools at Kandaga A9 Tr. II. Note that other than scrapers, outils ecailles, trimmed waste and utilized flakes, tools form a minor percentage throughout the cultural stratigraphic sequence. Temporal variability is also minor. For absolute values of different tool types refer to Table 6.

more in trench II than in trench I (Table 14 , Fig. 61).

The occurrence of pottery is restricted to the upper levels where it is mixed with lithics. The raw material is predominantly quartz throughout but there are also artifacts made from quartzite and obsidian. However, due to the shallow nature of the deposits at Kwa Mwango, the assemblage does not afford a good example for intra-site comparison.

At Kirumi Isumbirira, the stratigraphical distribution of artifact type in both trench I and II is fairly stable until after Level 6 at which most of the formal tool types fluctuate in a disorderly manner throughout the rest of the levels (Tables 19 , 20). However, the density of artifacts, as mentioned earlier in Chapter 2, is observed to be higher in trench I than in trench II, perhaps a reflection of activity areas (Fig. 64). The overall artifact size seems to increase from level three down to level nine. There are many more scrapers retouched from two sides than in the preceding layers. A few of the bipolar cores have ground edges, perhaps resulting from utilization. In some cases they resemble small adzes and would have been thought as being transitional to ground tools had examples of the latter been found. The apparent larger artifact size in the middle and lower layers at Kirumi, could inter alia, suggest an intermediary phase between Late Stone Age and Middle Stone Age, but due to the very small sample size not amenable to statistical verification and the lack of C14 dates from the lower layers, the speculation cannot

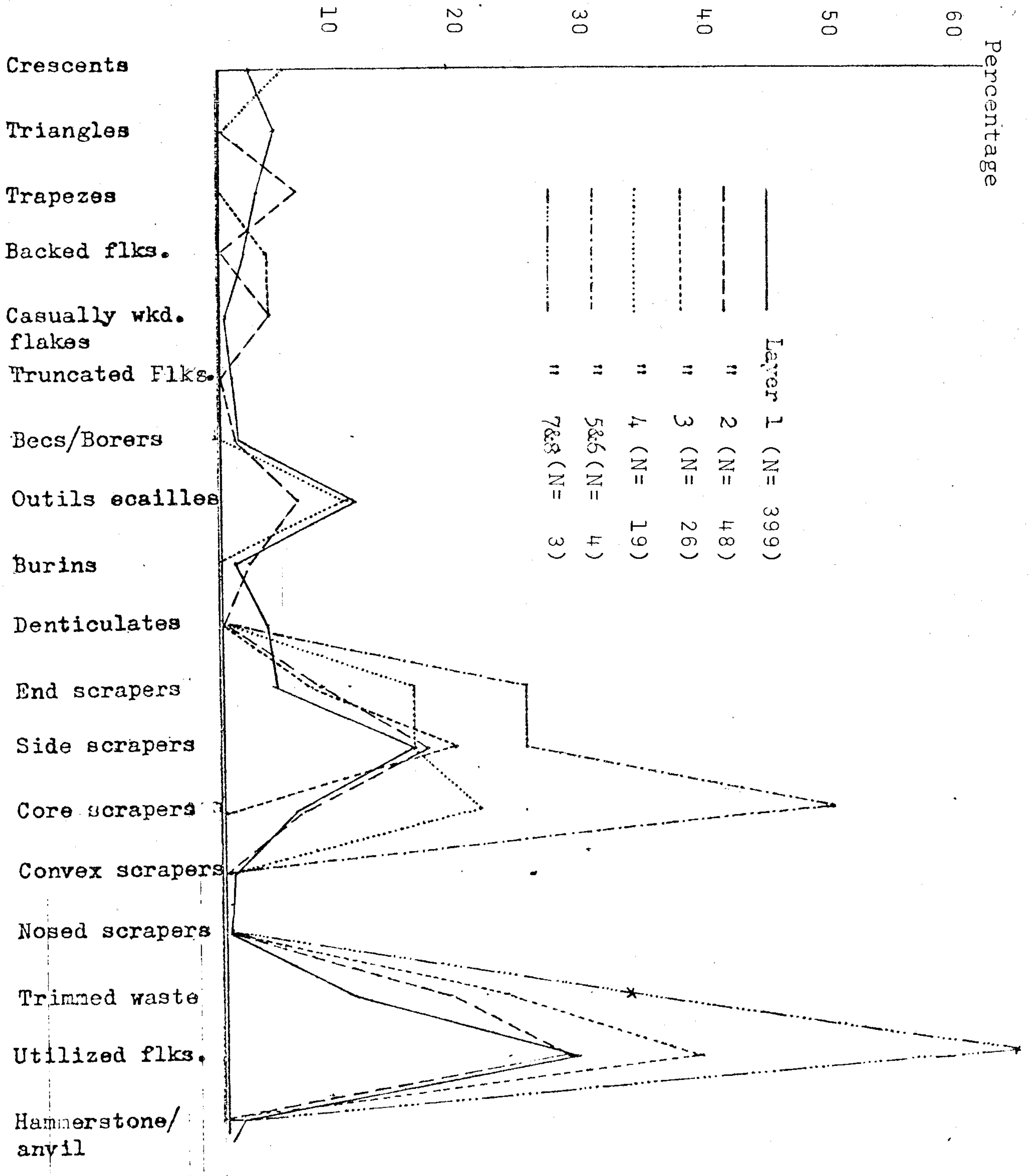

Fig. 60 Stratigraphic percentage frequencies of tools at Majilili 2B. Note that there is remarkable temporal variability between the first three layers and the rest. Compare with Table 11 for absolute frequencies of individual tool categories.

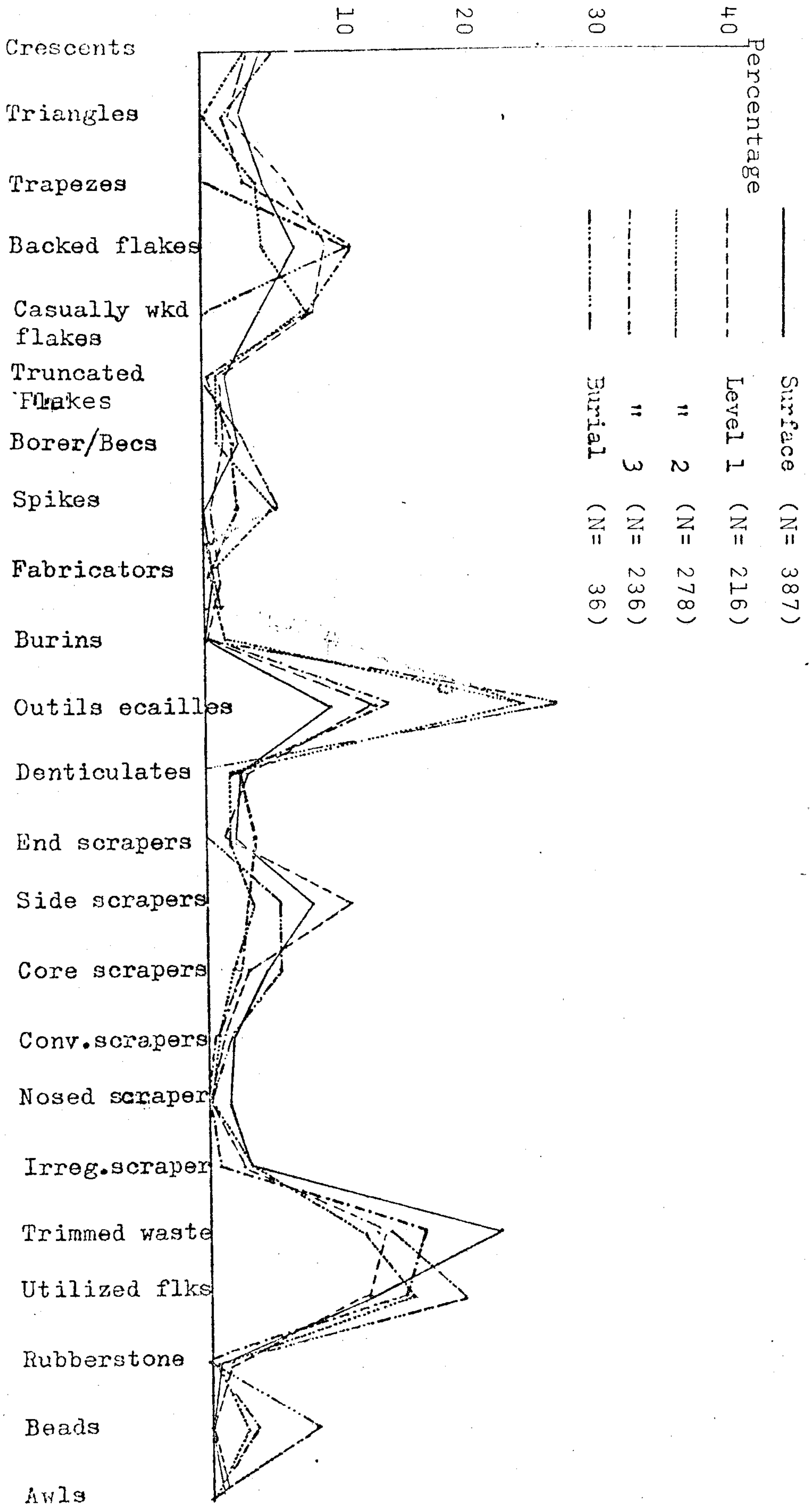

Fig. 61 Stratigraphic percentage frequencies of tools at Kwa Mwango Tr. I. Note the minor temporal changes. For absolute values see Table 14.

be verified.

Alternatively, the change to smaller artifact size in the upper levels, the predominance of scrapers and the overall higher tool type frequencies is a form of temporal patterning and may represent a shift in the technocomplex indicating

(a) response to significant environmental changes such as the composition and distribution of available food resources;

(b) response to the introduction of innovations;

(c) response to local or regional population changes such as the budding of new communities under pressures of population growth or displacement due to the expansion of groups in adjoining regions (Nelson 1973:10).

Activity Facies

The only pattern of internal assemblage variation characteristic of the assemblages from Kandaga A9, Majilili 2B, Kwa Mwango and Kirumi Isumbirira is that of fluctuating artifact type frequencies between successive strata and between trenches. Other types of variation such as artifact size, and absence or presence of specific artifact types are not as significant. It would be interesting to speculate whether the artifact frequency pattern of variation between sites and within sites as documented above may reflect activity facies.

Activity facies are difficult to isolate at the best

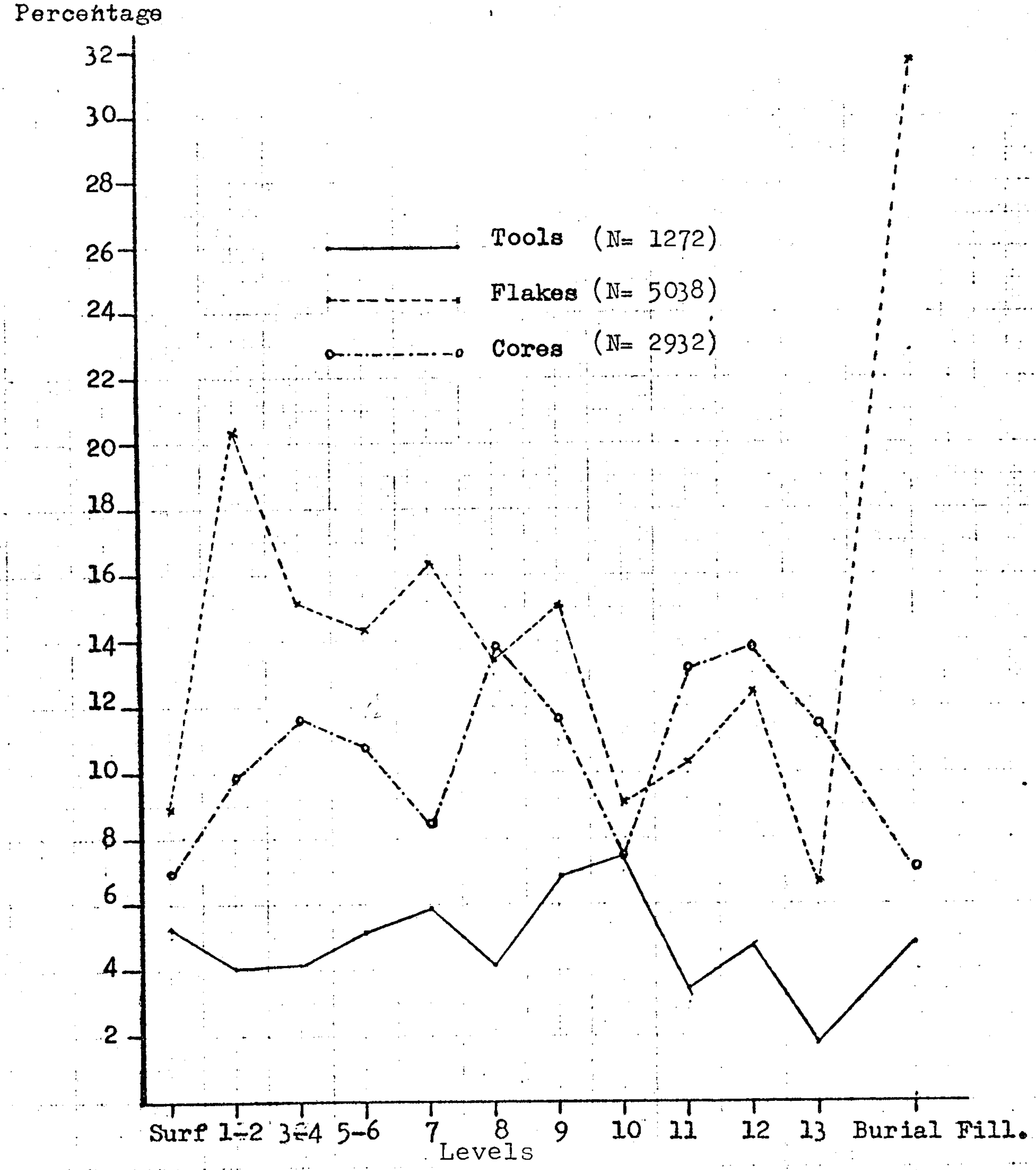

Fig. 62 Stratigraphic distribution of lithic artifacts at Kirumi Isumbirira Tr. I. Note how the percentage of tools, flakes and cores fluctuates between successive stratigraphic units. For absolute stratigraphic frequencies refer to table no. 16.

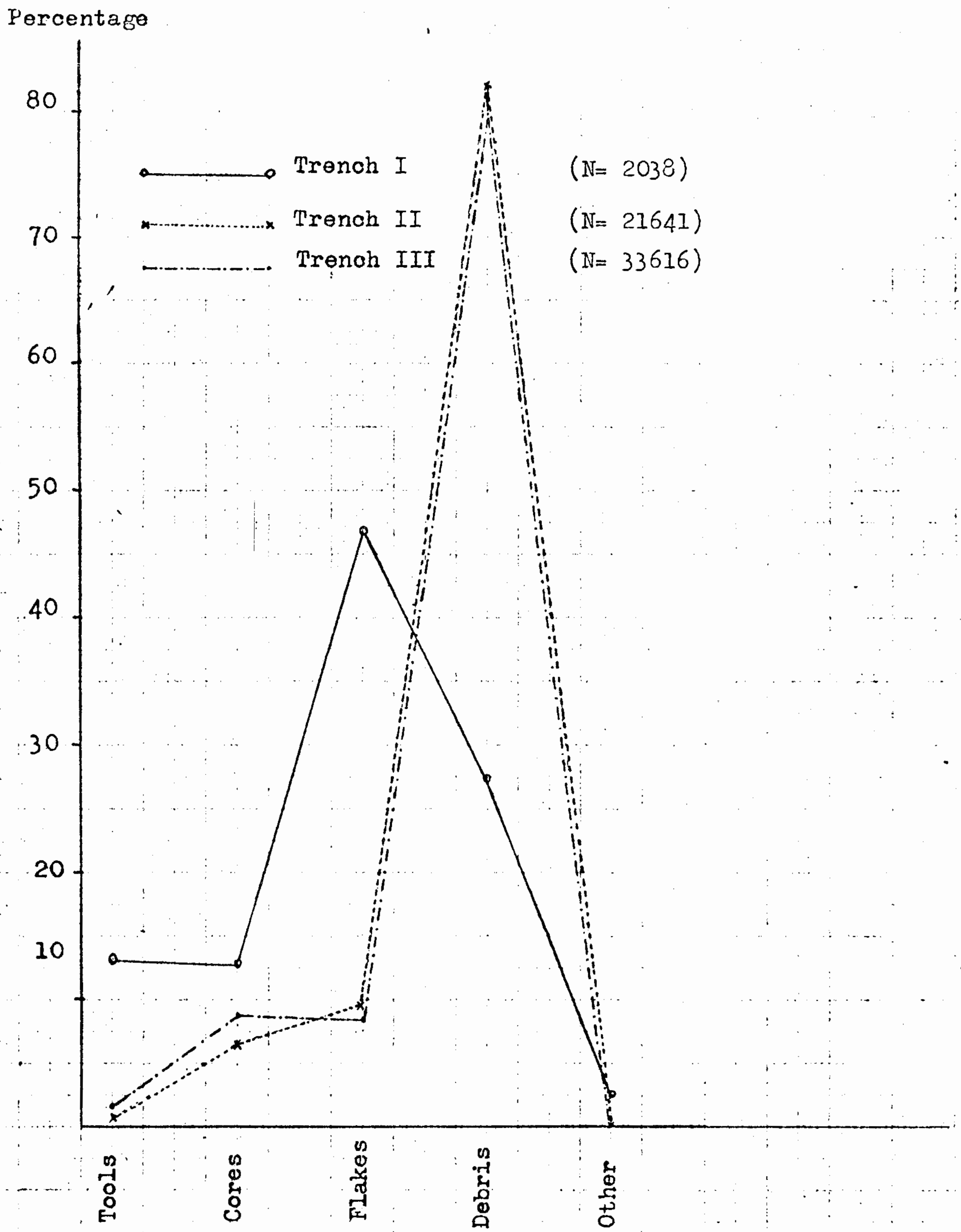

Fig. 63 Percentage distribution of lithic artifacts in the three trenches at Kandaga to show intrasite spatial variability and/or stability. For absolute no. of artifact categories in each trench refer to table no. 4.

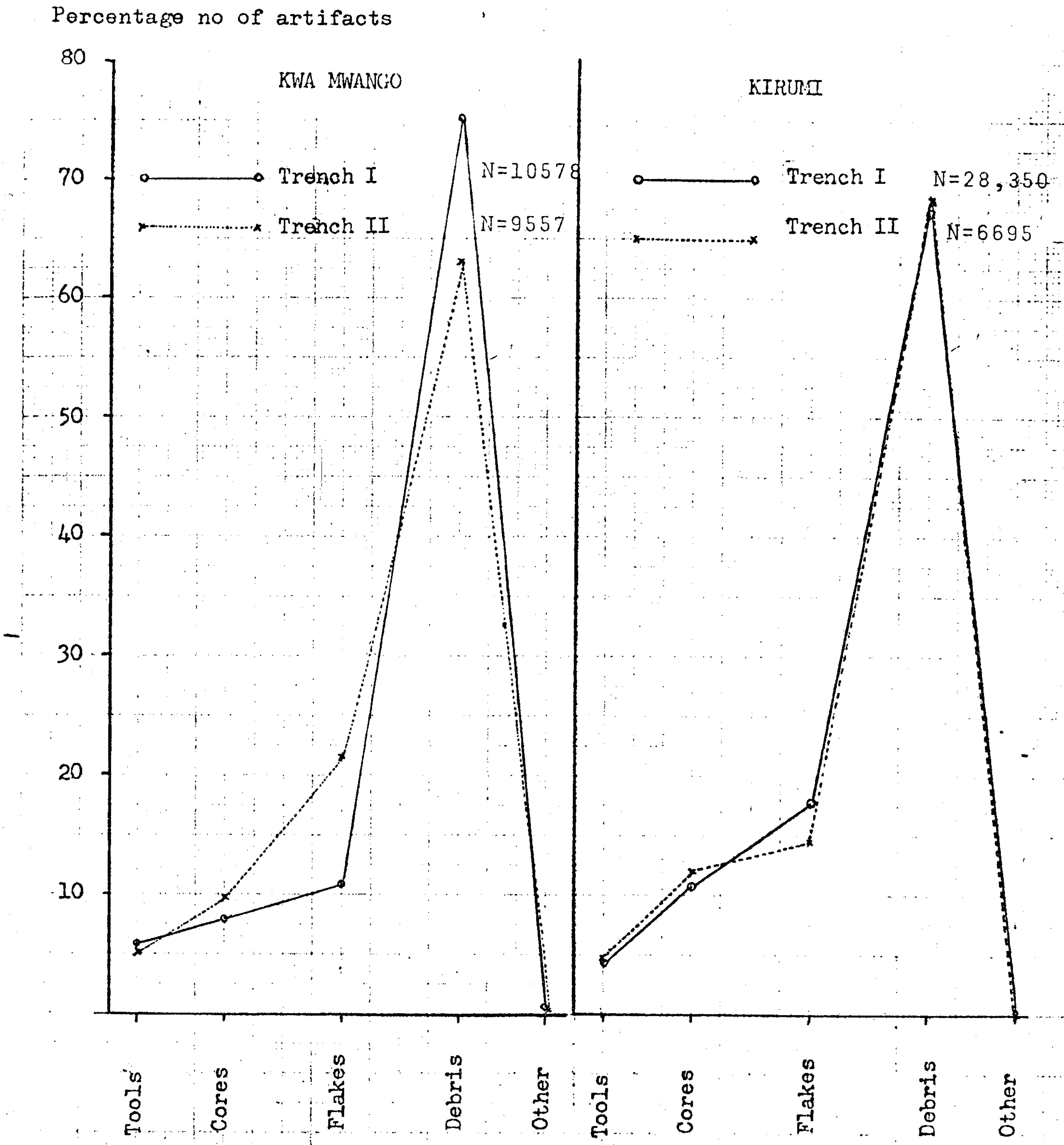

Fig. 64 Percentage distribution of lithic artifacts in the two trenches at Kwa Mwango and Kirumi to show intrasite spatial variability and/or stability.

of times. The literature is replete with instances of presumed activity patterning inferred from temporal and spatial artifact distributions. However, very few artifact types in Late Stone Age assemblages have been demonstrated to be so specialized that they could not be used for multiple purposes. Nelson (1973) has argued that the fundamental difficulty in isolating activity facies is inherent in the fact that artifact categories, as we conceive of them millenia after the fact, simply do not segregate in space and in time in ways which are accounted for clearly by postulated activity facies (Nelson 1973:12). If for instance it is assumed that extreme specialization in the manufacture of basic tool classes is indicative of specific associated activities, then assemblages with abnormally high frequencies of one tool class should represent such an activity. Such assemblages are common in the Late Stone Age of East Africa, but as it is later on argued, they do not necessarily represent such an activity.

In the four assemblages considered in the present study outils écaillés, retouched waste, utilized flakes, scrapers and geometric microliths are the categories which individually account for 30-15% of all flaked tools. In some 30 East African Late Stone Age assemblages reported by Nelson (1973), 11 of the assemblages had individual classes which exceeded 50%, and four of these assemblages had individual classes which exceeded 75% of the flaked stone tools. When the analysis was restricted to shaped tools alone, 28 out of 47 assemblages had individual classes which exceeded 50% while 13 had classes which exceeded 75%. Microliths, scrapers and outils écaillés were also the heavily represented classes. Although these classes might be thought of having distinct functions and thus implying specific activities at certain sites, Nelson (1973), presents the following arguments which render the inference doubtful:

1. Outils écaillés are as was argued in Chapter 3, still a debatable artifact category. Some of the outils écaillés are cores rather than tools and this makes it rather difficult to interpret specific instances in which outils écaillés are especially abundant.

2. It has been shown that the frequency of microliths in Late Stone Age assemblages follows a north-south geographic vector along the highland spine of Africa. Microliths are most abundant in the north and least abundant in the south. Any particular set of activites patterned over such a geographical range is almost inconceivable. The high frequencies of microliths are more a cultural and historical problem, than a functional technological one.

3. If unusual activities were consitently marked by abnormally high frequencies of a single artifact class and all other occurrences marked by well balanced artifact assemblages, then figures for the most frequent classes represented in a series of assemblages should form a bimodal distribution curve. This, however, is not the case. Rather the wide range and unimodal distribution for these figures suggest a far

more complex series of factors are interacting to produce very high frequencies for some classes of implements and corresponding low frequencies for others.

4. If the alternation of scrapers and microliths as observed in some assemblages (e.g. at Nsongezi rock shelter) represent activity facies of the same industry patterned over the East African Late Stone Age, then the relative proportions of scrapers and microliths would form a bimodal distribution curve. They do not.

5. Similar problems are encountered in the Late Stone Age assemblages of Central and South Africa. A large percentage of all South African assemblages, for example, would have to be considered representative of specialized activity facies because of high scraper frequencies. Such a procedure would ignore important historical trends and include the representative of entire industrial taxa in specialized activity facies (Nelson 1973:12-13), but Kleindienst (pers. comm.), has noted that industrial taxa may in fact be interpreted as representing activity facies.

Nelson therefore concludes that it is more than likely that broadly defined categories of flaked stone tools are not very useful in identifying occurrences which were associated with narrow ranges of specialized activities.

The failure to discern activity patterning through artifact type frequency analysis does not necessarily mean that Late Stone Age industries are without activity patterning. Since most tool categories were possibly used for a variety of functions, perhaps more refined techniques such as attribute analysis and microscopic examination of edge wear might help to segregate specific functionally related tool categories unique to some sites and which in the present analysis of broad tool type categories may have been lumped together. In addition, studies of other data such as faunal remains, correlation with gross site characteristics or palaeodemographic patterns might also shed some light on activity facies. Such data are however not yet available. On the other hand if we assume that the economy of the Late Stone Age people was basically unspecialized hunting and gathering, then the use of activity facies as an explanation of typological variability between occurrences would have a low probability in the absence of conflicting independent data.

Until now, prehistorians studying the African Late Stone Age have been unsuccessful in identifying geographically or seasonally isolated activites except those involving the manufacture of flaked stone tools and the disposition of the dead. For instance, there is no doubt that Njoro River Cave was a crematorium (Leakey and Leakey 1950). While the manufacture of flaked tools was one of the activities characteristic of the Late Stone Age industrial complex, the tools were only a means to an end. An analysis of the artifact type frequencies may be utilized to reveal some information pertaining to the area or group of study. The relative frequencies of tools, cores, flakes and other debris are a good indicator of the availability of raw material and in some ways of the manufacturing technique.

Normally in East African Late Stone Age assemblages, debris (flakes and waste) account for 70-80% of the total assemblage whereas tools hardly exceed 10% (Chapter 2). However, abnormally high frequencies of tools have been reported from a few assemblages (Nelson 1973) and in this may reflect local scarcities of raw material in that possible maximum use was made of all the material available. In others, for example at Majilili 2B, abnormally high frequencies of cores were observed. Where such abnormal frequencies of cores have been reported, it has been suggested that they may indicate:

(1) unusually high frequencies of nucleaform cores;

(2) abnormally high secondary utilization of cores as tools; or

(3) a local pattern of tool manufacture in which cores are not systematically exhausted (Nelson 1973:15)

The third suggestion would seem to be the case with Majilili 2B.

The only Late Stone Age occurrences which represent a distinct and geographically segregated activity are the Stone Bowl Industries and associated burial sites. However, most of the burial cairns and stone bowls are much more associated with the latest stages of Late Stone Age and early Iron Age than with Late Stone Age proper. A few of the Stone Bowl Culture and Burial Cairns sites have yielded some flaked stone tools in primary deposition. The people responsible for this culture were perhaps the earliest food producers in East Africa as attested by bones of domesticated animals (cattle, sheep and goats) stone bowls, grindstones and pestles and pottery. Thus, there are two activities here; one associated with burial ceremonies at which mounds of rock, stone bowls, grindstones were built for the dead, and the other grinding of grain and preparation of food (pottery and bowls). (Leakey and Leakey 1950; Cohen 1970; Sutton 1973; Bower 1972; Merrick 1973).

Synthesis of the central Tanzania Late Stone Age

A complete general synthesis of the Late Stone Age in central Tanzania is not possible due to the paucity of comparative data (Chapter 2). Nevertheless, the data from the four sites described in this study together with those from Lulu-lampembele (Odner 1971), Kisese II (Inskeep 1962), and Nyangoma (Soper, *et al* 1969) suggest several features which characterize central Tanzania Late Stone Age assemblages:

1. Although there are sites such as Kisese II with deep deposits of either transitional stage or early Late Stone Age and older than 10,000 years, most of the Late Stone Age deposits in central Tanzania are between 3,500 and 1,000 years B.P. and in this way conform with the majority of the dated East African Late Stone Age assemblages. (Table 37). Due to the short temporal range (2,500 years), identifiable temporal variants are few. These include:

   (a) Iron Age deposits associated with Late Stone Age lithics in the upper layers, e.g. at Kisese II

(Inskeep 1962), Lululampembele (Odner 1971), Nyangoma and Chole (Soper, et al. 1969), Kandaga A9, Kwa Mwango and Kirumi Isumbirira. There are, however, exceptional cases where the deposits are exclusively Late Stone Age lithics as at Majilili 2B.

(b) Reference to tables 6,8,10,13,18 and 19 in this study, and to those of Inskeep (1962 Fig. 1) Odner (1971 Table 1) and Soper et al. (1969 Tables 1 and 2) shows that microliths, especially crescents, seem to be concentrated in the upper layers. Scrapers too are more frequent in the upper layers except at Kisese II where their frequency is more or less restricted to the middle and lower layers. However the scraper rich deposits at Kisese II are more than 6,000 years older than any of the other six assemblages and as such of little comparative significance.

(c) In the sites where the deposits are deep such as at Kandaga A9, Majilili 2B and Kirumi Isumbirira, the predominant artifacts in the lower levels are *outils écaillés*, retouched waste and a few crude scrapers. At Kisese II the lower levels were particularly scraper-rich (Inskeep 1962).

2. Like temporal variants, regional variants characteristic of the central Tanzania Late Stone Age are difficult to isolate, but the present writer has proposed the

following.

(a) Even with the limited number of published sites, it is noteworthy that at least 90% and 5% of the raw material used in the Late Stone Age of central Tanzania was quartz and quartzite respectively. The amount of obsidian used was negligible suggesting that there was very little contact, if any, with the Late Stone Age people of northern Tanzania who used a large amount of obsidian.

(b) The Late Stone Age of central Tanzania is also characterized by a near absence of some Late Stone Age tool types. Points other than becs and borers are virtually absent although Odner (1971) has reported one tanged point from Lululampembele. Burins are also very rare. The few burins reported from the four assemblages are mostly technical burins. Burins occur in relatively high frequencies in a few industries concentrated in the northern sections of East Africa. They are a type implement for the "Upper Kenya Capsian" and are present in small numbers in the "Elmenteitan", at the "Gumban" site of Nakuru and at Njoro River Cave (Nelson and Posnansky 1968: 135-36). Burins become less and less frequent and more difficult to interpret as one moves south from Kenya, presumably due to the fact that the raw material is quartz. Inskeep (1962) reports burins in frequencies ranging from less than 3% to more than 12% in some of the "Second Intermediate" occurrences at Kisese II, but as was pointed out earlier, the lower deposits at Kisese II are not typical central Tanzania Late Stone Age deposits, being much older and typologically different from any other published Late Stone Age assemblages in central Tanzania. In Central and South Africa, burins are equally rare in Late Stone Age assemblages (Nelson and Posnansky 1968:136; Clark 1974:127).

(c) Another regional variant characteristic of the Late Stone Age assemblages in central Tanzania is a relatively low proportion of tools. Even when the tool category is stretched to include unshaped (informal) tools, the tool class hardly accounts for more than 5% of the chipped pieces. For instance, at Lululampembele tools make up only 3.5% at Nyangoma 1,7%, at Kandaga A9 2.64%, at Majilili 2B 3.74%, at Kwa Mwango 5.53% and at Kirumi Isumbirira 4.53% (Odner 1971, Soper, et al 1969). In comparison it is seen that the relative proportion of tools in other East African assemblages is much higher (Tables 21, 22).

(d) Judging by the number of bipolar cores present in the assemblages, the central Tanzania Late Stone Age is also characterized by a bipolar flaking technique.

On a smaller scale, the bipolar technique seems to have been supplemented by a simple technique of bashing a pebble on an anvil and then selecting pieces of a suitable shape for use (direct anvil).

In other respects, the Late Stone Age of central Tanzania is comparable to other Late Stone Age industries in East Africa. Like all other Late Stone Age industries, the microlithic element dominates the shaped tool category and as has previously been argued the Late Stone Age of central Tanzania exhibits both intra-site as well as inter-site variability. Finally the name Kwa Mwango industry should be substituted for central Tanzania Late Stone Age.

The Status of the Late Stone Age in East Africa

The data and documentation available for the Late Stone Age in East Africa suggest tremendous geographic and temporal industrial variability which does not lend itself to regular trends to warrant the designation of specific industries such as the Wilton, the Smithfield, the Nachikufan, as have been identified in central and southern Africa. In dealing with this problem, Nelson (1973) has proposed three broad categories which may be used in classifying Late Stone Age occurrences in East Africa. These are:

1) "standard" Late Stone Age occurrences;
2) "terminal" Late Stone Age occurrences containing pottery; and
3) Occurrences of the Stone Bowl Industries.

While Nelson's three category model will be maintained in this discussion, one other broad category is proposed, i.e. "basal" Late Stone Age occurrences, so that we have four categories instead.

1. Basal Late Stone Age Occurrences

It was pointed out earlier, the East African Late Stone Age industrial complex spans a time period of between 20,000 B.P. and 1,000 B.P. However more than 50% of all dated occurrences fall between 3,000 B.P. and 1,000 B.P. while occurrences that have been dated to be older than 5,000 B.P. are few and far between (Fig. 55, Table 32). Lukenya Hill (Gramly 1975), Kisese II (Inskeep 1962), Buvuma Island (van Noten 1971), Prolonged Drift (Isaac, Merrick and Nelson 1971), and Olduvai Gorge (M.D. Leakey *et al.* 1972) have Late Stone Age occurrences with dates ranging from 20,000 to 10,000 B.P. Some of these older sequences have one or two distinguishing technological features. The Kisese II assemblages from the older levels are exceptionally rich in scrapers (Inskeep 1962), while the older occurrences from Apis rock are characterized by "Magosian-like" artifacts. (Leakey 1936).

At any rate, the variability even within contemporaneous occurrences is still so great that lumping occurrences together on the basis of technological similarities would be impossible. However, due to the fact that dated occurrences that antedate 5,000 B.P. are less than half of all dated occurrences, this writer proposes the term "basal" Late Stone Age occurrence for all the occurrences lying between 10,000 B.P. and 20,000 B.P. The date of 10,000 B.P. is arbitrarily chosen and since it has been shown that assemblage stability is a feature characteristic of sites occupied for substantial periods, perhaps the standard error is of the magnitude of ±1,000 years. The important point is the recognition of occurrences preceding the "Standard" Late Stone Age occurrences.

2. "Standard" Late Stone Age Occurrences

These are the occurrences falling roughly between 11,000 B.P. and 4,000 B.P. (Nelson 1973) . The temporal and geographic variability is much too complex to warrant defining industrial taxa. However, Nelson (1973) reports two exceptions, one the classic Kenya Capsian industry from Gamble's Cave, Section CC at Nderit Drift and several sites on the north flank of Mt. Eburru and the other, the seven occurrences at Lukenya Hill. These two exceptional occurrences are said to fulfill the least minimum requirements for defining an industry. They contain related assemblages well differentiated from other Late Stone Age materials in the adjoining area. They are geographically contiguous occupying an area of a few kilometers on a hillside. Those of the Kenya Capsian cover the period between 11,000 B.P. and 7,000 B.P. and are therefore assumed to represent a historically and culturally interrelated series at the taxonomic level of an industry. (Nelson 1973:16).

At Lukenya Hill, the occurrences span a period of about 2,000 years and appear to represent a single industry. Although the most abundant tool categories fluctuate as much as 20% a portion of the fluctuation is thought to be a response to systematic changes through time. The range of tool forms and the morphology of tool types is reported to be stable throughout the sequence. However, unlike the Kenya Capsian occurrences, the Lukenya Hill occurrences are associated with pottery and in part with a pastoral or semi-pastoral adaptation (Nelson 1973:17; Gramly 1975).

Other examples which may be found to represent specific industries are the lacustrine adapted occurrences at Lothagam and the Lower Kagera Valley in southern Uganda and northern Tanzania. In the former case, the industry seems to be unique and highly patterned; in the other, basic technological processes and the stylistic features of specific artifact classes appear to be stable. (Nelson 1973; Robbins 1968).

Overall, the "Standard" Late Stone Age assemblages may be expected to manifest more of the technological features characteristic of the Late Stone Age. Artifact inventory will vary within and between sites in terms of absolute and relative numbers, but the distribution of tool types will remain more or less the same, with the most frequent tool classes such as microliths, outil écaillés and scrapers obtaining in more or less proportional frequencies.

3. "Terminal" Late Stone Age Occurrences

The final stages of the Late Stone Age in East Africa are characterized by an abundance of pottery, and in some assemblages there is evidence in form of faunal remains of the introduction of domestic animals. Three of the assemblages analyzed in this study (Kandaga A9, Kwa Mwango and Kirumi Isumbirira) (Chapter 2) would seem to fall under the Terminal Late Stone Age. The evidence is present in occurrences spanning the period between 4,000 B.P. and 1,000 B.P. but becomes much more wide spread after 1,000 B.P. There are still significant regional variations reflected in the local archaeological sequences, but there is no apparent break in the continuity with earlier materials. As such the local expressions are more similar to the preceding occurrences within sites than to contemporary regionally separated occurrences. Thus, as Nelson (1973) has observed, there is a problem in recognizing the terminal phases within the Late Stone Age industries, because such recognition might mask the regional phenomena which may have given rise to the many phases. The taxonomic system adopted at Burg Wartenstein (Bishop and Clark 1967) and currently in use in sub-Saharan Africa is not designed to handle cross-cutting classes of events such as these. Thus, in the present taxonomic framework, a separate taxa for the terminal Late Stone Age occurrences cannot be emphasized unless the whole taxonomic system is changed. Needless to say, in some assemblages, the upper occurrences of the terminal Late Stone Age imperceptibly run into the Early Iron Age and depending on the proportion of Late Stone Age versus Iron Age artifacts, might be considered as one or the other.

4. The Stone Bowl Industries

The Stone Bowl Industries constitute an industrial complex.

> They have a distinctive technocomplex, display geographic and temporal continuity and almost certainly possess a restricted suite of economic and ecological associations... (Nelson 1973:18).

Unlike other terminal Late Stone Age occurrences, Stone Bowl occupations are invariably marked by a change in site location. An analysis of metrical patterning particularly that of size as reflected by the Average External Diameter (AED) and of shape as indicated by Average Height (AH) (AH/AED) show moderately consistent geographical patterning. Average diameter decreases from north to south. Flat bowls occur most commonly along the eastern flank of the Rift Valley while tall bowls are characteristic of the Ngorongoro model type, occurring in the southern and western areas (Merrick 1973:128).

The uniqueness of the Stone Bowl Industries as a distinct industrial complex is also shown by the fact that there are no known stone bowl occurrences appearing as terminal components of Late Stone Age occupations at rock shelters or at open sites. This phenomenon considered together with the fact that Stone Bowl Industries are persistently associated with domesticated plants and animals and pottery mean that we are dealing with new technological and economic complexes resulting not so much from shifts in the environmental base, but perhaps from readjustments in demographic patterns (Nelson 1973, Bowers 1973).

Even within the Stone Bowl industrial complex, variability is still too high to justify the designation of specific industries. However, temporal variability is not as great since the dates for the Stone Bowl Industries range from 2920 B.P. to 2140 B.P. The overall cultural significance of the variation within and between the East African Stone Bowl Industries is still unclear, but metrical studies have shown that distinct clusters of bowls are associated with single sites (Merrick 1973:128,130).

Summary

The Late Stone Age industrial complexes in East Africa is far from being well understood. The pioneer works of Leakey (1931, 134, 1936) and O'Brien (1939) suggested 16 possible industries or phases in the Late Stone Age of East Africa. However, with the re-evaluation of the Late Stone Age starting in the 1960's, the classification of the Late Stone Age into different industries began to be questioned firstly because the classification was based on vaguely defined type fossils, and secondly due to lack of systematic and quantitative comparative data. For example, the "Wilton" which to start with was inadequately defined from the type site of Wilton Rock Shelter, was unscrupulously adopted *en mass* from the Horn to the Cape to describe assemblages which were presumed to be typologically similar.

The first taxonomic system for sub-Saharan Late Stone Age was in chaos until the Burg Wartenstein Symposium generated recommendations to guide future African prehistorians. The tendency among contemporary prehistorians has therefore been to eschew the type fossil system in favour of developing regional comparative data, and a taxonomic system amenable to the regional diversity within the Late Stone Age.

The various Late Stone Age industries in East Africa as suggested by the earlier prehistorians are presently lumped together under the Late Stone Age since geographic and temporal variability within and between sites has been shown to be so complex that with the data presently available, the designation of distinct industries would be unjustifiable.

Despite the variability, the present study suggests four broad and tentative classification stages in discussing the Late Stone Age of East Africa. These are;

1. "Basal" Late Stone Age occurrences;
2. "Standard" Late Stone Age occurrences;
3. "Terminal" Late Stone Age occurrnces; and
4. The Stone Bowl Industries.

With the exception of the last one, the classification is based on temporal clustering rather than on technological or typological differences. The central Tanzania Late Stone Age assemblages are best referred to as Kwa Mwango industry.

CHAPTER 5

THE ROCK ART OF KONDOA AND SINGIDA: A COMPARATIVE DESCRIPTION

Introduction

By rock art is meant graphic representation on natural rock surfaces, in caves and rock shelters and on boulders. Apart from paintings, and perhaps tatooing of the human body, it is probably the most ancient of the graphic arts and has been widely practised by men on all continents. The terminology employed for various kinds of rock art has been rather loosely used in the past, but it is now customary that "petroglyph" refers to figures which are carved, incised, pecked or otherwise engraved into the surface of the rock and "pictograph" to figures painted on a rock surface. "Petrograph" is occasionally used as a synonym for petroglyph. In Europe however, rock art is simply described either as rock paintings or rock engravings (Newcombe and Kirkland 1967; Grant 1967). In the present study, the distinction is not tenaciously adhered to because only one type of rock art; i.e. rock paintings, were studied and hereby described. Whenever, therefore, the expression "rock art" appears, it should be interpreted as rock paintings and engravings unless otherwise qualified.

The two types of rock art appear in many parts of the world, but perhaps the most famous and best well known are the

Upper Palaeolithic rock art in France and Spain which date as far back as 30,000 years ago. This European Palaeolithic rock art reached its climax between 20,000 and 10,000 years ago. It is found in deep caves, often in hardly accessible places but in central and southeastern Spain there are also paintings in open shelters as in Africa. Rock art died in Europe at about 5,000 B.C. (Rudner and Rudner 1970:1).

Nobody knows exactly how many rock paintings and engravings are in the whole of Africa. Brentjes (1969) reckons there are more than 100,000 of such pictures but this estimate is probably a conservative one when Rhodesia alone has over 1,500 rock art sites (Cooke 1969:24). If each of these sites is assumed to have ten pictures, then Rhodesia alone would have more than 15,000 pictures.

Reference to Fig. 65 will show that zones of rock art are scattered from the very north to the very south. There is a great variety of these paintings and engravings which make the study of African rock art a difficult undertaking. Rudner and Rudner (1970), divide African rock art into two main groups. The Northern or Sahara group is found north of latitude 16°N in the Sahara Belt from the Atlantic to the Red Sea. Most of the art in this area consists of petroglyphs in the rocky outcrops, while the paintings are concentrated in mountainous rocky massifs such as the Atlas, the Tassili, the Fezzan, the Tibesti and the Uweinat. The southern group occurs in southern Africa south of latitude 8°S and consists mainly of

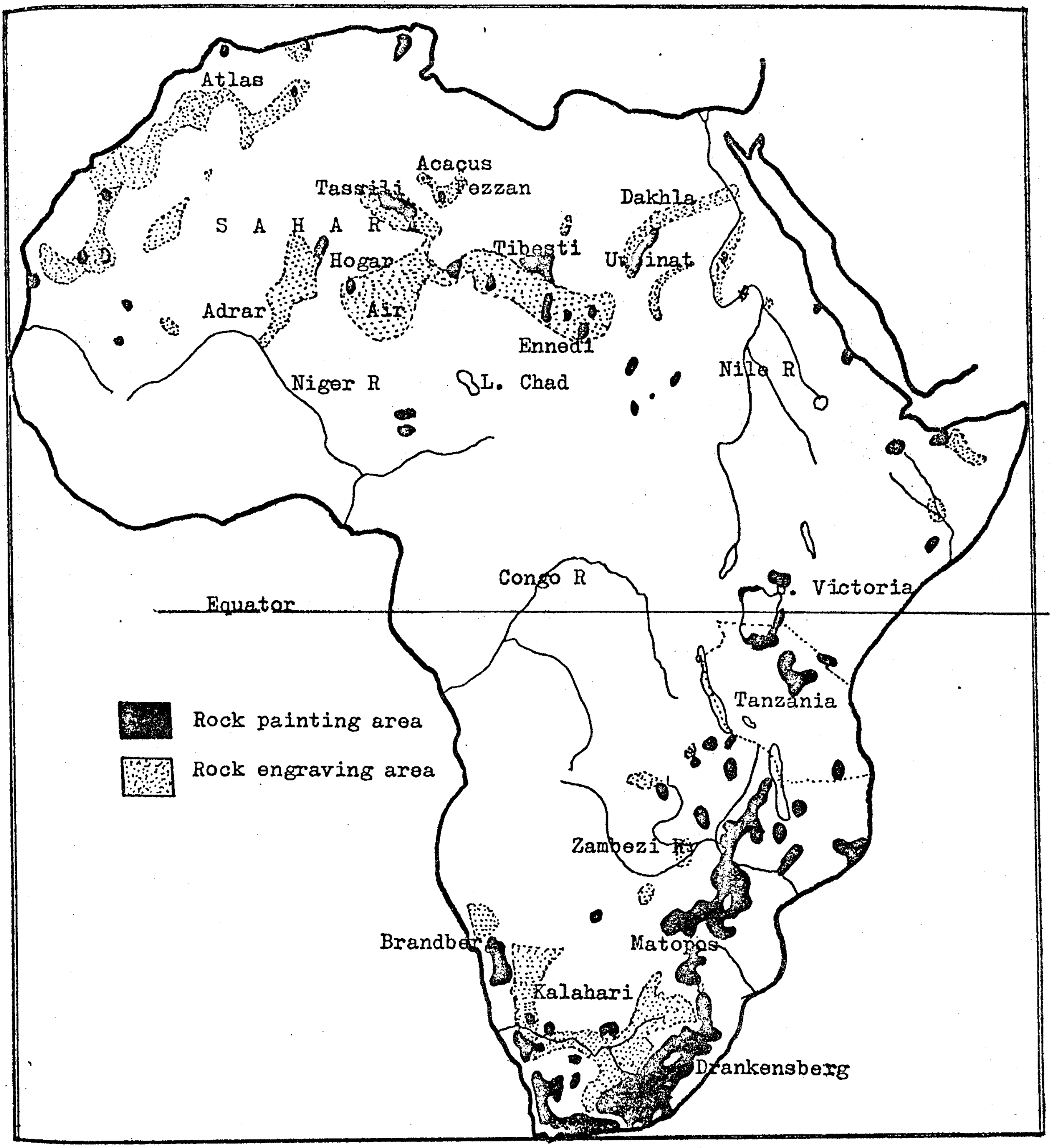

Fig. 65 Distribution of rock art in Africa, after Rudner and Rudner (1970).

paintings and petroglyphs on the Central Plateau.

There is however a third central group which although perhaps smaller than either the northern or southern group, is nevertheless an important one. This is a group of mainly paintings extending from Tanzania, through Kenya and Uganda to Ethiopia, Somalia and the Horn. It is tempting to think of this group as a possible link between the southern group in Zambia and the northern group in Sudan, but there is a wide gap between them. Future research might however either reduce the gap or show that the rock art in the three regions developed independently with convergent similarities. At any rate this is a topic of another section.

There is practically no rock art in the forest belt in West and Central Africa, but again future research might change this overview.

In Tanzania the richest area in rock paintings is the central part composing of the regions of Dodoma, especially Kondoa District, and Singida. (Fig. 66). However, isolated concentrations of rock painting sites are also found in Masasi (Shorter 1967), Dodoma and Mbula (Fosbrooke 1950), Mwanza and Bukoba (Tanner 1953, Arundell 1936, Soper and Golden 1969, Odner 1971, Chaplin 1974), Unyamwezi (Collinson 1970) and the Haida plains (Kohl Larsen 1938, 1958). Needless to say, it would be presumptuous to assume that there are no rock art sites in other areas of Tanzania, for very little concerted effort in archaeological survey has been directed to other

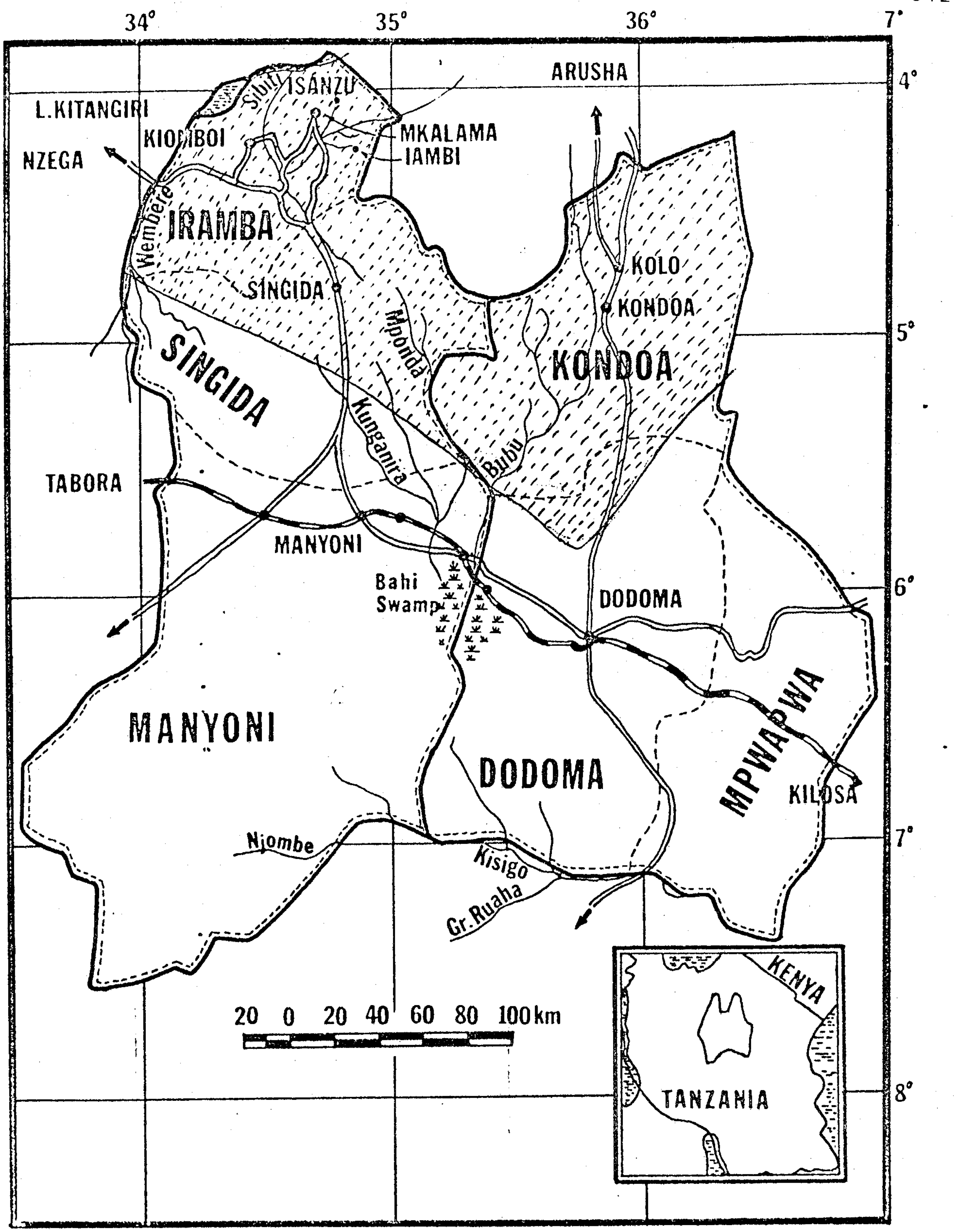

Fig. 66 Belt of greatest concentration of Rock Paintings in central Tanzania (Dodoma and Singida Regions).

parts of Tanzania especially the area lying south of the Central Railway Line. At any rate, central Tanzania, Mwanza and Bukoba seem as the most ideal areas for rock art sites, perhaps due to suitable outcroppings found more in these areas than in any other part of Tanzania (Masao 1976).

Location and Distribution of Sites

As was described in Chapter 1, the geography of the Kondoa and Singida areas is in many ways similar, both lying in the Central Plateau of Tanzania (Fig. 2) with more or less similar geological formations and comparable vegetational patterns. The belt richest in rock sites in both Kondoa and Singida lies roughly between the latitudes 5°30'-4°00S. (Masao 1976:3). The subject of the rock art of central Tanzania is itself exceedingly complex and varied enough for several Ph.D. dissertations. The present chapter therefore does not purport to be even a near exhaustive treatment of the subject. Its inclusion in the thesis can only be justified on the grounds that since some of the rock shelters bearing paintings have also deposits of archaeological assemblages of Late Stone Age facies, perhaps the two are contemporary and culturally associated. Such association is suspected or implied to exist in southern Africa (Wilcox 1963:49; Cooke 1968:18-19; Clark 1970:182-184; Phillipson 1972:315-323; Rudner and Rudner 1970:155-179; Sampson 1974:368-370).

There are three types of rock painting sites; viz. straight faced rock shelters, shelters with overhangs and exterior caves. The second category; i.e. rock shelters with overhangs are by far the commonest type of site, accounting for more than half of the total of 70 sites studied. (Fig.67). The preponderance of the overhang shelter type is perhaps more than fortuitous. Not only did the overhangs offer protection from the direct assault of heavy rainfall and the resultant cascading water and in other times shade from the hot sun, but afforded an ideal place to camp and watch the game. Some of the game thus watched, it may be assumed, formed the subject matter which was depicted on the rock face in various styles and techniques.

In all cases, the first two categories of sites (straight faced rock shelters and overhang shelters) and in some cases, the caves, seem to have been selected for something more than the protection already mentioned. Thus in both Kondoa and Singida, the sites appear high up on silent, bush covered hill-sides, invariably facing and overlooking some plains, a valley or a river. Seldom do these sites occur on low lying ground and such is also the case with most of the South African rock art sites (Rudner and Rudner 1970, Willcox 1963). There are several reasons which may have favoured the choice of such locations. Hill slope sites commanded wide and lovely views out over far reaching plains and of the immediate area around, and as such afforded the best vantage view whether for watching game or hostile warring bands. An old man at Isanzu confirmed that during internecine warfare and the

Fig. 67 A typical Rock shelter-cave from central Tanzania.

Masai raids of historical times, the Wanyisanzu used to retreat to hill slopes and take shelter in the caves. Even to date, the Watindiga never build permanent camps, but instead camps are sited among trees or rocks. Occasionally, animals are shot at night from hides over water and possibly rock blinds and are tracked the following day (Woodburn 1968:51).

The hill slopes were also more suitable for camping, especially during the wet months when the low lying plains would be liable to flooding. Five years ago, for instance, a family in Isanzu had to abandon their mud hut (tembe) to take shelter in a nearby cave because the huts could not withstand the heavy rains. The cave was discovered to contain modern cooking paraphernalia.

The shelters which bear paintings seem to have a definite and fairly constant orientation. In Kondoa, for example, out of 30 sites studied, 25 of them face either east or west with an overwhelming preference for east-facing sites. (See Appendix B). In Singida a similar trend was observed although the east facing preference is not as great. I cannot think of any reason to account for the phenomenon other than to make use of the warming effect of the morning and after the sun is high and hot, the assurance of a shade and a cool atmosphere. Such conditions would also make it less tedious to work in the rock shelter, whether the work was painting the rock shelter or manufacturing tools. Whatever the reasons, the phenomenon is very unlikely a chance occurrence. There seems to have been a deliberate effort to choose east-west facing shelters even when there were other equally suitable shelters but of a different alignment.

In the Giant's Castle Rock area of South Africa, it was observed that 86% of the sites face between east and north-west (Williams 1972:49) while Rudner and Rudner (1970:161) have reported similar orientation of rock art shelters in other parts of South Africa. Unlike in the Giant's Castle Rock area, where most of the painted sites are within 200 feet of water (Williams 1972:49), hardly any of the Tanzania sites are near permanent sources of water.

For the purpose of the present study, a total of 68 rock painting sites, 30 from Kondoa and 38 from Singida were visited but only about half the number were selected for detailed study. The Singida sites have already been described elsewhere (Masao in press) but a gazetteer of all the sites visited and recorded is given in the appendices A-D.

Recording Procedure

There is no standard method or technique of recording rock art, although the degree and extent to which one particular technique is used will be dictated by the local conditions obtaining at the site. In the Cammonica Valley of northern Italy, for example, Emmanuel Anati had a special problem that he solved in an unique way. The rocks bearing the petroglyphs were covered with earth and moss, but when cleaned had too little contrast to photograph. He therefore coated the entire design area of the rock with dilute gouache. When the surface was dry, it was wiped over with a damp cloth leaving a faint tint only in the incisions. The technique was not only fast but accurate in that it brought out a wealth of small details which would otherwise escape detection (Anati 1961:25). On the other hand, if one were working in a hot arid environment, one would probably use a different technique. In the Sahara for example, rock paintings are often overlaid with a calcareous deposit from water seepage, obscuring the designs and making photography difficult. To overcome this, L'hote used an application of kerosene which made the deposits temporarily transparent. More or less similar results could be obtained with water applied with a small pressure sprayer (Grant 1967:73).

In general, there are three widely used methods of recording rock art. Each has its own advantages and shortcomings, its defenders and critics. Ideally, a combination of two or all three should be used whenever practical.

1. Tracings: Tracings offer an accurate full scale copy of the rock art though they duplicate the colours of paintings no more or less accurately than scale sketching. It is also of some advantage that tracings can be done by anyone without any special skills.

The method is however cumbersome and slow, especially when tracings of very large designs and designs high above the floor have to be made. Tracings are also unmanageable in the laboratory or office and must be copied on a reduced scale before they can be used for comparative purposes. (Newcomb 1967:18).

2. Photography: Photography, particularly colour photography is favoured by many investigators because it is rapid and can be a fairly accurate means of reproduction. Willcox (1963:2) for example believes that:

> In recording and reproducing rock art for publication, the most important thing in the present writer's view is that the reader should get a true impression of how the work looks on the rock. This is why photography, especially in colour is preferable to tracing or artist's copies where it is practicable. If complemented by careful tracing so much the better.

In addition to being the quickest and possibly the least expensive, it is perhaps the most objective method. It is best to take both black and white and colour shots of the overall site followed by a horizontal or vertical mosaic of close-up shots, if need be, of the whole rock surface. Black and white photographs may be needed to illustrate a publication, while colour slides are indispensable for painted surfaces and come in handy for projection on paper if line drawings are required (Grant 1967:69).

Photography has its drawbacks too. The degree of success depends on the photographic equipment used and the ability of the recorder to make good use of the available equipment. Natural lighting may not be enough at the time or place of recording, and hence the need to be familiar with time exposures, flashlight, filters, etc. Further still, the usual small size of colour photographs obscure details. They cannot be economically reproduced for publication and cannot be reproduced at all by the cheaper printing methods. As Newcomb (1967:19) has observed;

> Color photography of dim rock paintings often reveal nothing more than pretty patches of color and so are unsatisfactory for comparative and analytical purposes. Photography can also distort color values as well as proportions and fail to record significant parts.

Photographers seem to be the chief culprits in treating rock art with chemicals in order to bring out the colours and may thus ruin the paintings for subsequent investigators.

3. Artists' Copies: These have the advantage of being relatively permanent and easy to use. Newcomb (1967:19) sees an additional advantage in the freehand copying of rock art in that it forces the recorder to minutely study all the details in the panel and therefore discern parts of the drawings which otherwise might fail to attract his attention.

However, scale reproductions of rock paintings are apt to be less accurate than tracings or photographs even though they are meticulously copied. It is not that the copyists intentionally falsify what they see, but the aesthetic cultural framework through which they can see, can warp perception so that they may omit what is present and add what is not there (Newcomb 1967:19). Artists may also deliberately distort reality in that they are inclined to produce colours as they seem to have been originally rather as they appear, several millenia after the fact. Similarly, distracting background may intentionally be minimized so that the paintings stand out more conspicuously than they ever did in reality. The justification of this is that it helps to focus attention on the art itself. The strongest drawback about this method of recording is that it is slow and needs special skills. As Grant (1967:68) has noted, it takes a rather good artist with a keen and observant eye to copy these paintings and engravings accurately. Unskilled attempts are often worse than useless and bear only the vaguest relation to the original when compared to a good photograph.

The overall merits and demerits of each of the above three techniques were considered in the recording of the rock art of Kondoa and Singida. It is probably generally agreed that for some sites and types of rock art one recording technique may be superior while in another region, local circumstances may favour a different technique. In the present study, it was decided to adopt photography as the main method of recording. Artist's sketches were quickly ruled out chiefly for two reasons;

a) we did not have a good artist on the team;

b) it would have taken much too long to make sketches of all the sites studied.

Originally it was planned to supplement the photographic record with as many tracings as possible, but no sooner was the work started than it was discovered that time and the labour force at our disposal would not have made this possible. Tracings were therefore restricted to the shelters at which the lighting was suspected insufficient for good photographs, and even then only selected areas of the rock panel were traced.

Briefly the procedure adopted at each site is as follows:

1. A careful survey of the site and its surroundings was made to determine the site's physical and environmental setting the nature and extent of the painted panel, and whether or not there were any other archaeological-ethnographical artifacts around.
2. Length, breadth and height measurements of the rock shelters were taken wherever it was possible.
3. Detailed notes describing first the overall site and then the paintings were entered in our field notebooks.
4. A summary of the notes in 3 was entered on specially prepared site recording forms and a rough sketch was made.
5. Black and white and colour slide shots were taken. First shots of the site and its surroundings were taken from two different angles. Then a mosaic of several close-ups of selected areas of the rock panel were made and properly recorded in field notebooks.
6. When the lighting was suspected to be weak, tracings were made to supplement the photographs.
7. A sample of all archaeological material (pottery or lithics) appearing on the site was collected and stored together with the site forms.
8. Although there were no small scale topographic maps available, an attempt was made to mark the sites on the 1:50,000

scale maps available.

Styles and Subject Matter

The style or "collective characteristics" (Concise Oxford Dictionary) of the art of a given culture in a given period is difficult to distinguish and define without considering the subject matter of which the styles represent. In the present study therefore, style is taken to include motif and character as well as technique and form. In other words, styles are the design elements which together may distinguish one group of art forms from another or similarize them. As Levine (1968:714) has stated; "By style is meant the constant form and sometimes the constant elements; quality and expression in the art of an individual or group." This laconic statement has by implication two potential important points for studying prehistoric art. One is that style as well as subject matter yield meaning. The other is that an art style refers to a specific group. Style is not, as is sometimes assumed, an aspect of art independent of subject matter or content (Maynard 1974:24). When we talk of style we are concerned with identifying the principle or principles of selection which distinguish the artistic utterance. To this end, Levine (1968:717) comments thus:

> An art style is a particular set of selective principles. Taken as a whole, the style of a particular work of art expresses the perceptive bias of the individual artist as conditioned by a. his peculiar life history and b. the context in which his life unfolds, that context being the human group to which he belongs and its culture.

Vinnicombe (1967:139) has referred to the word style as a "vexatious term" impossible to reduce to objective terms, but uses it for the purpose of analysis in denoting whether a painting is monochrome, biochrome, polychrome or shaded polychrome. Its usage here is not restricted to colour but to all attributes which together constitute the picture.

Before a discussion of the art styles of the rock paintings of Singida and Kondoa as seen by the author is attempted, a summary of other stylistic models is called for. First it must be pointed out that stylistic differences in the rock art of central Tanzania are not easily identifiable because variations both in the tone and the colour of the actual rock surfaces can engender local changes of colour, while exfoliation of the rock or filming over due to water seepage and secretions can hinder detection and thus nullify the classification (Ginner 1950:4).

Leakey (1936, 1950) recognized 17 styles of rock paintings based on a few sites in the Kondoa area. Through superimposition he was able to outline a sequence for thirteen of them, but could not properly fit the remaining four in the sequence. While it is not the purpose of this study to question Leakey's findings, one cannot help but criticize the use of such a restricted model. As far as the author is aware, Leakey's stylistic model was based on three rock shelters, viz. Kisese II, Cheke and Mungumi wa Kolo, all of which are in the Kondoa area. Attempts to duplicate Leakey's model not only in Singida but also in Kondoa ran into so many difficulties that it was decided to abandon it. His sequence was so site-specific that it could not be adopted to generate general hypotheses in studying the rock art in Tanzania. Another limiting factor to its usefulness, as has been pointed out by Odner (1971:178), is that it is impossible to assess the time involved between each superimposition. In 1962 Leakey seemed to suggest that the rock paintings ought to be divided into three groups (Odner 1971). Both Fozzard (1956) and Odner (1971) have found Leakey's model equally restrictive.

In 1959, Fozzard studied six sites in the southwest part of Kondoa district and suggested a sequence of 5 styles:

1. Human figures where the body is filled in with paint and the head is drawn in outline with the center or face left blank - a combination of "solid" and "open line" styles.
2. "Open line" style where the animals are drawn in thin outline only and although the animals are well shaped, the drawings are a little crude and there is not much detail.
3. 'Spot style' where the shapes of the animals are constructed by grouping large spots of orange vermillion paint. There is no outline.
4. Finest 'detailed line'. Here animals are drawn in thin delicate outline with details such as manes, tails and body lines. They are lifelike and full of expression.
5. 'Solid' where both humans and animals are drawn in a thick coat of paint. All the styles except the "spot style"

are drawn in claret red ochreous paint (Fozzard 1959:94).

Fozzard's model was found more applicable than Leakey's but when applied on as a wide area as the one studied for this thesis, the model was also found restrictive. It was therefore decided to suggest another model which would be flexible enough to deal with the full range of stylistic variation.

Odner (1971) after studying a few sites in Iramba (Singida Region) arrived at a three group model of:

1. Realistic or near realistic animals and human beings in solid red.
2. Schematic animals or crudely depicted human beings.
3. White and black - possibly also red symbols including handprints. (Odner 1971:178).

Odner's model and Fozzard's model were considered and modified accordingly to suit the data at hand and as a result a four stage model with substages is suggested here. The analysis of the style and subject matter is conducted in terms of geographical distribution (Appendices A,B &C) and chronological sequential development of isolated design elements of the various motifs and subject matter represented. Basically, the subject matter may be said to fall into four complex stylistic units;

1. Stylized Representations;
2. Naturalistic Representations;
3. White Semi-Realistic Silhouettes; and
4. Abstract and Geometric Figures.

1. Stylized Representations (Figs. 68,69,70)

Stylization may take several modes of depiction. In Tanzania as in Central and South Africa, stylization is seen best in human figures. In general, the whole human figure is schematized in simplistic line drawings with occasional exaggeration for anatomical parts such as the head or muscle. Female figures are rare. In very few instances is the human figure depicted in a complete naturalistic style or clad as those at Mjakhuda (Fig.71) and the Iramba sites of Lululampembele, Kisana Nzuni and Kitulu (Odner 1971:168-174) (Fig. 72).

A common feature of the anthropomorphic figures is their engagement in some activity, e.g. dancing, hunting, running, fighting, or herding. In many cases, when viewed in the whole synactic structure, they express some relationship with all or some of the pictures on the rock panel. The relationship may be of cooperation, opposition[26] or neutral. Apart from the occasional bow and arrow and sometimes a spear, there are hardly any other pictures of objects identified with the present ethnography of the area. At Kitulu , for example, one of the pictures is a bowman holding a tall bow which resembles the ones still used by the Hadza (Fig.72a) (Odner 1971:167). Often, where bows and arrows are depicted, they appear exceedingly long; a feature which may be invoked in speculations concerning the authorship of some of the paintings. Such schematized representations make the art symbolic (Boas 1955:69). Stylized figures are divided into two substyles.

[26] Lewis-Williams (1972) distinguishes two types of scenic relationships: scenes of opposition, e.g. fighting or animals attacking men and scenes of cooperation, e.g. dances, files of walking men, etc.

A. Red thin and thick line drawings: (Figs. 68, 70a, 71).

The figure is schematized all over. Normally the trunk is represented by one, three or four strokes. Sometimes they are so much elongated that they look very disproportional. The trunk stroke forks to represent legs while two more strokes may be added for the arms. The lines may show differential thickening for the buttocks, the calf muscles and the chest. In some, the buttocks are so exaggerated that they almost approach the depiction of steatopygia as seen in the 'Bushman paintings' of South Africa. The head may take various stylized forms without facial features. The simplest form is a mere round shape or blob which sometimes may show a slight concavity on one side for the face. Alternatively, the head may have a reed-like headdress or an animal head mask also stylized (Figs. 68 & 69). The head is joined to the trunk by a simple stroke. The arms may be outstretched sideways, forward, or held pointing down sideways or forward, bent and extended forward, etc., depending on the activity depicted (Figs.68-71). The arms are usually shown thicker at the shoulders and thinner at the wrist. The wrist is sometimes shown with radiating lines which may represent fingers or some ornaments worn on the wrist. In some figures some stylization of musculature especially in the legs is shown, otherwise in the more schematized representations there is no line thickening for anatomical parts. The legs are normally depicted astride and motionless, but there are also examples where motion is depicted by showing one of the legs raised and extended forward. The feet may be shown, but

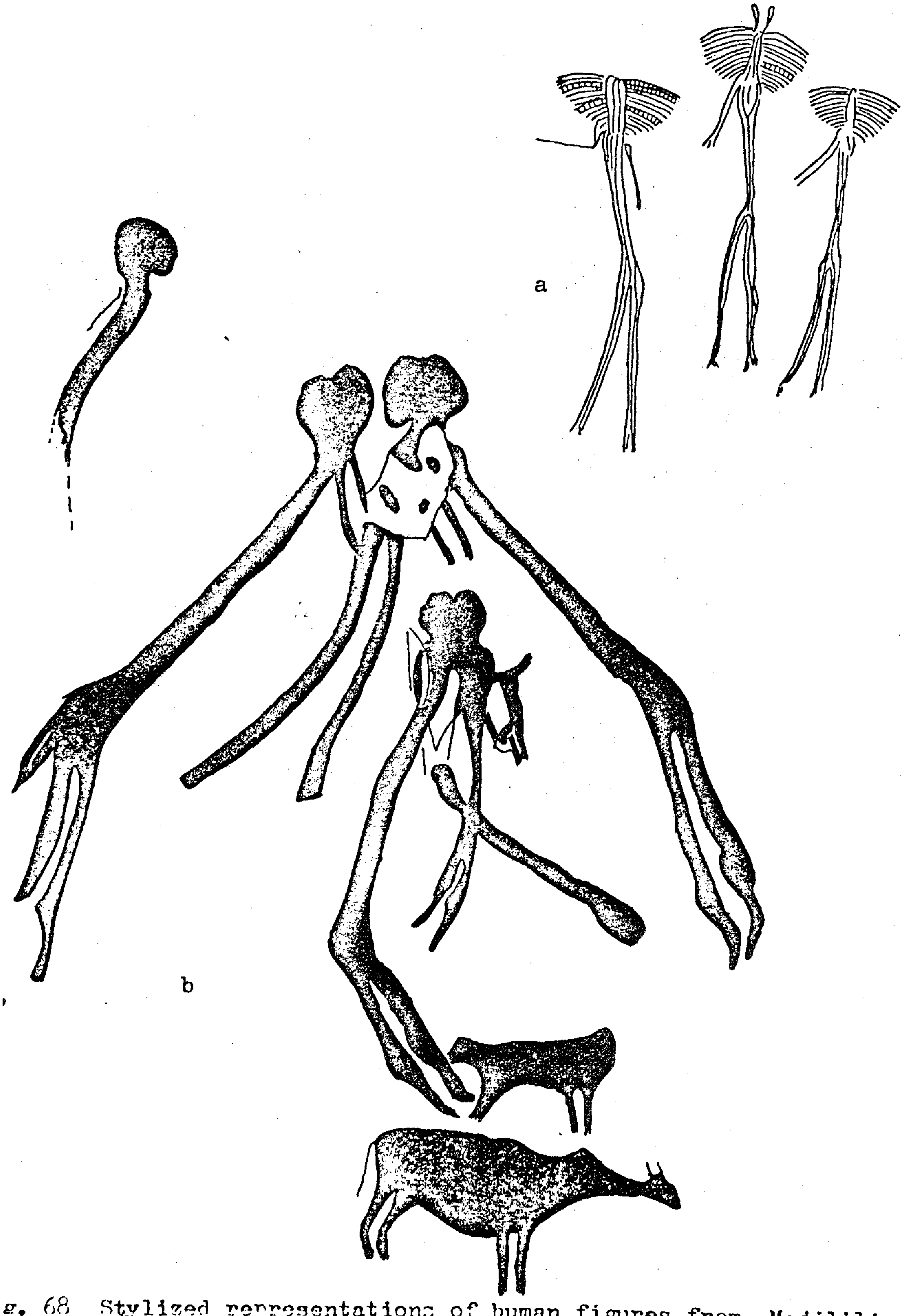

Fig. 68 Stylized representations of human figures from Majilili 2B (a) and Cheke (b). Executed in red.

hardly are the toes included.

B. Red stylized sharp profile silhouettes (Fig. 69)

This seems to be a different style from the one above. The representation is still symbolic but the whole figure (head, trunk, arms and legs) are represented by a thick bold line approaching a silhouette. There is very little exaggeration of body parts. The head and trunk are almost of uniform thickness. The figures are always depicted with some attire especially around the waist, probably a loin cloth, a reed-like headdress and ornamentation around the wrist. Sex is not indicated in this style. The arms are sometime displayed stretched sideways as if demonstrating a dance. Fingers and toes are hardly shown but feet are always shown. There was no sequence of superpositioning detected between 1A and 1B, but it is suspected that 1B is later due to the fact that wherever the two styles appear together, 1B invariably looks clearer and fresher unless the picture has been dulled by seeping water or exfoliation of the rock. This style is not as common for human figures as either 1A or 4C. Like 1A, various shades of ocherous red have been used in painting the figures. Overall, style 1A appears to be more widely distributed in the Kondoa area than in Singida, but 1B is uniformly rare in central Tanzania.

These two styles would seem to correspond in part to style No. 1 of Fozzard (1959) and to Leakey's No. 7 of the sequence at Mungumi wa Kolo. They may also be subsumed under group II of Odner (1971).

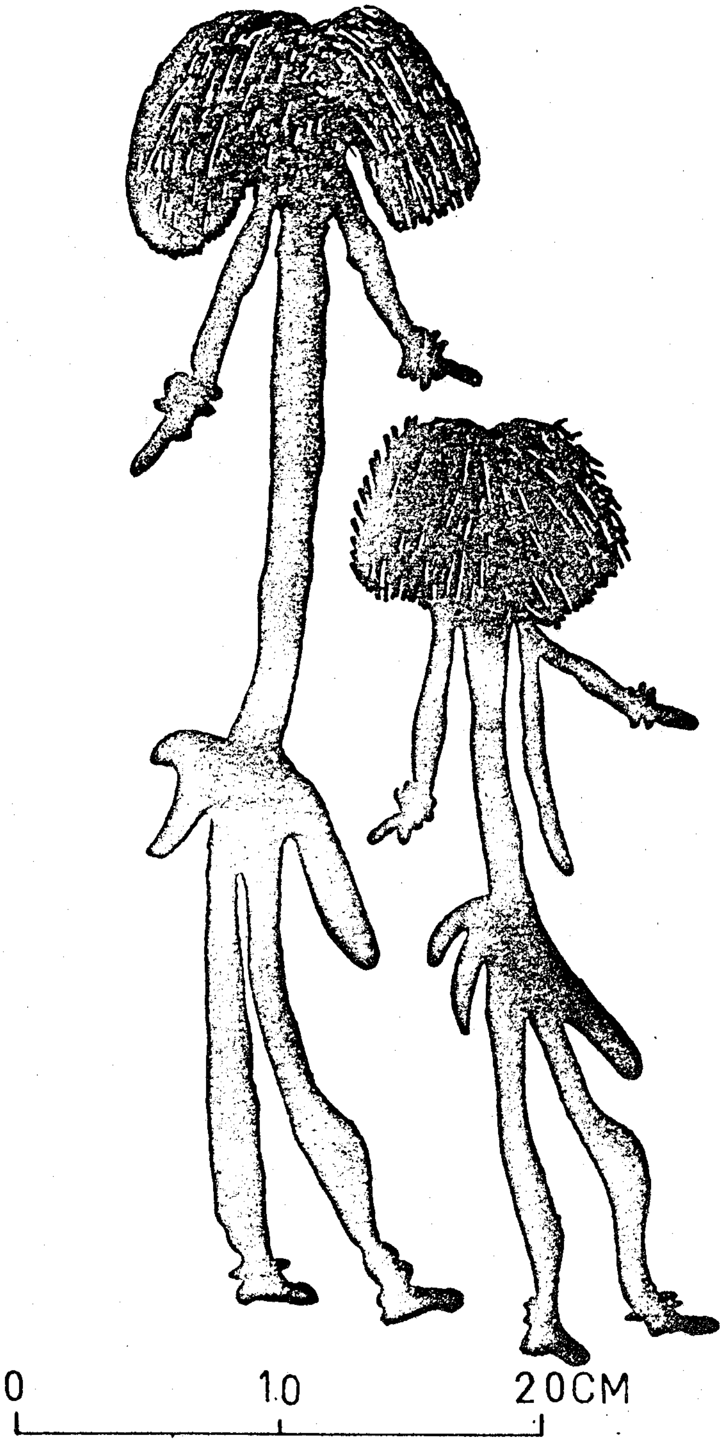

Fig. 69 Stylized silhouettes of dancing human figures from Bubu river, Kondoa, in red.

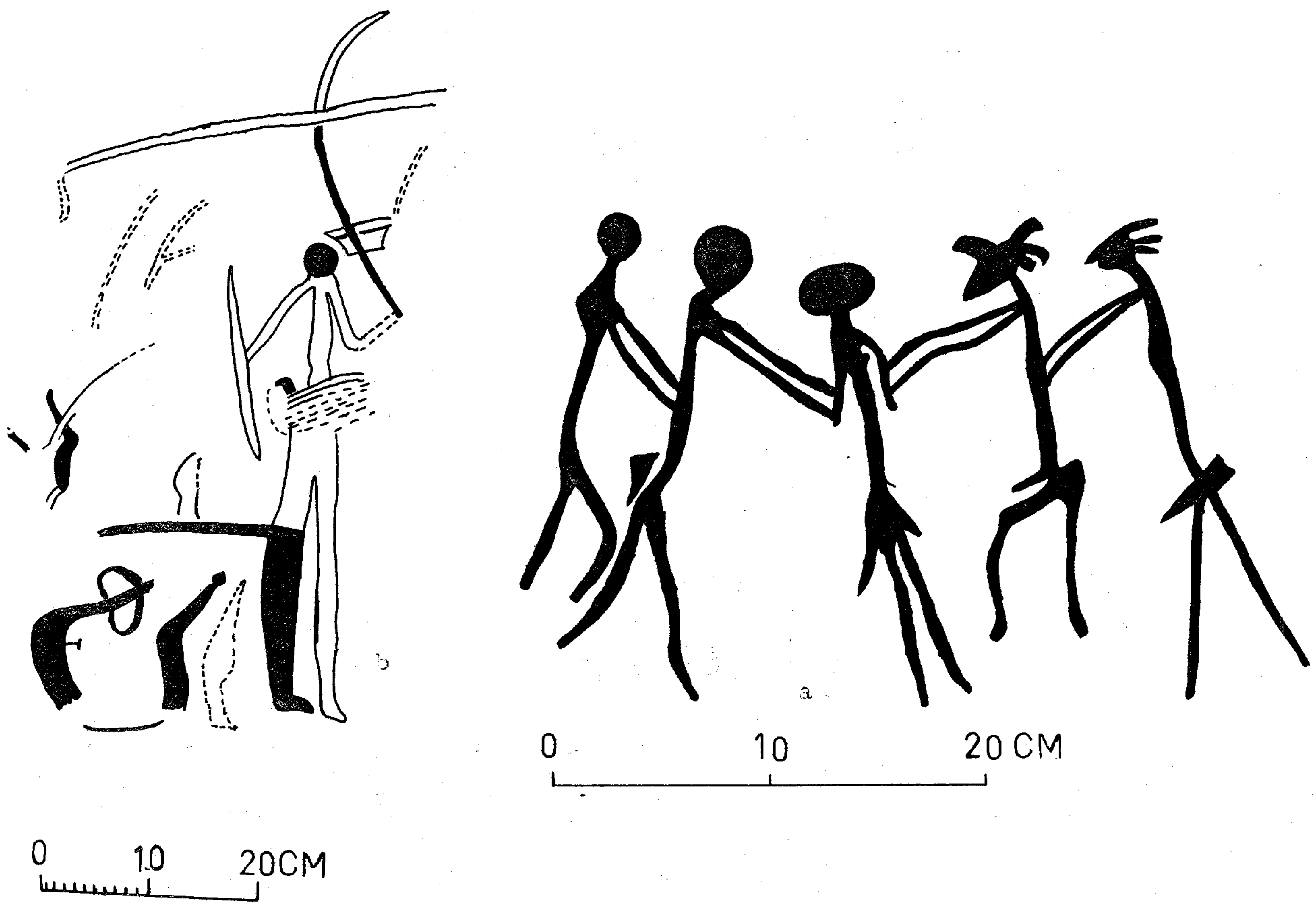

Fig. 70 Stylized human figures from Mungumi B1, Kondoa; probably depicting abduction (a) and stylized and naturalistic human figures from Lululampembele, Iramba; depicting various activities. All executed in red.

Fig. 71 Stylized human figures with exaggerated head dresses from Kondoa, executed in red.

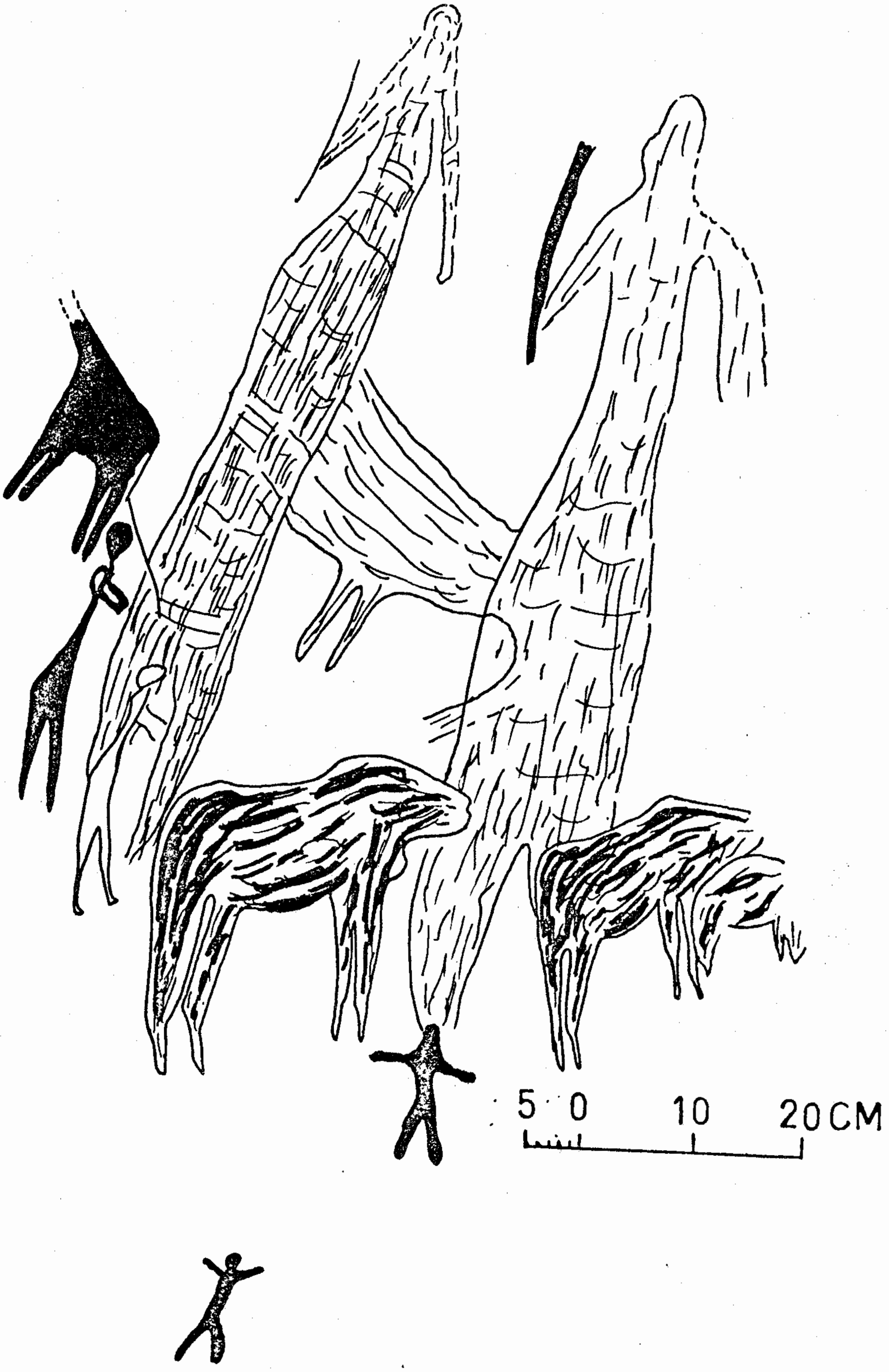

Fig. 72 Stylized and naturalistic representations of humans and animals at Mjakhuda, Singida, executed in red.

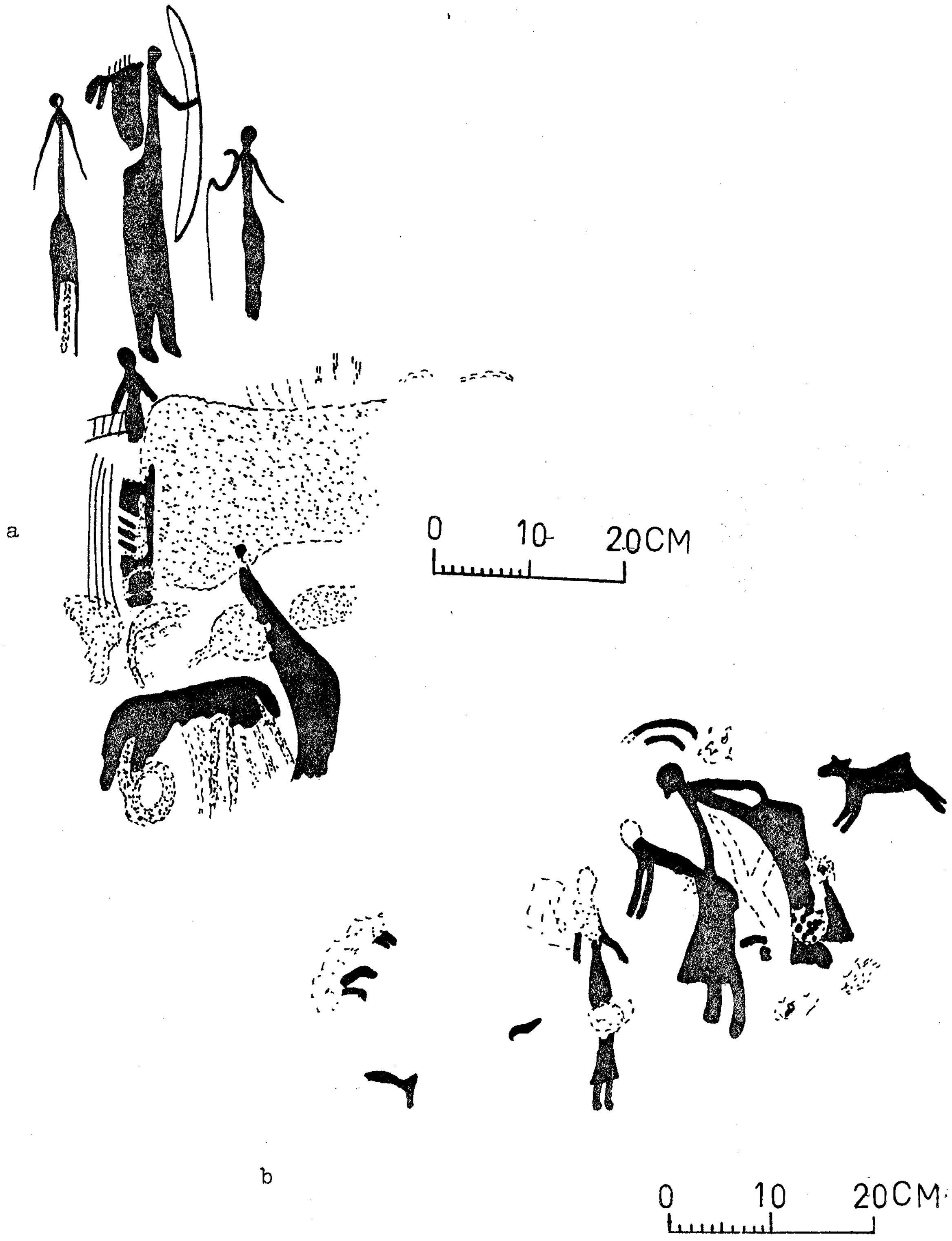

Fig. 73 Naturalistic representations of humans from Kitulu (a) and Lululampembele (b), Iramba. All are executed in red. Note that the human figures are clad and depict various activities.

2. Naturalistic Representations

In general, the representations are naturalistic or near naturalistic but there are five distinct styles and the degree of realism differs from one style to another. Many of the animals are portrayed in the naturalistic style, but very few of the human figures are portrayed in this style. A variety of animals ranging from the largest terrestrial animal, the elephant, to the small creeping lizards are represented in the rock paintings of central Tanzania. A complete checklist of all the animals pictured, will not be attempted here, but it will suffice to look at the most common.

Appendices A and B give a summary of the subject matter commonly depicted in a few selected sites. Among the animals, antelope is the most common group, and within it the eland is clearly the most frequently depicted species. However, in terms of individual species, the giraffe is by far the commonest animal represented, occurring in 70% of the Kondoa and Singida sites. Others with a high frequency in both areas besides the eland, are elephants, kudus, impalas and zebra. The frequency of reptiles appears much higher in Singida. As for carnivores, they are rare in both areas, although hyenas and other canids are presented in three shelters in Singida and one in Kondoa. Birds, other than the ostrich are also infrequent. Overall, animals are depicted in many more styles than humans.

A. Simple Open Line Outline Style (Fig. 74)

This style is used for naturalistic drawings especially of animals. Occasionally the outline may be discontinuous, but such is an exception rather than a rule. Whatever the case the finished result is an outline profile. The outline is normally done in fine red line, but orange, brown and white may be used. Outline profiles of orange and white are however considered of a distinct style. In the case of animals they may be portrayed in motion or repose and invariably in a two dimensional side view profile. While the whole outline is a realistic representation of the animal, anatomical details other than the tail, horns and ears are hardly shown. In some, only the two legs are shown. Instances of superpositioning indicate that this style comes before 2B but in other sites the order is reversed. This style in part corresponds to Leakey's Nos. 3 & 5 of the Kisese-Cheke area sequence Nos. 3, 4 and 5 of the Mungumi wa Kolo sequence (Leakey 1950), Fozzard's No. 2 (Fozzard 1959) and probably to Odner's No. 1 (Odner 1971). This style is more widely distributed in the Kondoa area where it is exclusively used for animals, but in Singida a few human figures are executed in this style (Fig. 73).

B. Double open line style (Fig. 74)

This style is very much like the preceding one except in this case the profile is done in double line outline. It has been observed in Singida as well as in Kondoa, but its frequency is rather restricted compared to 2A and is probably

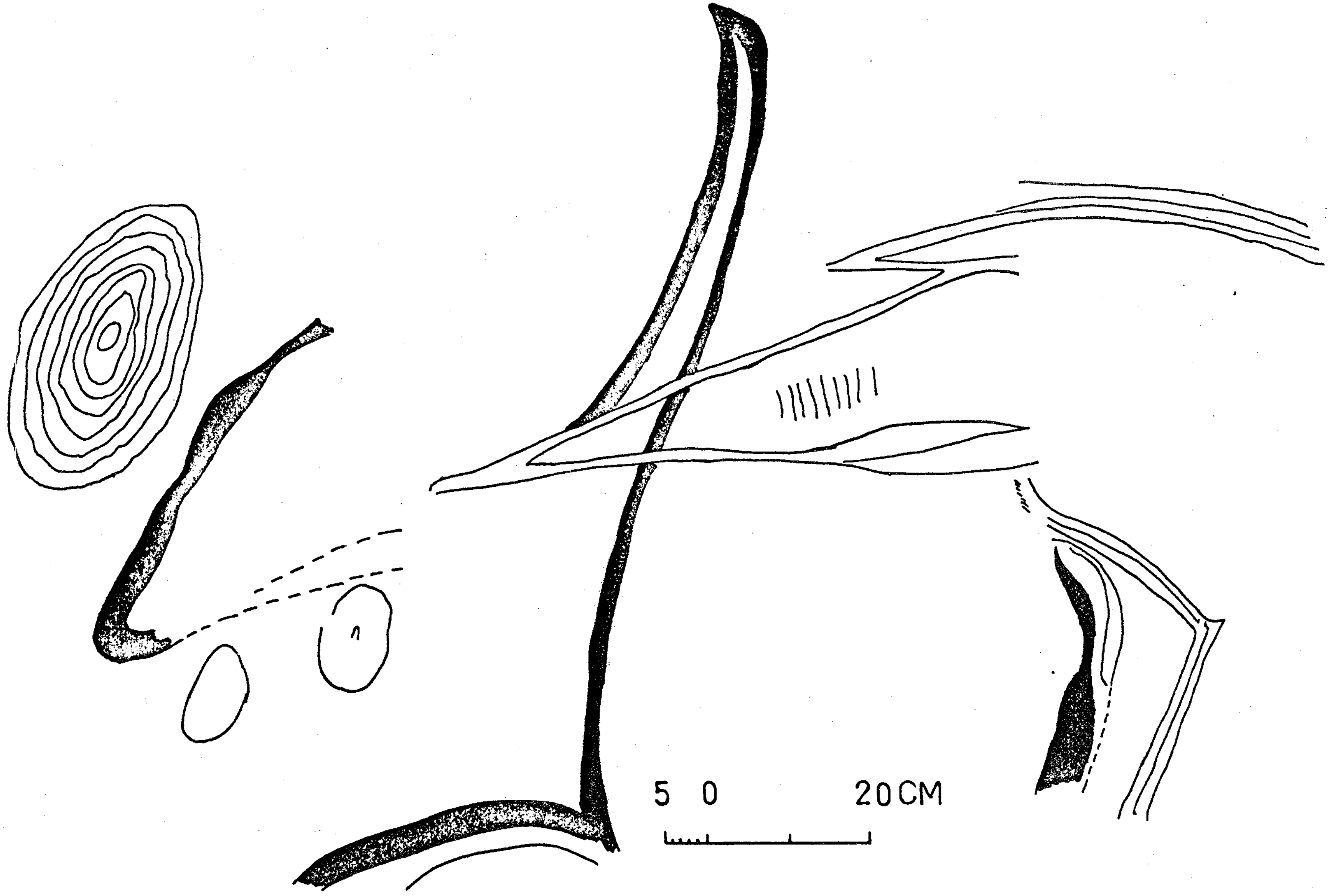

Fig. 74 Simple and double line outline naturalistic representation of an elephant and unintelligible representations from Cheke, Kondoa. Executed in red.

a variant of the latter. As has been mentioned earlier, where there is superpositioning of 2A and 2B, the order is not consistent. This makes it impossible to assign any relative chronological sequence between the two. Different shades of red are used and no instances of any other colour were discovered. Other writers do not seem to have made distinction between this style and the preceding one.

C. Red boldly filled-in silhouettes (Figs. 75-78)

This is by far the most naturalistic style, exhibiting an amazing accuracy of perceptive perception in rest as well as in motion. The infilling is a bold wash of the same red colour as the outline. Enough anatomical details are shown so that unless the representation has been rendered faint by water seepage or exfoliation of the rock, it is easy to identify the subject matter. As Leakey (1936) and Fozzard (1959) observed, the art was at its best in this and next styles. We might describe the art in thisstyle and the next as being physioplastic, i.e. truthful momentary images, as opposed to ideoplastic art, i.e., conventionalized (Boas 1955:84). The animals are depicted at rest, in motion or engaged in some activity, such as feeding, or lying down. Only a side view showing either two or four legs is shown. Sex is sometimes indicated. Overall there are many more animals depicted in this style than in any other red pigment style. Its distribution is fairly uniform in Singida and Kondoa. The few instances of superpositioning show that this style came before

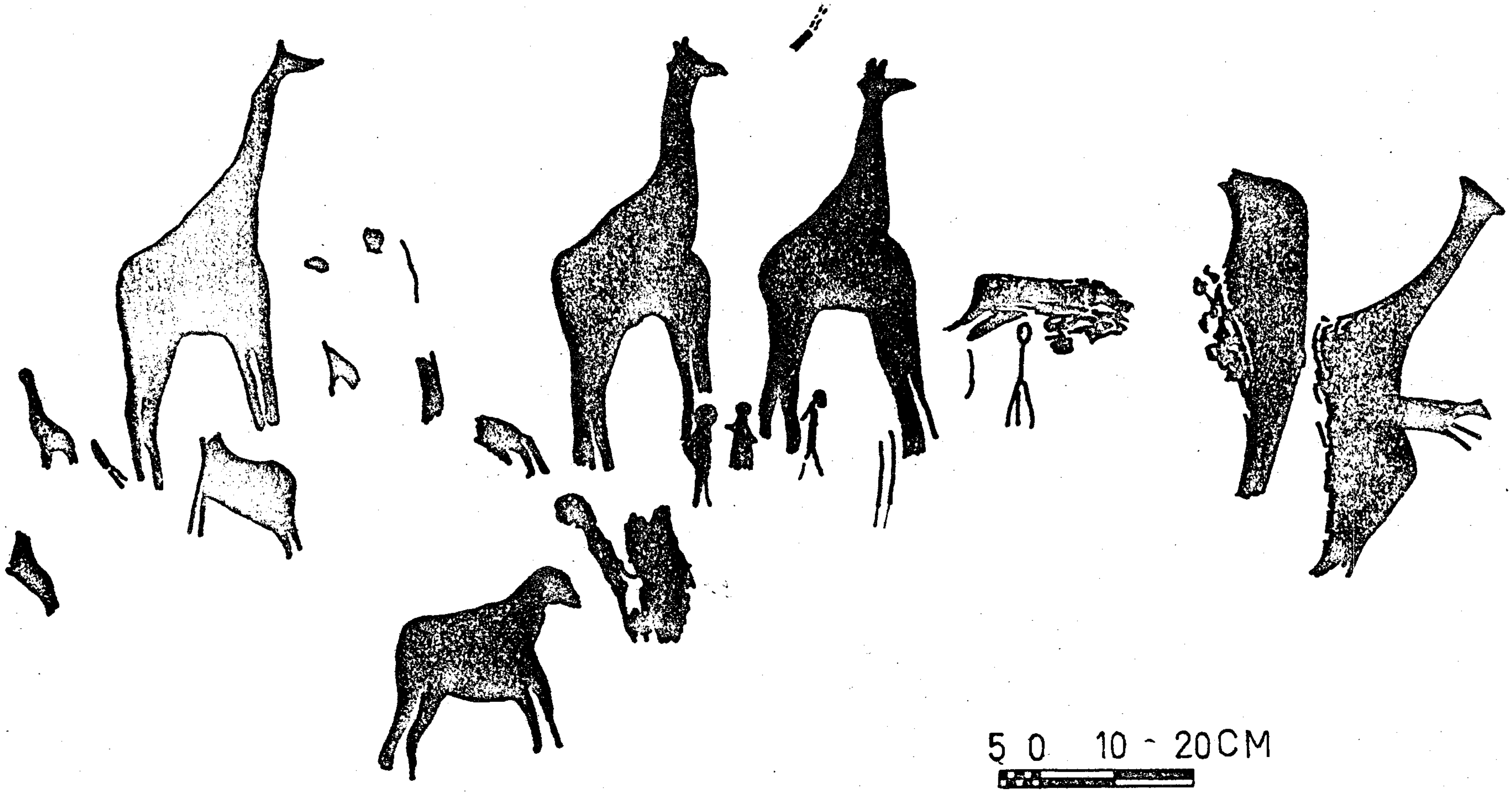

Fig. 75 Boldly filled-in naturalistic silhouettes of giraffes and other animals from Kwa Mwango, Isanzu, Iramba. All figures are executed in red.

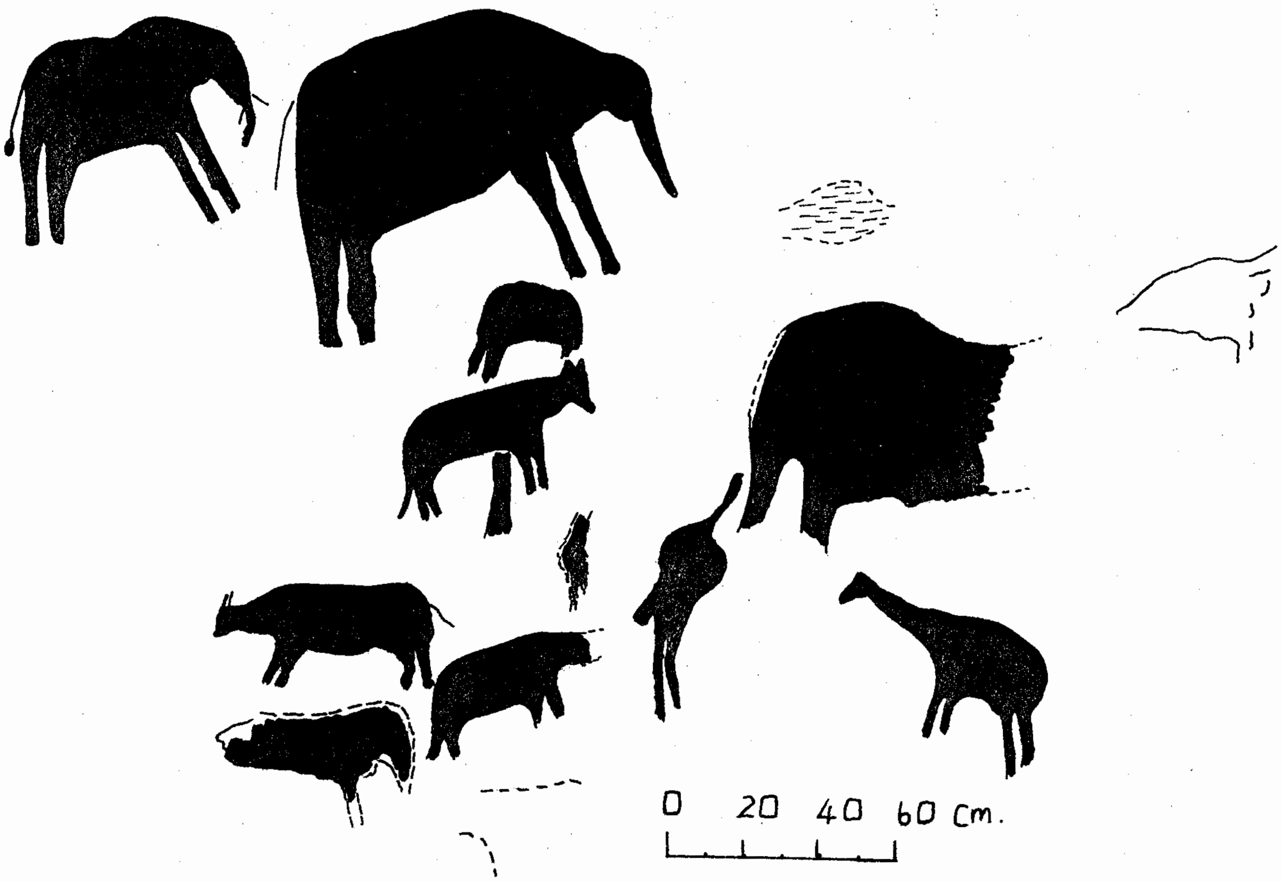

Fig. 76 More naturalistic boldly filled-in silhouettes from Taru II, Singida, executed in red.

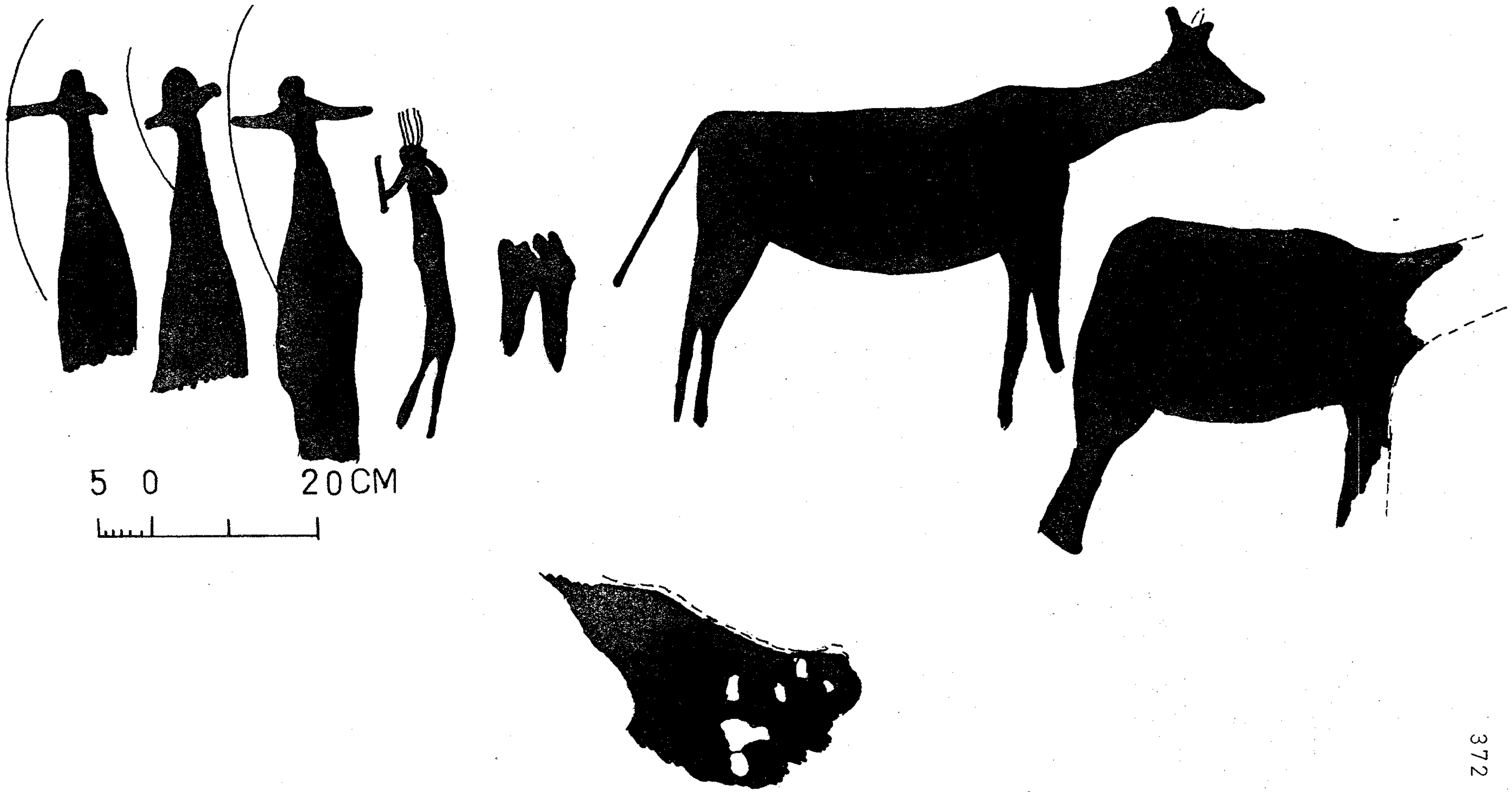

Fig. 77 More naturalistic boldly filled-in silhouettes of animals and humans from Ngimu, Singida. Executed in red.

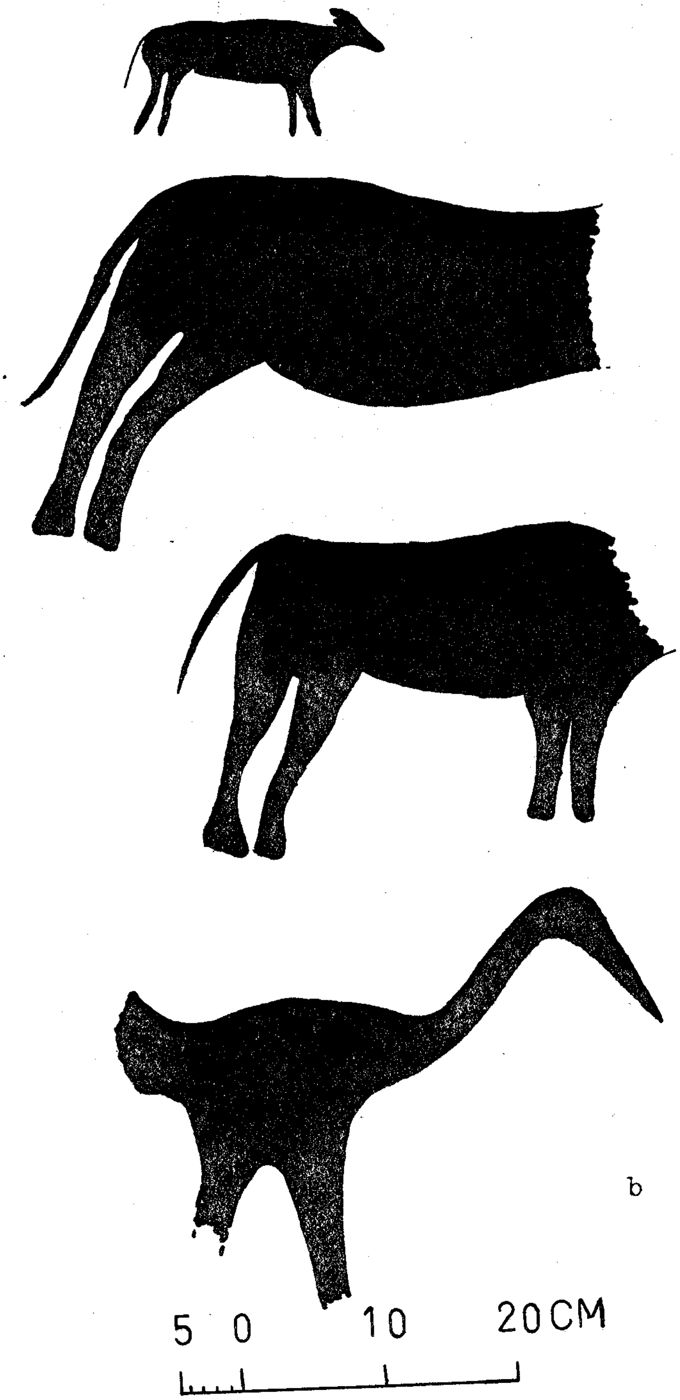

Fig. 78 More naturalistic boldly filled-in silhouettes of a) animals from a Kondoa site and b)a bird from Kinto, Isanzu. Executed in red.

the other naturalistic styles and seems to appear alongside the red thin and thick conventionalized human figure style. A few human figures especially in the Iramba (Singida) sites may be said to come under this style in the sense that they are infilled sihouettes though at the same time displaying varying degrees of schematization and lacking anatomical details compared to the animals. This style comes under group I of Odner (1971), No. 5 of Fozzard (1959), No. 7 in the Kisese-Cheke sequence and Nos. 1 and 2 in the Mungumi wa Kolo sequence (Leakey 1950).

D. Red line outline infilled with various motifs (Fig. 79-80).

Like the preceding style, it was once a very popular style in which some of the best naturalistic animals are represented, but unlike it, its distribution is less uniform, being more abundant in the Kondoa area than in Singida. Basically this style is defined by a finely executed profile outline of the animal and then infilled with different motifs in the same shade of colour. The different motifs are considered to constitute variants of the same style. Thus we have:

i) Outline shaded inside with straight lines (horizontal or vertical.

ii) Outline shaded inside with wavy or zigzag lines.

iii) Outline shaded inside with dots or circles.

iv) Outline shaded with checkers or squares.

v) Outline shaded with reticulae motifs: e.g. some of

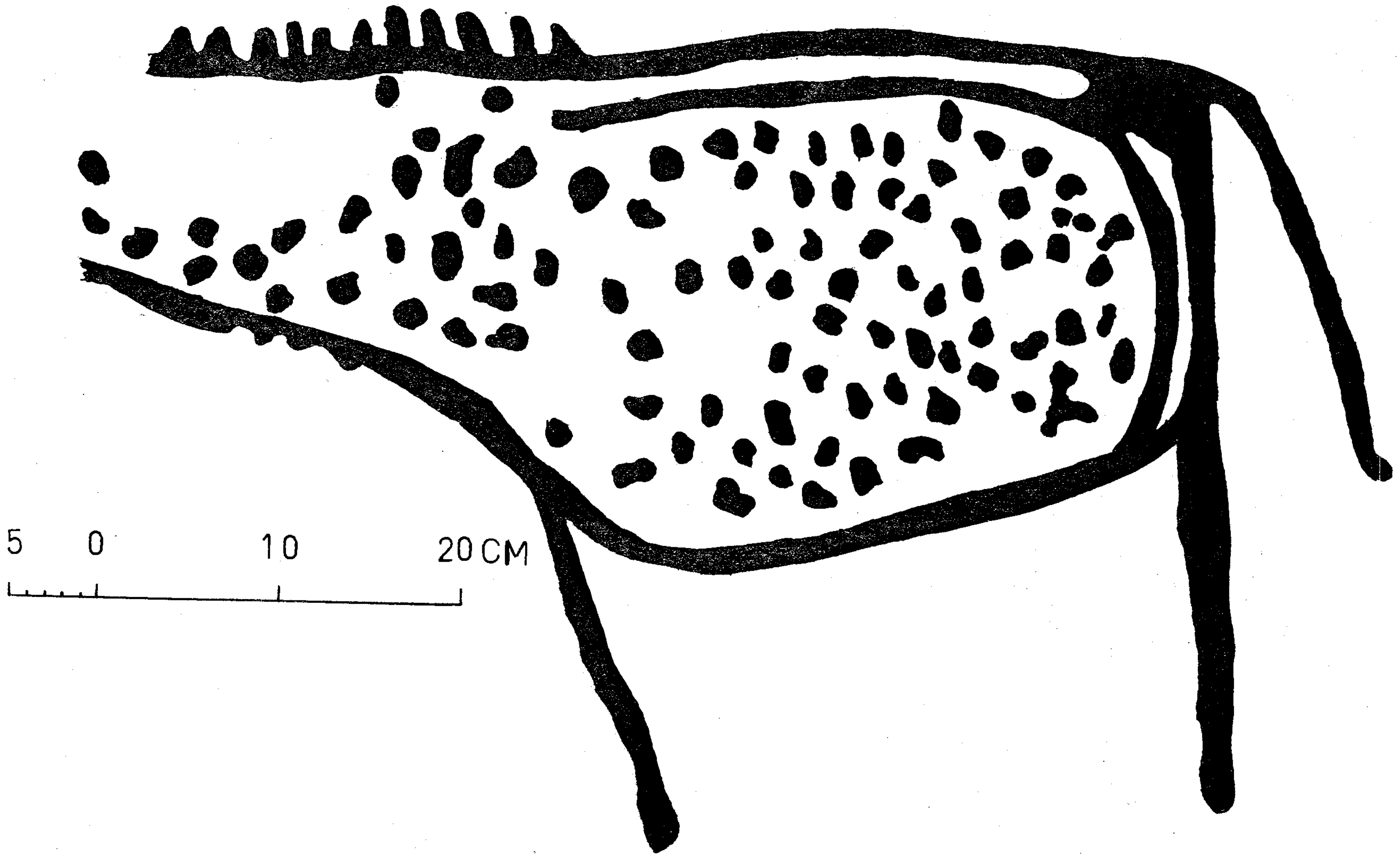

Fig. 79 Animal (?donkey) in the double and single thick line outline infilled with spot motiffs from Ikhanoda, Singida. Executed in red.

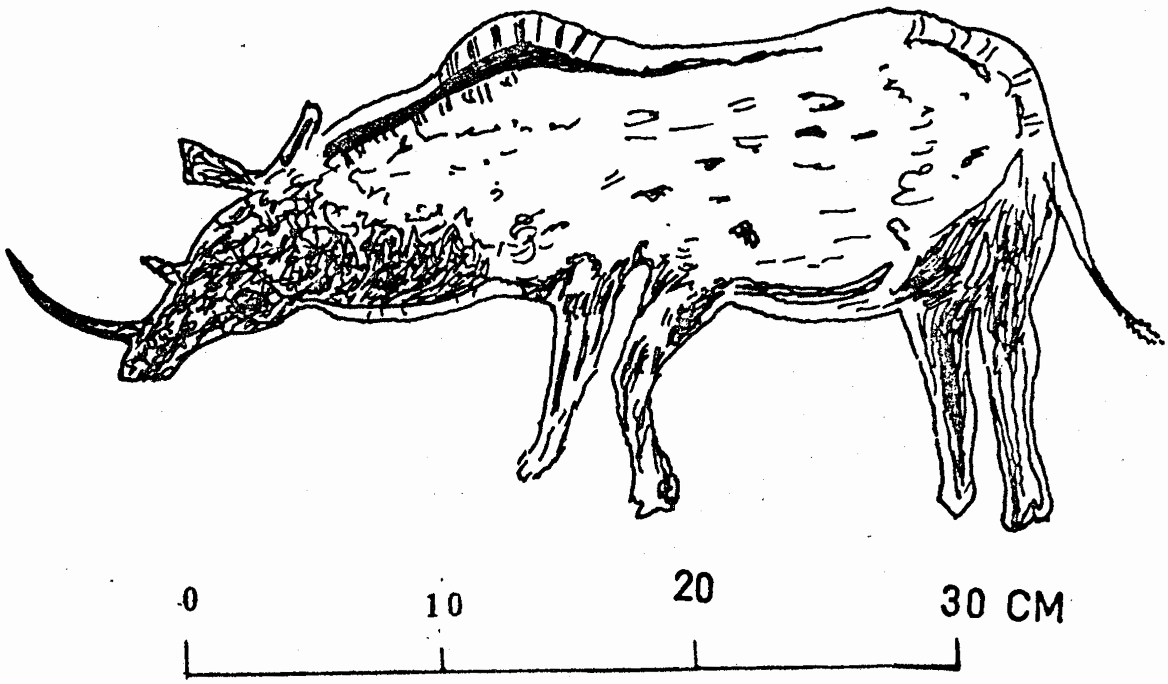

Fig. 80 A rhino in the outline infilled with various motiffs style from Tlawi D, Kondoa. Executed in red.

the giraffes. This shading is one of the most naturalistic portrayals as it is made to match the natural reticulae pattern of the giraffe.

vi) Outline with composite shading of red and occasionally orange, yellow or white. The white appears superimposed over the red and may therefore be a later addition. It is called composite because the shading is a combination of two or three of the above.

In general the pictures are well drawn and may be said to be more realistic than those of the boldly filled in silhouettes, in that an attempt has been made to portray the skin pattern of the animal. Postures range from standing motionless to feeding, running and lying down. Only the side view is shown in profile. In many examples, anatomical features such as eyes, ears, horns, mane, or tail are well illustrated. Sex organs are hardly shown, but the sex can in a number of cases be guessed from other features such as presence or absence of horns or mane, and from the relative size. No superpositioning has been detected to suggest the relative chronology between the bolding filled-in silhouettes and this style, but they are probably contemporary. This style corresponds to No. 5 of the Kisese-Cheke sequence (Leakey 1950), No. 4 of Fozzard's sequence (Fozzard 1959) and under group I of Odner (1971).

3. <u>White Semi-realistic Silhouettes</u> (Figs. 81, 82, 83)

This is a very prolific style representing both human figures and animals. It is predominantly naturalistic but some element of stylization is present. The paintings are executed in various shades of white and filled-in with either a thin wash or a thick paste of the same colour. Unlike the red filled-in silhouettes, the finished piece of art is generally poor. The outline profile is not sharp and the paint is allowed to flood outside the profile, thus giving the picture a rather dull and indistinct outline. Different shades of white ranging from a thick rather oily paint to thin water colours seem to have been used. Woodhouse (1970:85) has reported that this style is also found in the Transvaal where it is not considered typical "Bushman" but attributed to the Bantu. Unlike 'Bushman paintings' the edges are not sharp and clear, but somewhat fuzzy. The legs of the animals are not elegant but stumpy and incomplete.

It is obviously one of the later styles as reflected by the subject matter which for the first time depicts domestic animals such as cattle, sheep and dogs, sometimes portrayed in direct association with human beings, e.g. the picture of the human figure dragging a sheep at Mguguno, Isanzu Singida (Fig. 82). Leakey (1950), Fosbrooke (1950) and Fozzard (1959) have referred to this style as the "Late White." In instances of superpositioning this style generally overlies the red (Fozzard 1967:57). There are hardly any scenes of hunting

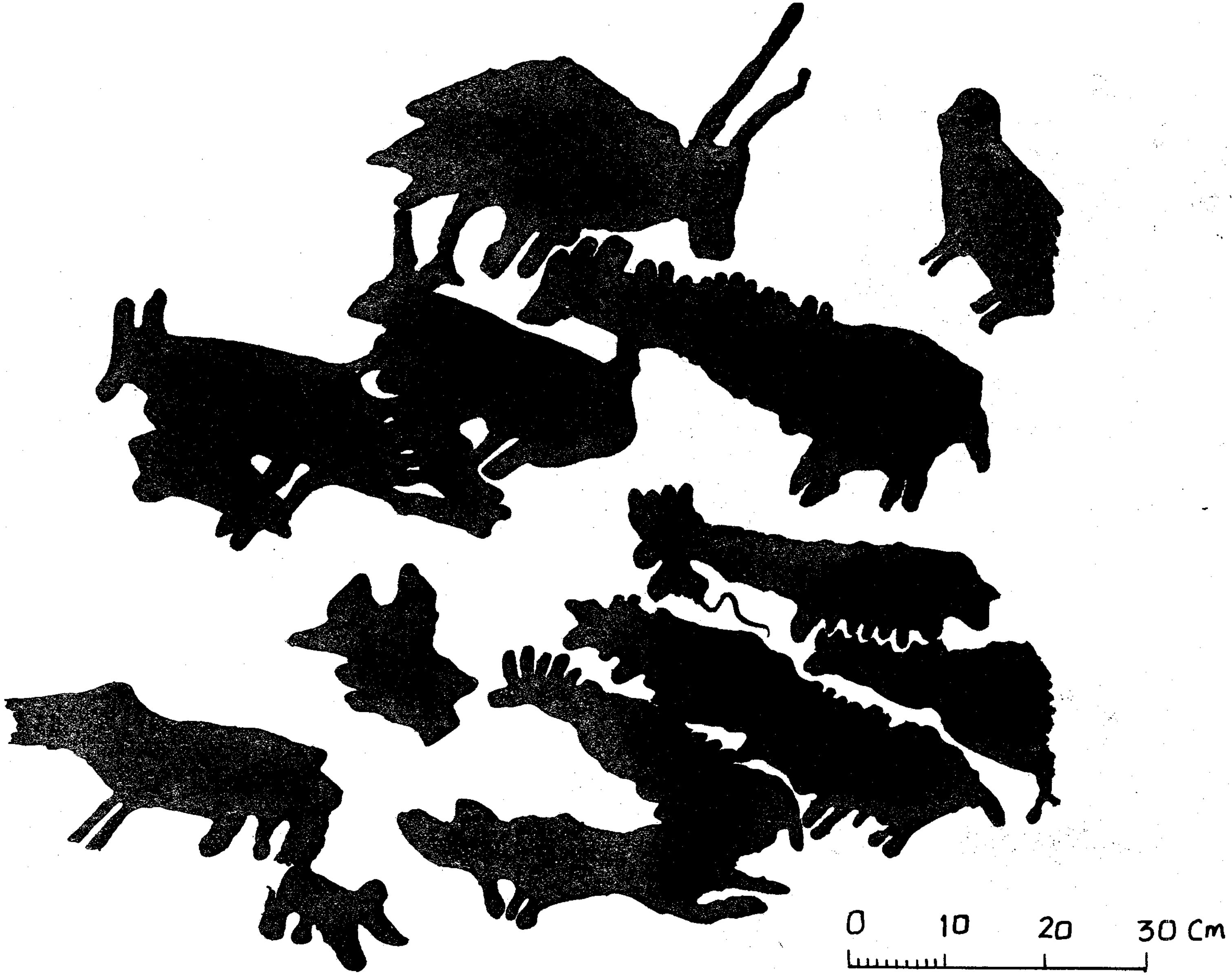

Fig. 81 White and naturalistic silhouettes of animals from Mguguno, Isanzu. Executed in white,

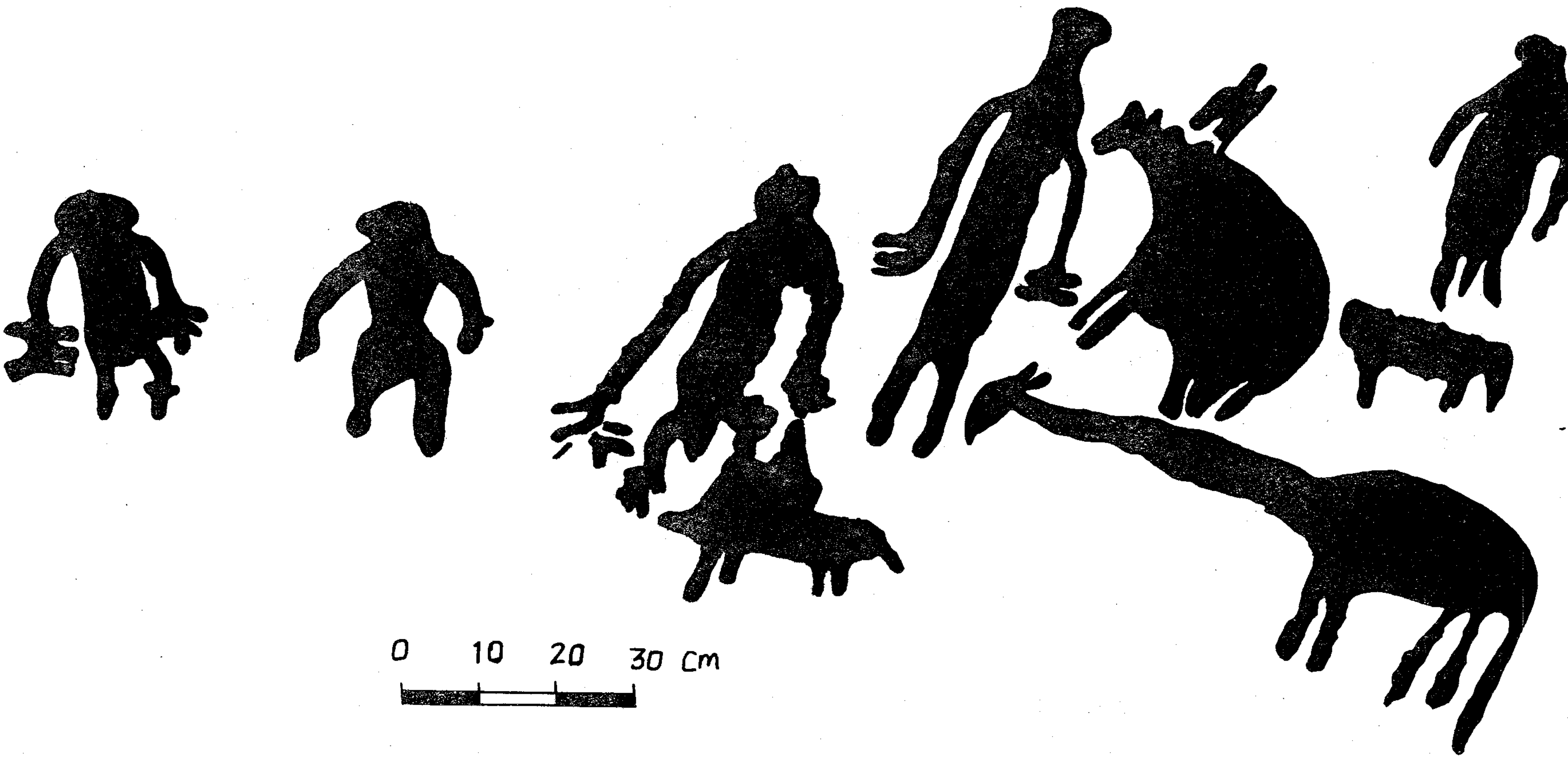

Fig. 92 More white semi naturalistic silhouettes of animals and humans from Mguguno, Isanzu.

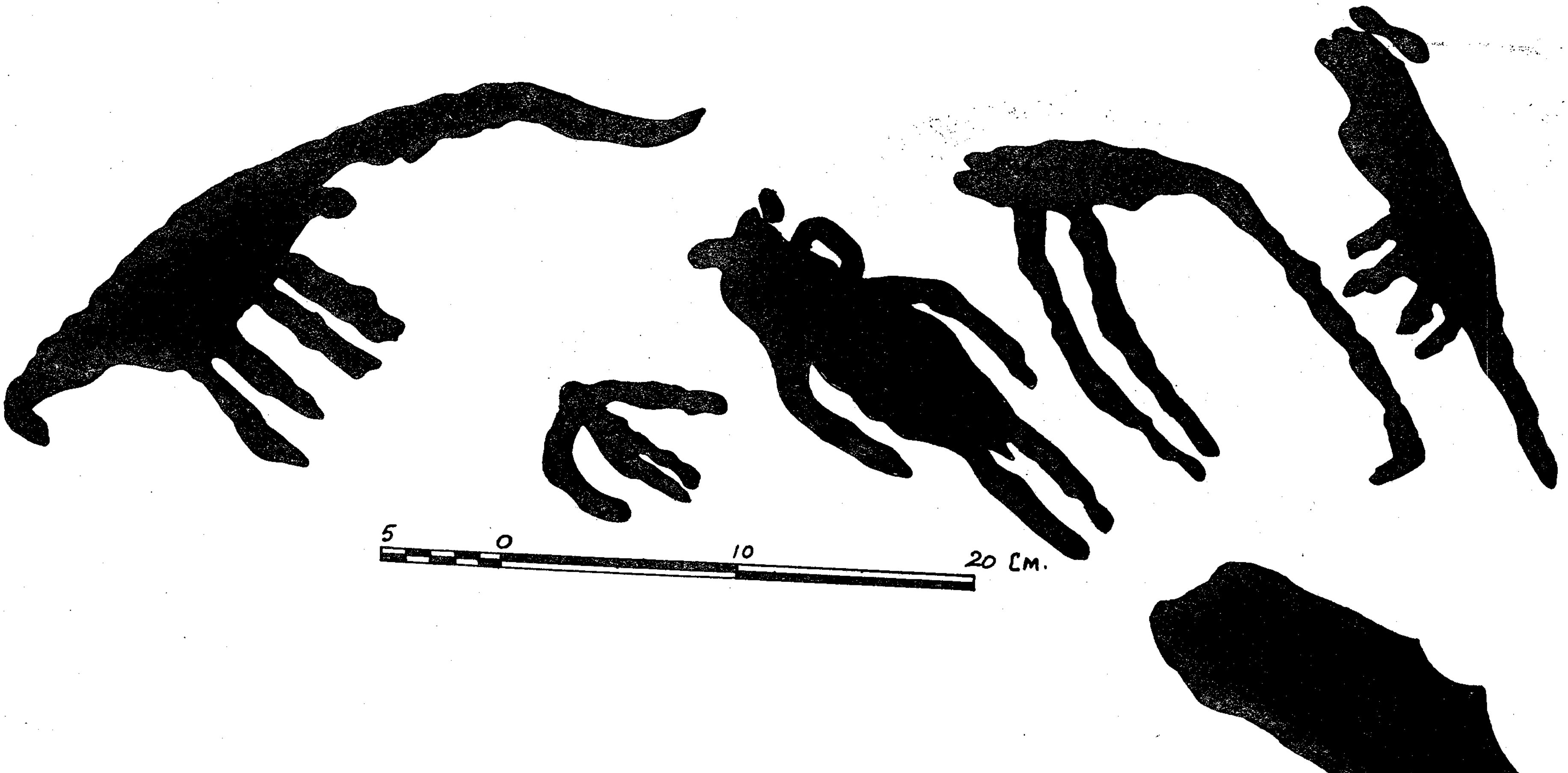

Fig. [illegible] More white semi naturalistic silhouettes of animals and humans from Kirumi Isumbirira, Isanzu.

depicted in this style. Perhaps the idea was simply to show the prolific diversity of the local fauna.

The human figures are generally more poorly drawn than the animals, lacking both anatomical features as well as proportion. The trunk is represented by what seems to be a careless stroke of a thick brush. The legs and arms are thick and fuzzy and appear unfinished, while the head is sometimes joined to the shoulders. Overall, this style seems to be more widely distributed in Singida, especially in the Isanzu area and as Odner (1971) has observed, is associated more with deep caves than open rock shelters. This style is comparable to Leakey's No. 11 of the Kisese-Cheke area sequence and No. 10 of the Mungumi wa Kolo sequence (Leakey 1950:16-18); Fozzard's No. 5 (Fozzard 1959:94) and Odner's group III. Occasionally there are paintings done in black but since such instances are few and their mode of execution comparable to the white paintings, they are included within this style.

4. Abstract and Geometric Figures (Figs. 84-88)

In an earlier publication, Masao (1976) referred to representations which do not fall into any of the preceding three stylistic categories under the rubric of non-outline styles. The subject matter is so varied that it defies proper description. Basically these are representations of different geometric motifs of lines, circles, squares, dots and non-geometric signs and symbols. They are more commonly done in white but examples of orange, brown, red and black are also found. The more common geometrics found are simple lines, crosses, checkers, ladders, U's and circles. The abstract include dragon-like pictures, symbols and dots. They are found uniformly distributed in Kondoa and Singida. Of the symbols, the most frequently found is the so-called "sun-symbol" - a circle or concentrics with radiating lines, sometimes also known as the "circle and rays". Reports indicate that this symbol has a wide distribution, occurring not only in central Tanzania, but also in Masasi in the south, Chunya to the east of Lake Rukwa, Makolo in Unyamwezi, Bukoba and Mwanza (Collinson 1970:59). Other symbols are the hand prints, and the comb-like representations (Figs. 85, 87).

There are other portrayals which are apparently neither animals, nor geometrics. For the most part these seem unintelligible and for want of a better word, they have been referred to as mythicals or dragons; e.g. the picture at Kandaga A9. (Fig. 85). On the contrary they are perhaps a form of abstract art, akin, shall we say, to modern creative art? These enigmatic art forms are referred to as "formlings" by Frobenius, "tectiforms" by Jones and "cryptomorphs" by Willcox (Cooke 1969:41-42; Willcox 1963:37). Finally, tree-like drawings in both black and white have been reported from Suka Mahela (Manyoni) and Fenga Hill (Kondoa) but not from Singida (Masao 1976:3; Fosbrooke 1950). There are also unintelligible paint patches usually in white but also in other colours, perhaps resulting from wiping hands and

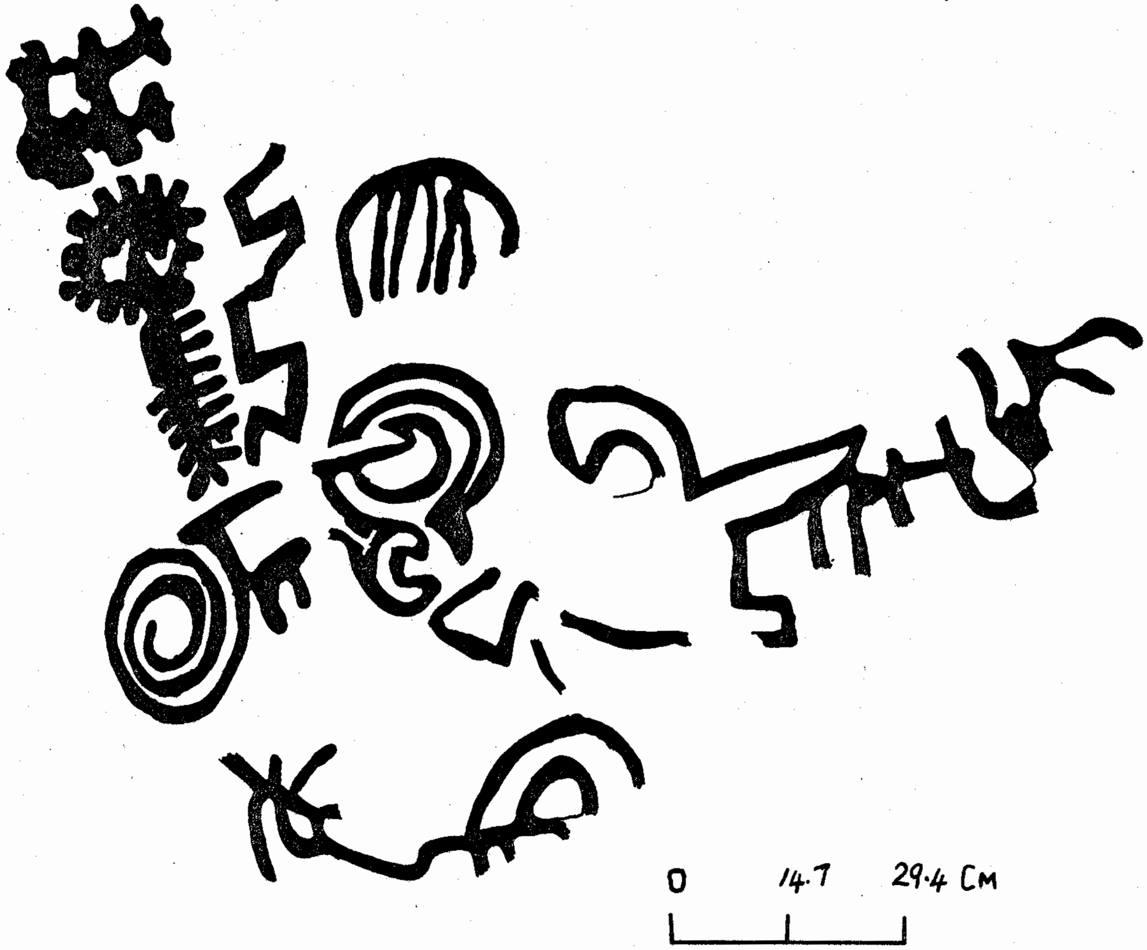

Fig. 84 Symbols and geometrics from Pahi Rock shelter, Kondoa.
Executed in white.

Fig. 85 Symbols, geometric and enigmatic forms from Kandaga A9, Kondoa. Executed in white, orange and red.

Fig. 86 Geometric designs (lines and circles) from Mtula, Isanzu.
Executed in white and orange.

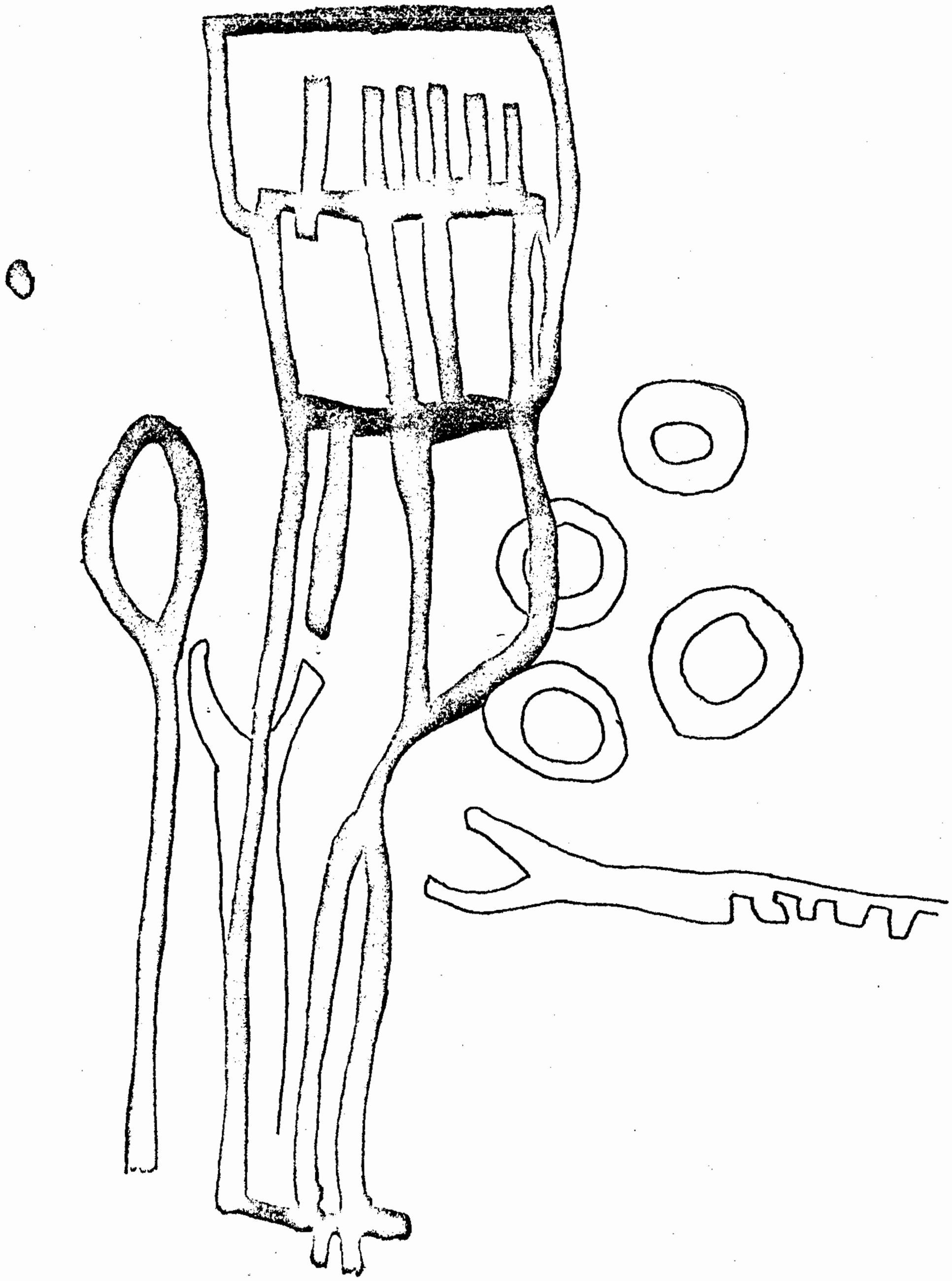

Fig. 87 Geometrics and symbols from Isanzu, executed in red and white.

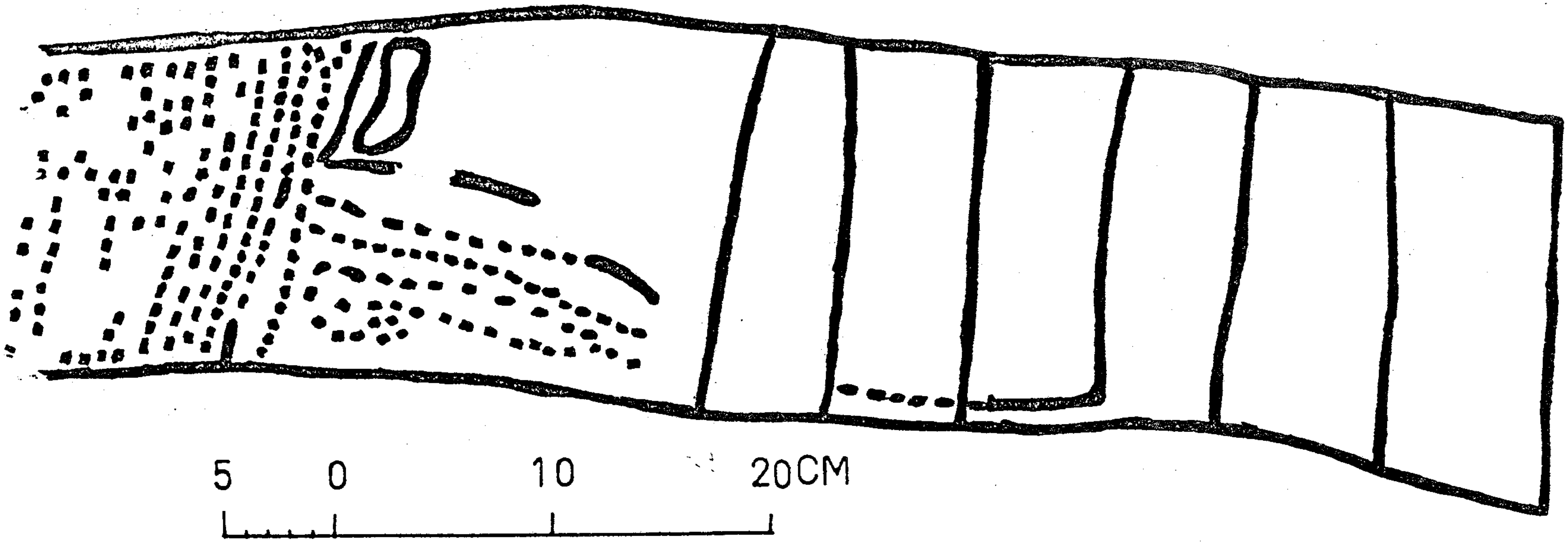

Fig. 88 Geometric representations from Munyeti, Isanzu, Iramba. Executed in red.

fingers or the paint brush off the rock panel. This style is included under group III of Odner's (1971) sequence and No. 12 in the Kisese-Cheke sequence (Leakey 1950). Like the semi-naturalistic white style, it appears to be later than either the naturalistic silhouettes or the red stylized human figures on the basis of sequence of superpositioning.

Petroglyphs (Fig. 89)

No rock engravings other than the scooped depressions reminiscent of the "bau" game (Chapter 1) and the rubbed figures at Ilungurampepo were discovered. However, a few engravings have been seen in Usandawe and Tambala (Kondoa District). Fosbrooke (1950:22) does not discuss the details of the technique employed but mentions that the breadth of the lines suggests that the South African pecked or hammered out technique rather than the delicate line engravings may have been used. However, the figures at Ilungurampepo appear to be the work of children rubbing animal impressions on the rock panel by using pebbles and small pieces of rock. Another occurrence has been reported from Engaruka (Masai District) by Fosbrooke. Petroglyphs are equally rare in other parts of Tanzania.

Summary of Styles

In very few cases is superpositioning of styles a reliable indicator of relative chronology. The order of superpositioning is so inconsistent that other than the white semi-naturalistic

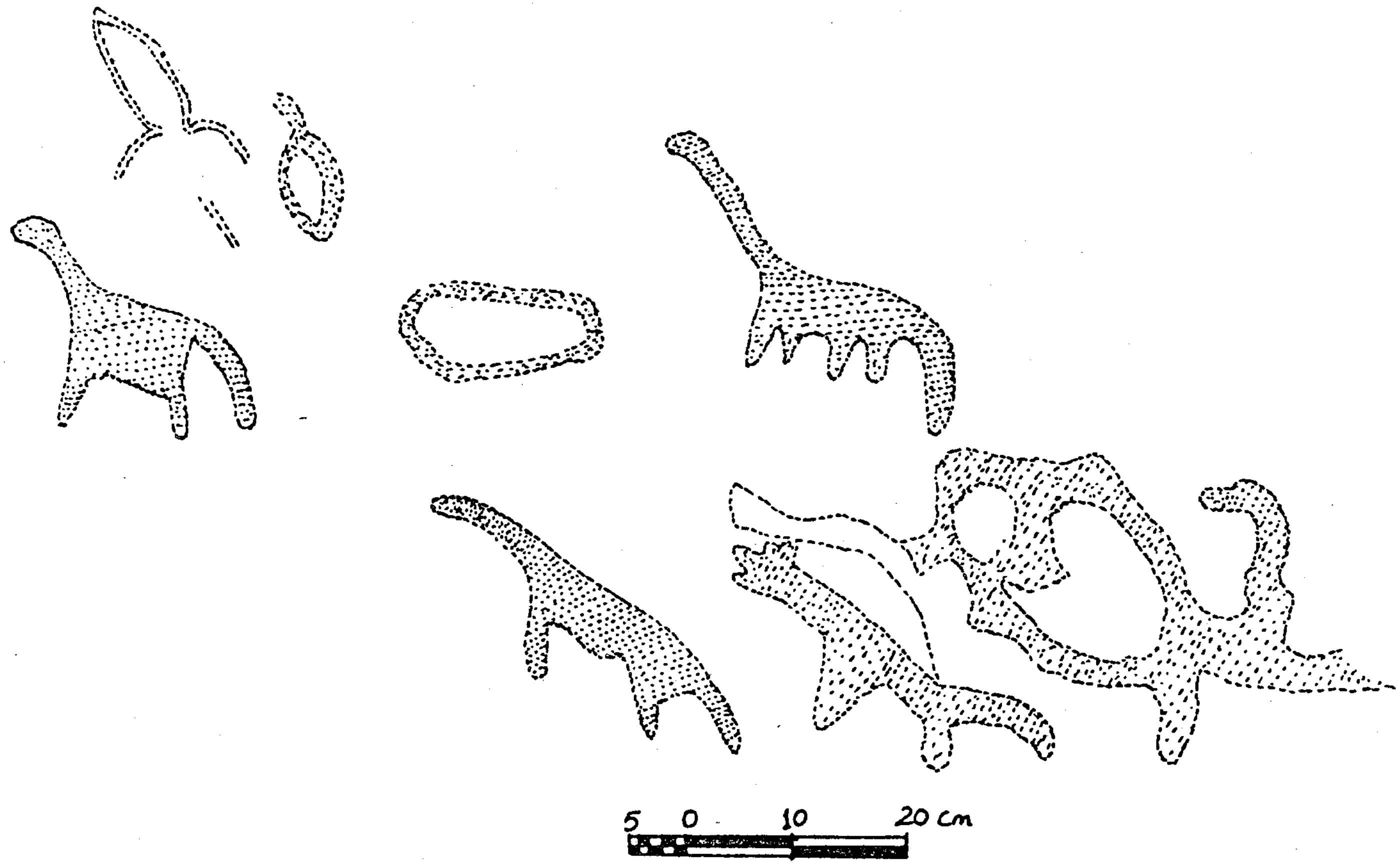

Fig. 89 Petroglyphs of animals and unintelligible forms from Ilungurampepo, Isanzu, Iramba.

style which in all cases overlies every other style, no general statements can be made about the relative age of the others. In Zambia, Rhodesia and South Africa, the white style of crude animals and geometric patterns and designs is not only considered the latest, but also attributed to the Bantu while the earliest styles are the work of the Bushmen (Rudner and Rudner 1970:172; Woodhouse 1970:85; Cooke 1969). In Tanzania, this style has a wider distribution than any other, suggesting, inter alia, that the people responsible for this style were more wide spread in Tanzania than the people responsible for the earlier styles.

The styles suggested here correspond more to those suggested by Odner (1971) for the Iramba rock paintings and Fozzard (1959) for the Usandawe paintings, and much less to Leakey's detailed stylistic sequence based on the Kisese-Cheke area and Mungumi wa Kolo sites in Kondoa. On the basis of pigment used, scenic association and the lack of any consistent order of superpositioning, styles 1, 2 and 3 would appear more or less contemporary although 1 and 2 may have come earlier in some sites. Although this is only a speculation, it seems to be supported by the fact that there are a number of shelters, especially in Kondoa where style 1 and 2 appear alongside one another and associated in the activities depicted, for example human being in style 1 hunting animals in style 2. If this is true, then style 3 in which the animals are a semi realistic momentary expression is a direct derivative of the boldly filled-in silhouettes of style 2.

In summary therefore we may group the rock art of central Tanzania into four broad relative chronological phases.

I. Red conventionalized schematic human figures and naturalistic filled in animals. The pigment varies from vermillion to scarlet red.

II. Naturalistic animals executed first in open line outline profile and then infilled with various motifs, the latter sometimes matching the natural skin pattern of the animal. A few semi-naturalistic human figures sometimes depicted with a loin cloth also occur. Red is the predominant colour but a few examples of brown and white are also found.

III. White semi-naturalistic silhouettes:
A very prolific art style in which animals and human beings are executed in various shades of white. Sometimes domestic animals are shown in this style. Overall the finished piece of work is rather poor. Black pigment may be used, but rarely. This style appears more wide spread in deep caves in Singida than in Kondoa.

IV. Abstract and Geometric styles.
Lines, circles, dots, squares hand and finger prints and enigmatic motifs are executed predominantly in white and may therefore be contemporary with III or later. This style has never been reported to underly II and is definitely later than II. Orange, yellow and brown are also used.

Theories of Interpreting Rock'Art

The art of any people, may be viewed like any other aspect of culture, as a body of habits, beliefs, practices and products passed on from one generation to another. New elements enter the artistic stream from time to time, by developments from within and by borrowings or diffusion from without. Old elements are superseded to be forgotten, lost or regarded as passe (Newcomb 1967:15). This may tempt us to make biased judgements describing the art as being sophisticated or decadent as we see it, or to use an ordinal scale in comparing different peoples' art. Above their face value, such statements are anthropologically meaningless, for art serves the culture or civilization of which it is a part. As Newcomb (1967:16) has observed:-

> One people may have been inspired to paint their pictures for magical or religious reasons, another to commemorate successful hunts, still another as an ideal pasttime. As the motivation differs, so too, will the artistic expression. Looked at this way, evaluation of one artistic tradition by the canons of another becomes absurd and meaningless..... Comparisons are important and analytical investigations of rock art are solely needed, but it is impossible to objectively evaluate art apart from the culture of which it is a part.

Art is but one of the parts in the cultural systemic whole, and like any other aspect of culture, it is responsive to and affected by the other segments, as in turn it affects them. It is a reflection of the physical and cultural world of the people. An art form such as rock paintings, may then be viewed as one of the means by which a people interprets experience as well as a reflection of that experience.

Two differing schools of thought have dominated the interpretation of prehistoric rock art.

A. Sympathetic Magic (Magico-religious)

The concept of sympathetic magic is based on the premise that "like begets like" or in other words, an effect resembles its cause. It is argued that the depictions of particular animals were motivated by the desire to control the real animals of which the depictions are the pictures of. Injury done to the picture would engender corresponding injury to the subject (Vinnicombe 1972:124). For the same reason, so the argument runs, there is a paucity of 'dreadful' animals such as leopards, represented in the rock art since their representation is in some sense their creation (Brentjes 1969:7). Stories of myths and legends of rituals involving drawing the picture of an animal on the sand and shooting an arrow at it before the men set out to hunt have been reported from Kalahari and Congo-Kasai by Frobenius (Breuil, et al. 1965:260-261), and Brentjes (1969), while Ucko and Rosenfeld (1967:124) report similar practices in the North American Indians. The Northwest Coast Indians for instance painted and engraved human images which are supremely shamanistic. The bar ribs stylistic element always seen in the Northwest Coast is also associated with shamanism for the rib structure may symbolize dead people. The latter served as guardian and gave the specific powers of clairvoyance and prophecy associated with the shaman (Hill and Hill 1974:270). There are other representations meant to bestow supernatural powers over the inhabitants of the sea, to attract salmon or facilitate the hunting of whales (Hill and Hill 1974). In Spain and France the art was also inspired by magic. Art for art's sake did not exist in those days "for such a conception of art must have been the invention of men on a higher plane of cultural evolution" (L'hote 1958: 61). In North Africa and South Africa pictures of masked men have been interpreted as wizards (L'hote 1958; Brentjes 1969).

The concept of magic is interwoven with that of ritual and religion, both of which are based on beliefs which are not explainable by natural or physical means. There are obviously philosophical distinctions between religion and magic but there is no intention to dilate upon this here.

Following the publication of Sir Edward Tylor's 'Primitive Culture' in 1880, religion was understood as a belief in ancestor cults and totemism was explained as simply an extension and a particular form of ancestor cults. It was argued that since primitive peoples made little distinction between man and animals, representations of animals on rock shelters were a form of totemism (Ucko and Rosenfeld 1967:121). Under the influence of the new ethnographic knowledge, Reinach who had regarded European Palaeolithic art as a luxury activity espoused to the magic view of rock art interpretation. In 1880 he argued that Palaeolithic art was an evidence of sympathetic magic, incorporating an aspect of hunting magic and fertility magic. This seemed to explain why the artists took the trouble of painting on difficult to reach caves and dangerous cliffs (Ucko and Rosenfeld 1967:123-124).

The Abbe Breuil tried to incorporate other features of Palaeolithic art into the sympathetic magic interpretation. For example he pointed out that representations of carnivores in no way conflicted with totemic interpretation for there are not only people who seek possession of an image of their quarry to ensure success in the hunt, but also who on the contrary, expect to gain the qualities of a predator through its image and in this way be endowed with its skill in killing game (Ucko and Rosenfeld 1967:130).

Another aspect of sympathetic magic is the "sexual symbol", a magic intention to increase not only the number of animals but also of human beings. On the other hand, representations of masked or half-human and half-animal were interpreted as priests, sorcerers, or spirits of disguised hunters. Humanized animals were ascribed to totemic beliefs and to the concept of animal ancestors of particular clans. For instance it has been reported that the Bushmen believed that men could change themselves to beasts and vice versa (Brentjes 1969:37). Some Bushmen mythologies seem to support the magico-religious interpretation of some of the rock art. Representations of men with antelope heads are explained as being the dead who were deemed to be leading a second existence somewhere else, either in the mountain or under water. Water cults and the belief in a rain cow played a great part. In some Bushmen folklore for example, the mantis is the most mythological figure. In Rhodesia, Cooke (1969) has reported a practice of throwing stones at rock painting shelters as a magical or ritualistic performance to make rain. Practices of regal sacrifice in moon cults are also associated with rock art (Brentjes 1969:15,26,28; Cooke 1969; Rudner and Rudner 1970: 205-209). A symbol of fertility is also seen in the case of the painting of a virgin girl being sacrificed to cause it to rain (Cooke 1969). Some of the anthropomorphic depictions have been interpreted as representing divine or semi-divine supernatural beings (Anati 1968:184).

The concept of sympathetic magic has been espoused too readily and wholesale even when there was no apparent symbolism in the art. Cryptic petroglyphs and pictographs, for example, are accounted for by invoking sympathetic magic or mythical explanations but like the symbolic art, they are probably the product of a very personal imagination, and as such we have no way of interpreting such forms (Cox 1970:67).

While some of the rock art undoubtedly is associated with magico-religious practices, it is a mistake to push this kind of interpretation too far. Critics view sympathetic magic as an insignificant and somewhat trite expression of religion, and argue that by dwelling on the magical or aesthetic aspects of the art, we are detracting from the far more complex and sophisticated ideas which form the basis of the artists beliefs (Vinnicombe 1972:129; Willman 1968:64).

As was pointed out earlier, adherents of this school of thought have unscrupulously adopted ethnographic parallels to explain prehistoric art found elsewhere. The naive use of these parallels by earlier writers such as Reinach and Breuil who gleaned the concepts of totemism, symathetic magic and fertility rites from the Australian literature and applied them wholesale to the art in the Franco-Cantabrian caves was rejected by later researchers such as Laming and Leroi-Gourham and properly rebuked by Ucko and Rosenfeld (1967:123-188; Maynard 1974:5). Maynard (1974:6) further warns that any attempt to infer the meaning of significance of prehistoric art in Australia or elsewhere by the uninformed observer should be discouraged for he has "no chance of accurately deducing any aspect of the meaning of a figure, or even of determining its correct zoological identity, let alone gender."

B. Art for Art's Sake; Commemorative Art

"Art for art's sake" is a counter interpretive theory maintained by a different school of thought from that one of sympathetic magic. Along arguments for "art for art's sake" are included those arguments which interpret rock art as simply commemorative art.

"Art for art's sake" implies that human beings have an inherent and instinctive desire to express themselves artistically, an endeavour by the artist to record scenes and events, but more often a scene of beauty remembered for its aesthetic qualities (Vinnicombe 1972:126). It is argued, for instance, that if the artist had been interested in the animal purely as food, then a simple outline drawn to the accompaniment of an intoned prayer would surely have sufficed to bring the desired injury to the animal. Such ceremonies would hardly have required the accurate attention to details seen in so many of the paintings. This lends strength to the contention that at least some of the paintings are an expression of art for its sake. Indeed, if one wants to kill a kudu or a wildebeest, it is scarcely necessary to draw several in different positions or a whole family (Brentjes 1969:14).

Art may have started as a form of religious expression, developing as techniques improved so that finally little else but aesthetic pleasure for the artist and the observer was the aim of the work (Boas 1955; Cooke 1969:3; 72-73). This apparent compromise between the two schools of thought seems also to have been reached by Brentjes (1969). He realized that in Southern Africa, food was plentiful enough to allow the artist time between hunts and leisure to pursue their traditional arts. He notes that the art has a characteristic and unique realism, although it is tied to a two dimensional medium. The subject is portrayed in genuine and realistic perspective (Brentjes 1969:14). In like manner, it is argued that although Palaeolithic man was culturally primitive, he lived in game-rich environments. With so much abundance of game and vegetable food, economic activities necessary for sustenance were not so difficult as to preclude leisure; the latter was the nourisher of the arts. Hunting activities did not take all their time, and they could well afford to decorate their weapons and wear ornaments (Ucko and Rosenfeld 1967:117). Human beings have an inherent wish to explain themselves artistically, and Palaeolithic parietal art may well have been the expression of this wish to decorate their surroundings. Thus some people have described Palaeolithic art as "exclusively artistic" and the artist as seeking perfection in art and eternally concerned with the cult of beauty (Ucko and Rosenfeld 1967:118).

Besides the aesthetics of rock art, paintings and engravings may have been executed to depict some important events such as battles, successful hunts, raids, the coming of a migrant people into the scene, or even a domestic event such as abduction (Fig. 70a). The well known rock pictures on the banks of the Nile are perhaps some of the best examples of commemorative art. Amongst many others, there are polychrome reliefs depicting the king as a victor over Hittites, Syrians, Libyans and Nubians. In many places from Sudan to Syria, there are comparable decorations celebrating the victories of the Pharaohs. These have been created for religious reasons but the creed which they embody is no part of a hunting magic, but a manifestation of the cult of the dead. Egyptian cliff and cave art on the other hand is dominated by scenes of war and pictorial inventories of the goods and chattels which were the private property of landlords, officials and kings. Pictures of the Eastern invaders are found on many cliffs in the broad territory between the Red Sea and the Nile (Brentjes 1969:54).

The two sites of Mapungubwe and Bamandyanalo in northern Transvaal furnish further instances of rock art as record of past events. In these sites there are pictures of early domestication of both sheep and cattle, possibly as early as 1050 ± 65 A.D. This early artistic record of domestication is amplified by historical accounts from other areas. Cattle and sheep may therefore have appeared as early as the first metal workers in South Africa, around 800 A.D. (Seddon and Vinnicombe 1967:112). There have also been reports of pictures depicting the coming of the Bantu (shown with spear, usually taller and painted in black), and the hunting down of 'Bushmen' by the Boers (Rudner and Rudner 1970). In Rhodesia, Cooke (1970:66) has reported drawings which probably represent piled up branches of a shelter for windbreak. Such shelters may have had a stone foundation to anchor them.

Sympathetic Magic vs. Art for Art's Sake

While admitting the possiblity of magical intent in rock art, Lee and Woodhouse (1968), Cooke (1969) and Rudner and Rudner (1970) seem to favour "the art for art's sake" interpretation though with qualification. For example, Cooke (1969:29) accepts sympathetic magic as an explanation for stylization of the human figures, but rejects its application to the more naturalistic representations. As Vinnicombe (1972) has noted, this is in accordance with the fear that realistic representations of human beings would give the artist power over human life and to permit this would be detrimental to the tribe. By applying the concept of sympathetic magic to the more realistic human beings, Cooke (1969) claims that the human figures must represent immigrants rather than indigenes, but that the animals were executed for pleasure. He argues, it was mainly an endeavour by the artist to record scenes and events, but more often a scene of beauty for its aesthetic qualities (Vinnicombe 1972:127).

Vinnicombe (1972) further argues that although animals appear to be better drawn than men, the difference is not as great as proponents of the sympathetic magic view would have us believe. We are better acquainted with men and notice any lack of proportion more quickly. The difference in the quality of the finished piece of art may not be so great but we still have to explain it. Perhaps the artists did not see the human being as a subject with any aesthetic qualities, and being around the artist all the time it was portrayed with less care. Alternatively the explanation may be found in the sympathetic magic argument.

Capitan, Breuil and Peyrony maintained that tectiforms in European Palaeolithic art represent primitive huts, but ethnographic parallels seem to offer a very different interpretation of tectiforms as traps. The latter interpretation was favoured by the supporters of sympathetic magic who saw the traps as destined to secure the animals for food or to be used against evil spirits. Breuil, however saw the tectiforms as the residences of ancestral spirits and the painted caves as religious sanctuaries (Ucko and Rosenfeld 1967:133). Still Breuil and others also maintained that Palaeolithic men must have been true artists and obviously enjoyed their work. The point to note here is that even within the same notion of sympathetic magic, there can be different interpretations.

In recent works, certain consistent interpretive and methodological assumptions can be isolated from the 'classic' works. All have stressed predominance of animals over humans, and division of animals into food and dangerous species. Like in other areas of prehistory, emphasis is presently on searching and examining cases of practices of modern primitive people and by analogy inferring possible explanations of prehistoric art. Laming and Leroi-Gourham (1967) have refused to accept the use of ethnographic parallels. Instead, they have undertaken their work on Palaeolithic parietal art by detailed recording and compilation of the art itself. Both insist that proper interpretation can only be based on the results of such scientific inquiry. They maintain that only categories and consistencies revealed by accurate records of association of animals in as many cases as possible can be taken as reliable clues to the meaning of art. On the basis of this approach, ethnographic parallels are simply irrelevant to the interpretation of Palaeolithic art (Ucko and Rosenfeld

1967:140).

In conclusion, it should be pointed out that prehistoric rock art is the result of a very complex system of beliefs and practices. As such proper interpretation cannot be achieved without an understanding of the other aspects which together constituted the whole cultural system. Unlike other aspects of prehistory, the study of rock art is more complex for here we have to deal not with objects themselves but with pictures of objects and sometimes with representation of totally intangible realities (Anati 1961:22). Conceptually, there are two kinds of pictures; those which are purely descriptive and those which have symbolic significance. The former generally representing an action being carried out, do not often seem to have a meaning beyond the scenes of which they are a part. The latter are usually static subjects with abstract meanings and carry a symbolic value in the particular scene. This possible duality in the meaning of rock art necessitates the employment of more than one technique in studying rock art. Ethnographic parallels when used judiciously may aid interpretation but the base of any intepretive work should derive from analyses of the context and content of the art itself (Ucko and Rosenfeld 1967:146; Anati 1961:36-40). Sympathetic magic as an interpretive theory is now less fervently invoked to explain rock art scenes, but this is not a denial of magical intent, especially when there is ethnographical evidence in form of legends, folklore and myths.

Possible Interpretations of the Rock Art of Central Tanzania

1. Magico-Religious

Although there are hardly any legends, folklore or myths among the people inhabiting the regions rich in rock art that would directly support the theory of sympathetic magic per se, there is evidence that some of the paintings have more ~~to~~ it than the visual imagery meaning. Rock paintings sites are often located in difficult to reach shelters and deep caves, some of which are still held as sanctuaries by the present inhabitants. In many rock shelters, the paintings appear high above the height of the average person and more than likely, some sort of scaffolding must have been used. The question normally asked is why should the artist have taken so much trouble unless the painting was considered a very important aspect of the socio-religious life of the people.

Caves for sacrifices and ritual are numerous, particularly in the Iramba and Isanzu areas of Singida. The Wanyiramba people still venerate rock paintings. They occasionally sacrifice at many deep caves, some of which contain rock paintings and/or wooden drums. The latter were used in rain-making ceremonies. Culwick has mentioned that the Wanyiramba chip off pices of paintings to use as charms (Fosbrooke 1950: 20; Odner:172,176). However, when the present writer tried to check the authenticity of Culwick's report with some Wanyiramba elders, no confirming answers were found. It should be pointed out that not all caves held as sanctuaries contained rock paintings or drums in them. At Manyoni and Bahi, the author visited several caves which had been reported by the elders as special places for seclusion and sacrifice, but besides modern pottery, lower grinding stones and recent fireplaces, features attesting to their use as sacrificial places, neither rock paintings nor drums were seen. Some of these caves may have been used for seclusion and initiation as mentioned by Fosbrooke (1950:20), while in some places such caves are considered as the abode of clan spirits. It should be noted that while it is true that some rock painting sites were sanctuaries and probably still are, it is misleading to think it is the presence of rock paintings which makes such sites sacrificial places. Rather the paintings meant to have ritualistic or magical significance were executed in such caves because the latter were already considered sanctuaries.

In Usandawe (Kondoa) for example, sacrificial sites are owned by the members of the clans whose sites they are. They are believed to be the abode of clan spirits and as such should be approached with care. No sounds, other than prayers should be made, no trees or grass may be cut, no animals herded, no game hunted and no ground cultivated by the sites, lest the spirits should be disturbed. However, for the purposes of studying rock paintings, the sacrificial sites are of little interest (ten Raa 1974:9), because there is not much represented.

On examining the subject matter commonly represented in the rock art of Kondoa and Singida, it immediately becomes obvious that naturalistic representations of game animals make up an overwhelming proportion (about 70%) of all the subject matter. Apart from a few instances in the late white style, representations of domestic animals are almost absent. Similarly there is a paucity of carnivora, though the occasional feline appears as at Tlawi and hyena at Tura and Ikhanoda (Fig. 79). The dominant motif are the types of animals commonly used for food in African hunting/gathering societies. Some of the animals are depicted having fallen in traps as the two elephants at Fenga Hill (Fig. 90) having been shot at as the hunter and buck at Bubu River, or running away from pursuing hunters as at Nyonyela and Iambi (Fig.91) or even fallen down or having been killed as at Mulyalya and Kwa Mwango. In terms of scenic association, quite a few of the schematized human figures are depicted carrying bows and arrows, shooting at animals or wearing animal head or reed masks, presumably forms of a hunter's disguise. Other forms of human depiction symbolize ceremonial activities, e.g. dancing as depicted by headdresses and other types of adornments, abduction as at Kolo Cave B.1. and various other activities too vague to interpret (Fig, 92). This is partly in agreement with Fosbrooke's (1950:12) observation that the objects and means of the hunt are among some of the dominant motifs followed by the human figure adorned with the paraphernalia probably suggestive of magic and ritual.

Fosbrooke (1950:12) has argued that the naturalistic representations of the animals that would be hunted for food were used in the performance of sympathetic magic. For the same reason, as proponents of the theory of sympathetic magic

Fig. 90 Elephants, humans and other figures from Fenga Hill D, Kondoa. The scene depicted here has been referred to as "The Trapped Elephants" by Fosbrooke (1950). All executed in red.

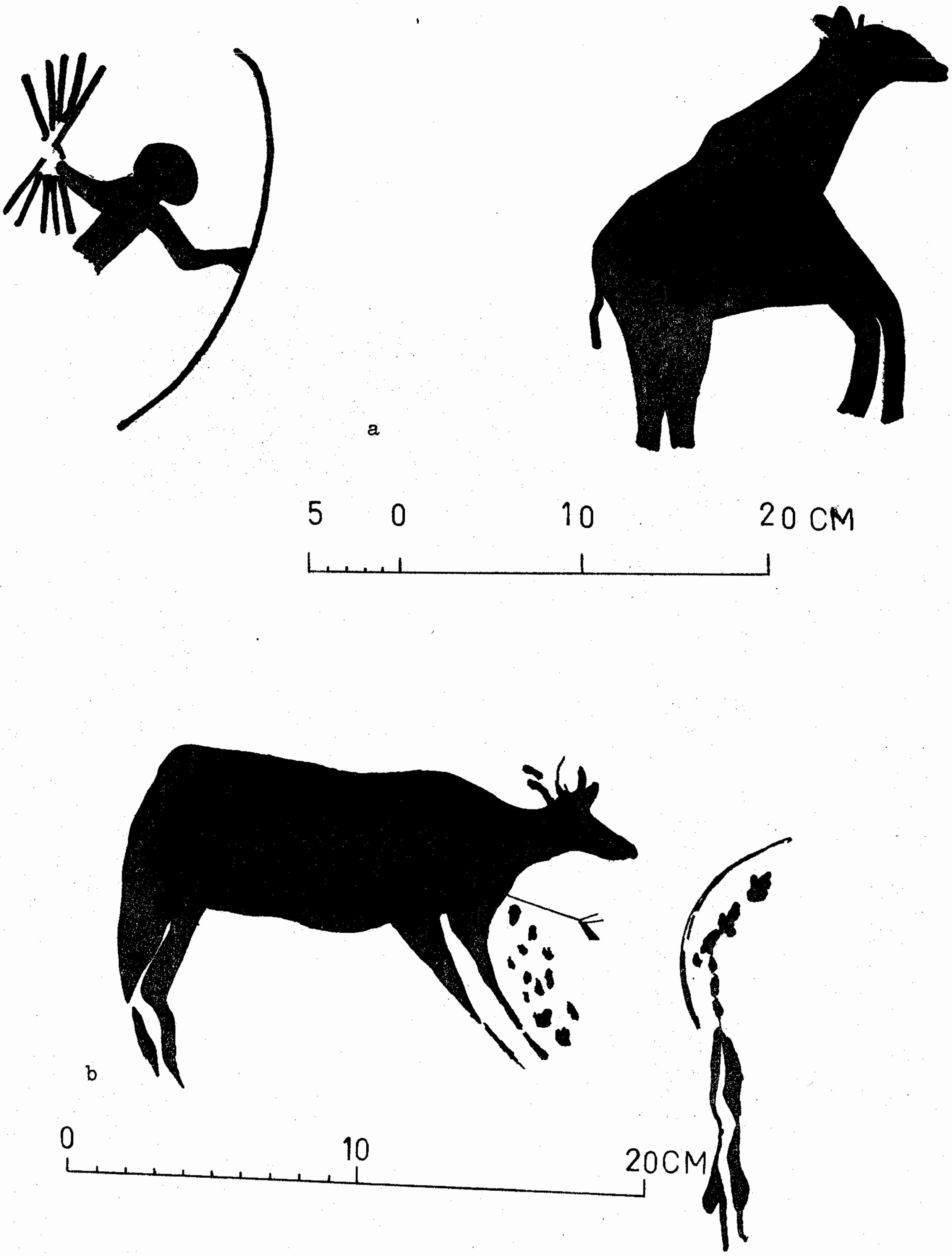

Fig. 91 Hunting scenes; a) man with bow and arrows tracking an animal from Nyonyela, Isanzu and b) animal bleeding after having been shot by the hunter from Bubu River, Kondoa. All executed in red.

Fig. 92 Stylized human figures depicting some activities, probably dancing, from Masange rock shelter, Kondoa. Executed in red.

maintain, the contemporary human figures were executed in the magical inefficacious schematized style to avoid any evil befalling the people. While the theory is itself attractive, supportive evidence is lacking. Indeed as Lewis-Williams has pointed out in South Africa, if sympathetic magic were the predominant motive behind the artists, most of the human figures would not be portrayed and several of the animals would be shown dead and wounded. This is also not the case in the Tanzania rock paintings. He further contends that the pictorial bestiary was not related to the diet of the Bushmen who subsisted on smaller animals (Lewis -Williams 1972:61). However, the latter argument cannot exactly be extended to Tanzania, for it is known from present ethnographies that the animals commonly pictured in Tanzania rock shelters and caves are the most likely to be hunted. The Hadza (Watindiga) who are among the people inhabiting the region of central Tanzania rich in rock art, frequently hunt large animals such as impala, zebra, eland and giraffe (Woodburn 1968:51). On interviewing a few Hadza hunters about their hunting rituals, the writer was told that the only magic used was some sort of a charm which the hunter carried with him whenever he went hunting. Apparently, the charm had the effect of making the hunter invisible until the prey was close enough for him to shoot. They were reluctant to show or divulge the constituents of the charm and denied knowledge of sympathetic magic. The Hadza and Wasandawe are the only remaining people in East Africa whose languages have several clicks, comparable to those of the Hottentots and Bushmen of South Africa. In a subsequent section, it will be argued that more than any other people, the Wasandawe and Hadza are the oldest living indigenes of Tanzania and as such the most likely authors of the early rock paintings in central Tanzania.

Sympathetic magic as an explanation of the central Tanzania rock paintings is also weakened by the fact that representations of animals such as hyenas, monkeys, crocodiles, tortoises, and snakes which were unlikely sources of food are also depicted.

In spite of lack of supporting evidence for sympathetic magic, there is as has already been pointed out, a certain aura of magic associated with some of the paintings. In Iramba, the practice of plastering cow dung on the rock gongs and some of rock paintings is still prevalent, while stomach contents are still ritually used at sacrificial sites during rites. Use of dung for ritual has been reported from the Bantu speaking Wambugwe who used to sprinkle sheep's stomach contents on people during purification cermonies (Odner 1971:172). Rock paintings executed in cow dung have been reported from Mwanza (Soper and Golden 1969:52), Seronera (Bower 1973) and from Lukenya in Kenya (Gramly, per. comm.). Other ritualistic paintings have been reported from the Lake Victoria basin, but the art tradition there is different from that of central Tanzania (Chaplin 1974).

The most documented reference of sacrificial use of rock art sites comes from Usandawe (Kondoa) where ten Raa (1974) maintains that most of the art in such sites is magical rather than casual. He distinguishes magical art from other rock art, apparently on the basis of frequency and quality of art, a distinction I find rather vague. Thus he states:

> ...hunting magic appears to be very prominent in the category of magical art, but that mere casual art is comparatively rare and may be largely limited to inferior drawings and scribbles. And, perhaps most importantly in some cases, sacrificial art can also be clearly distinguished from other rock art, and that the making of such art fulfills exactly the same function as does the ritual aspersion of rocks and gravestones with blood and chyme on some occasions among the present day Sandawe... (ten Raaa 1974:9).

There is however nothing in the sacrificial sites to suggest use of sympathetic magic. Rather the rationale behind sacrificial painting is to provide clan spirits with a visible reminder that they have been duly honoured by a sacrifice so that there should be no longer any reason to interfere with the well-being of the living (ten Raa 1974:11). While the Wasandawe have many legends and folklore which substantiate the practice of sacrificial and magic art, the perpetuation of which engenders appeasement of the clan spirits, there is no evidence that hunting was facilitated through parietal art. Parietal art was used as a form of sacrifice to clan spirits and not to mime or hurt the animals of which the pictures represent. ten Raa's (1974:26) classification of Sandawe rock painting sites into sacrificial sites, hunter's sites and casual art sites is backed up by ample and living folklore. Since the rock art region of central Tanzania is a geographically continuous region, the same three site-type model may probably be a useful one in interpreting the rock art of central Tanzania, but with the data at our disposal it is probably safe to say magical art had different uses for different ethnic groups in the rock painting areas of central Tanzania.

2. Record of Events; Mnemonic

It is contended here that some of the naturalistic animal paintings and the schematized human figures may have been executed by prehistoric man as a record of faunal diversity and to commemorate events of social significance. In the absence of writing, prehistoric man has used pictures as memory aids. Thus he recorded objects, concepts, legends and record of time. The Kondoa and Singida painters would for instance, need to record a successful hunt as the dead animal and rejoicing figure at Mulyalya; puberty rites and betrothal ceremonies as the dancing figure at Mungumi wa Kolo and the woman "kidnapping" at Fenga Hill (Figs.69,70); tribal raids as the painting reported by Fosbrooke (1950:12-13) from Sonjo where representations of some Masai shields had been painted on a rock in the village of Samunge in celebration of the repulse of a Masai raid in the pre-European era; and later after the introduction of domestic animals, such events as cattle theft, herding, and the coming of aliens. Some of the squares, dots and lines may be a form of tallies perhaps of the number of game killed in one given period. The Indians of Dakota for instance, had winter counts as a system of chronology recorded on a buffalo hide. Each year or winter was indicated by a drawing symbolizing some outstanding event such as the outbreak of small pox, or the death of a chief (Grant 1957:35).

Alternatively the masked stylized human figures may represent wizards, spirits or even hunts. In South Africa, the Bushmen when hunting, tried to outwit the animals by imitating the gait of an ostrich and by hiding in an animal skin. There is therefore the possibility that some of the animal headed figures may depict hunters in disguise. They could also depict figures masked for some kind of ceremony or could well be mythical (Rudner and Rudner 1970:208).

The naturalistic animal friezes in many sites when taken in the whole syntax with the schematized human figures, especially when there is a visual suggestion of hunting in the form of arrows, bows, bleeding animal or dead animal would seem to fall under ten Raa's (1974) second category of rock painting sites, i.e. hunters' sites.

3. Art for Art's Sake

Some authors, for example Lajoux (1963), Grant (1967) Frobenius (1931), and Breuil (1955), maintain that all prehistoric art is "magico religious" because the primitive prehistoric populations were incapable of any other form of art. This assertion cannot be entertained too seriously for attribute and stylistic analysis of pottery, lithics and rock art show that even within one cultural tradition there was room for individual artistic aptitudes which produced artifacts, valued not so much because of their practical function but because they represented the products of excellent workmanship, articles of beauty and aesthetic. The different naturalistic styles in the rock paintings of central Tanzania some of which are contemporary with each other, are probably a reflection of different artists' artistic aptitudes and their personal interpretation of the subject matter. Both the schematized human figures and the naturalistic frescoes were painted by artists gifted with a rich imagination who made pictures for the simple pleasure of reproducing what they had seen (Wilman 1968; L'hote 1958; Cox 1970).

In central Tanzania, game was plentiful then as it still is in the protected areas of Tanzania (Chapter 1), and the land abounded with wild fruits and roots which together assured a constant supply of food and therefore made it unnecessary for the Late Stone Age/Iron Age hunter/gatherers to spend all their time to look for food. The Hadza who inhabit an environment similar to that in which the rock paintings are found, and whose food resources must have depleted with the coming of agriculture, spend only a small part of their time looking for food, while the rest is taken up by leisure. It is therefore conceivable that the prehistoric rock artists had some leisure which they spent in various ways. The few who were talented started painting friezes of animals and figurative motifs for the mere joy of seeing a design take form, the realization of an art of creation for enjoyment or the purpose of recording an event. The representations were serious attempts at graphic art, i.e. "art for art's sake". It was merely a pleasure for the artist to picture the animals he saw in the veld - not only those he hunted - as well as the people around him, and thus to decorate his shelter (Rudner and Rudner 1970:210). For similar reasons, people in central Tanzania today engrave figures and motifs on pipes, walking sticks and household paraphernalia.

It is sometimes argued that the highly restricted subject matter and the linking of the representations, by superpositionings are not very conducive to aesthetics but the superpositionings may perhaps represent attempts by less talented artists to copy the work of the better artists. As for the subject matter, it is not as restrictive as we may think because there are several motifs which the modern observer finds difficult to identify. Of course some of the rock art was perhaps done simply to while away an idle hour while some of the more crude representations may have been done by children in trying to copy the work of their elders. The best examples of aesthetic rock art are found in South Africa where the prehistoric artists experimented not only with combinations of different colours (polychrome) but also in portraying animals in different perspectives while attempts of landscaping have been reported from Rhodesia.

4. Others

The study and interpretation of prehistoric iconography tends to give even more tenuous satisfaction when the pictures are geometrics and emigmatic tectiforms totally unfamiliar to the observer. The meaning of such designs as the squares, lines, rows, dots, circles and concentrics, etc., (Figs. 84-89) found together with the naturalistic and schematized pictures in central Tanzania is not really known. Perhaps as has been suggested in South African rock art, some of the geometrics such as grid patterns represent pictures of game nets or traps while the rows of dots and lines may be tallies of how many animals had been killed by one particular clan, but all this is conjecture (Rudner and Rudner 1970:171).

Some authors have suggested that the circle with radiating lines motif is a sun symbol but again there is no reliable evidence for this (Collinson 1970, Chaplin 1974). Hand and finger prints are not only found in central Tanzania, but similar designs appear in Europe, North America, Australia, Sahara and South Africa. In East and South Africa, they belong to the latest phase of the rock art and may probably be the artist's way of endorsing or signing his work after completion. Alternatively they may have been a result of playing around the shelter with paint or may have mythical significance.

Finally there are a plethora of weird signs and symbols as at the sites of Pahi and Kandaga A9 which for all purposes defy intepretation (Figs.84,85). They present such an intriguing problem that we can only speculate that some of them were intended to communicate some important information to the people. In a society where hunting and gathering were the chief economic pursuits, it is conceivable that different bands would create specific signs and symbols to indicate, for instance, where the nearest source of water was, direction and movement of game, presence of hostile band in the vicinity, or direction and movement of the band in the case of changing camp sites. Such signs and symbols would have to be band or tribe-specific so that competing bands and tribes would not be able to decipher them. However, in the absence of interpretive legends and myths to aid the prehistorian, these remain but speculations. Conceivably, some of the enigmatic designs constitute a form of prehistoric abstract or imaginative art.

Conclusion

The different styles, subject matter and motifs commonly found in the rock art of Tanzania is a record of the artistic expressions of different Late Stone Age/Iron Age cultures. Like the conclusion reached by Ucko and Rosenfeld (1967) about Palaeolithic cave art in Europe, the central Tanzania rock art is simply the result of many interests. In any one case, some of the pictures could be the work of children, others associated with some form of magic, some placed in the caves in order to please the people (art for art's sake) and some illustrating particular myths and tradition of the people. It is also certain that some pictures were made for reasons which have not been known to the modern observer (Rudner and Rudner 1970: 21; Lajoux 1963:37-40).

Dating

We are usually tempted to ask how old the Kondoa and Singida paintings are. The answer is we do not really know. Estimates varying from thousands to hundreds of years have been advanced by Leakey (1936; 1950), Fosbrooke (1950), Collinson (1970), Inskeep (1962), and Odner (1971), but these are just rough estimates which have neither been proved nor disproved.

The subject of dating rock art is a difficult one. Various techniques ranging from dating by association of subject matter represented, associated datable archaeological deposits, and stylistic sequences, to sophisticated geophysical and biochemical methods have been developed. The last two have not yet been tried in the rock art of Tanzania but all others have been tried without much success.

Where known species of extinct animals or traceable distinct episodes such as the comming of immigrants are depicted, a fairly reasonable relative date can be inferred by association. In South Africa for instance, only the late paintings and a few petroglyphs can be dated by their subjects as these show Bantu, Europeans, cattle, horses, sheep, etc., the time of whose first entry to the area is roughly known. In Europe, the rock art has been dated by the animals represented, to between 40,000-10,000 B.P. Unlike Africa, Europe underwent extreme climatic changes during the retreat of the Ice Age which considerably affected the faunal life during the last 50,000 years (Brentjes 1969:45). There are no extinct species represented in the rock art of Tanzania, for as was pointed out in Chapter 1, the climate and vegetational pattern have remained more or less the same since the last 15,000 years, and so has the faunal life. Nor are there any traceable events depicted, although we can say that there are very good chances that the "late dirty whites" in which a few domestic animals such as the cattle, the sheep and the dog are depicted, are post Bantu. The Sahara, and to a lesser extent South Africa, are perhaps the only parts of Africa where the rock art can be relatively dated by an analysis of the subject matter (Gualco 1974:45).

Stylistic sequences and superpositioning have been used with a fair amount of success in South Africa (Willcox 1963, Rudner and Rudner 1970), and Rhodesia (Cooke 1969), but this technique has not always proved useful. For sometime, the problem of superpositioning has been a crux in the study of rock art. Breuil (1952) maintained that the paintings of one representation were merely indicative of the passage of time.

On the other hand, Vinnicombe (1967) found superpositionings inconsistent and concluded that superpositionings are only roughly contemporaneous within the area surveyed and she does argue for a development of various painting styles and techniques in succession over a lengthy period (Lewis Williams 1972:57-58). Leroi-Gourham (1968) is also of the opinion that in many instances, the paintings of the second representation upon the first,was deliberate and a means of associating the two without necessarily indicating time lapse. For magico-religious reasons two paintings of one or different subjects might be superimposed over each other by the same artist. Willcox (1963:63) has also warned against the great range of artistic variability in trying to discern chronology from styles. Artistic accomplishment in any one period of time may range from the crudest to the most complete and realistic. Perhaps this variability may be due to the work of different artists. Thus in central Tanzania, the stylized human figures and the different kinds of naturalistic animals may have been the work of several artists working at the same time.

In the Tassili, Gualco (1974:45) has warned against trying to establish a chronology of paintings in terms of styles because a change in style does not necessarily correspond to an ethnic or generation change. Furthermore, the systematic juxtaposition of the figures in several layers makes chronological ordering very difficult because it is not always possible to establish that order with certainty. All in all, superpositioning is difficult to verify because one needs to do a detailed examination with powerful lenses and microscopic inspection (Maynard 1974:15).

When a stylistic analysis of the rock paintings of Tanzania is attempted, it is found, as has already been pointed out, that there is no consistent sequential order. Masao (in press) observed an almost reversal order between two sites, one in Kondoa and the other in Singida. Leakey's (1936; 1950) detailed sequence of styles based on a few shelters from Kondoa, has also been found inapplicable in many sites in Kondoa and Singida (Odner 1974; Fozzard 1959; Masao 1976). It can however be safely admitted that styles 1 and 2 as proposed in this study came before all others, but as to when exactly, is not known. Similarly, the "same technique hypothesis" implying that work employing the same technique belonged to the same period irrespective of geographical location (Brentjes 1969: 45) is, apart from suggesting that the rock art of Kondoa and Singida are contemporary, equally ineffective as a means of developing chronology. It only tells us what we already know, i.e., the late "dirty white" technique and the "red clean paint" technique belong to two different periods. Classification by colour has not proved very useful to the study of distribution or relative age, since the same colours were used in different areas at the same or different times.

Dating rock art by association with datable archaeological occurrences has perhaps more promising results than any of the above. However, in the absence of mobiliary art, such attempts have not been very successful. It has been suggested that some of the south and central African rock art should be dated about 5758 B.C. ± 150 years based on two C14 dates obtained for the Wilton industries at Matjes River shelter which also happens to have rock art (Willcox 1963:30). Willcox (1963) and Clark (1958) have also shown that at Solwezi cave and Chifubwa stream, Zambia, painted engravings are found in a level which is associated with Nachikufu 1 industry and related to the Wilton, dated to about 8000 B.C. to A.D. 1600. The rock art may therefore fall within these time limits. In central Tanzania, Inskeep (1962) and Odner (1971) have excavated two rock art bearing shelters, while the present writer dug the floors of four shelters also with rock art in the same area. In all cases, the archaeological assemblages were of the types that have been lumped together as "Wilton", or better still, Late Stone Age, but capped by Iron Age deposits and with a time range of 19,000 to 200 years B.P. Leakey (1936), Inskeep (1962) and the present writer also found red ochre "pencils" throughout the stratigraphical sequence. These were rubbed and believed to have formed the base of the red pigment in which most of the rock art is executed. If it is therefore assumed that the artists belonged to the people responsible for the Late Stone Age and Iron Age deposits at the sites, then the art could have been done any time between 19,000 and 200 years B.P. (see also Chaplin 1974:46). Three of the sites excavated by the author have given nine C14 dates ranging from 3600 to 200 years B.P.

(Chapter 4). Two rubbing stones (Fig. 47) covered with red pigment were found associated with the archaeological deposits at Kwa Mwango and Kirumi. At Kwa Mwango the rubbing stone was found within level 2 at a depth of 20 cm. There is no C14 date directly associated with level 2, but a charcoal sample from the top of level 1 has given a date of 200 years B.P. While another from the burial at the bottom of level 4 has given a C14 date of 3270±110 years B.P. As was argued in Chapter 2, the second sample, most likely came from level 2 as there was no charcoal either in level 3 or 4, and was subsequently redeposited during the digging of the grave. On the basis of this, the rubbing stone tinted with red pigment may be assumed to be contemporary with the charcoal and the artifacts from level 2. While this is probably a very reasonable assumption, the writer has not been able to prove whether the pigment on the rubbing stone is the same as the pigment in which the rock art at Kwa Mwango is executed. A tuft of hair from the burial was smeared with ochre, but as it was argued in Chapter 2, the burial is later than the deposits in level 2. In view of this, the pigment found with hair is later than the pigment on the rubbing stone, and therefore we can rule out the possibility that the rubbing stone was used to grind the paint associated with the burial. On the basis of this information alone, could some of the rock art at Kwa Mwango be as old as 3000 years? This is hard to say but it is possible.

The second rubbing stone also with pigment was found in trench I, level 5 at Kirumi for which a C14 date of 3665±140 years B.P., based on charcoal was obtained. Again there was no way of testing whether the pigment on the grinding stone is the same as that in which the rock art was done. However, the two sites are in the same area, being only about 3 km. apart and the dates obtained for the charcoal associated with the rubbing stones are close enough to suggest contemporaneity of the assemblages, and perhaps of the rock art in the two sites.

A slab of rock (Fig. 93) measuring 1.55 x 1.20 m. with two patches of white paint on one of the flat sides was found lying beside the robbers' pit at Kirumi Isumbirira. The side facing down had a clean face as if it had recently fallen from the overhang, but attempts to fit it on any of the scars failed. At first it was thought that it had been buried underneath and then subsequently removed by the robbers, but the almost fresh face renders this speculation weak. If the slab was not buried and assuming the white paint patches represent left-overs of the paint that was used for the white pictures in the cave (Fig. 83), then at least some of the white paintings are much later than the lithic assemblages found stratified in levels 1-10 and probably contemporary with the Iron Age artifacts found on the surface.

In conclusion, therefore, dating the rock art of central Tanzania by association with datable archaeological deposits, has not yet proved entirely successful. The ochre pencils that

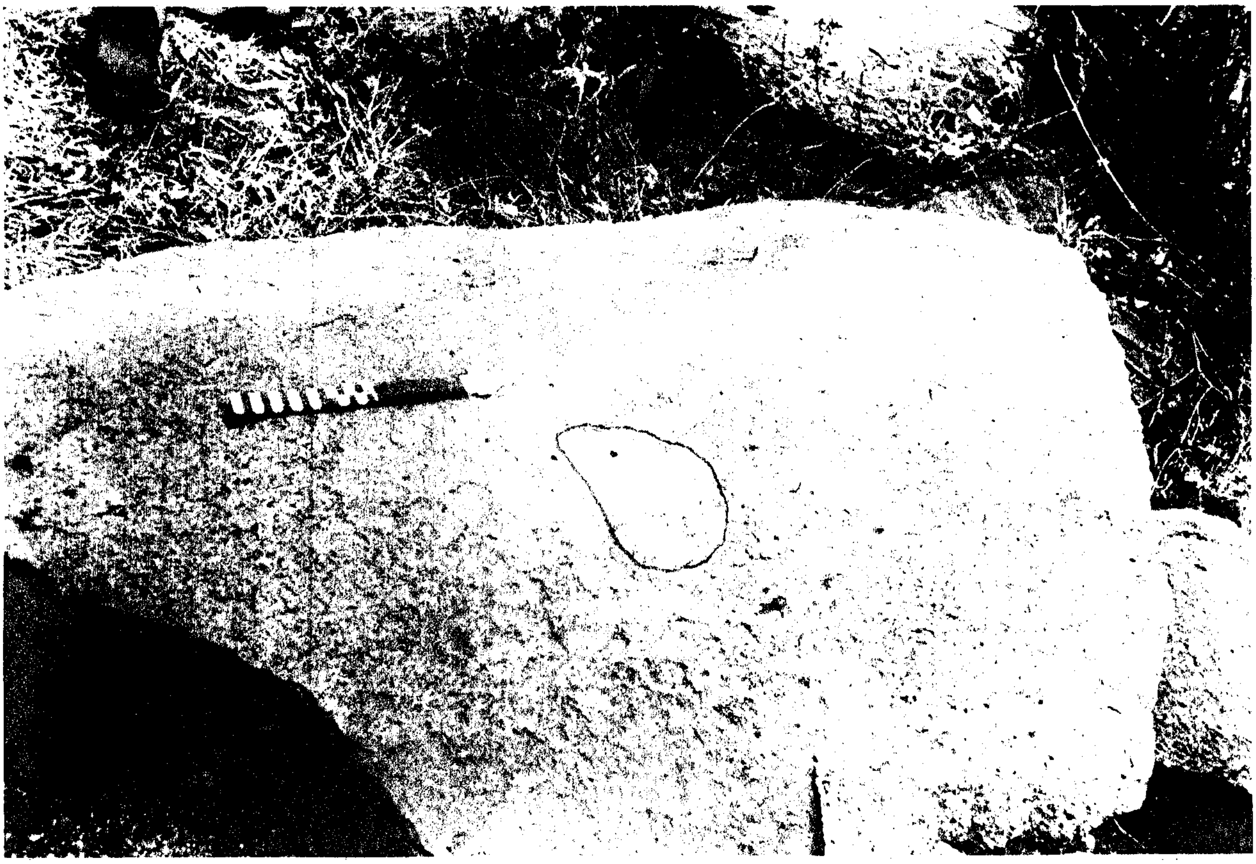

Fig. 93 A huge slab of rock with a patch of white paint, Kirumi Isumbirira, Iramba.

have been referred to and the rubbing stones tinted with pigment,would suggest that the rock art of central Tanzania is at least 3000 years old but some may be as late as 200 years old.

Still another method that has been tried is by taking recourse to ethnography, legends and folklore. Although it is generally accepted that the "dirty whites and yellows" are recent, Odner (1971:176-177) is not convinced that all of them are. He has cited a spear (Fig. 94), used by the Tatog in the "old days" which had decorative motifs broadly similar to some white motifs found in central Tanzania rock painting sites; e.g. at Msule Irimiya (Fig. 95), Ngala rock shelter (Odner 1971) and from Kunguru cave in western Usandawe (Fozzard 1966). He therefore makes a case for broad contemporaneity of the spears and the lizard-like motif found in some shelters. The spears mentioned were manufactured by a group of itinerant smiths and were widely traded in the northern districts of present Tanzania. The lack of more rock art motifs of the late "dirty whites and yellows" comparable to present day decorative motifs on shields, pottery or any other ethnographic artifacts, engenders an element of doubt about the lateness of the "whites and yellows" motifs. However, reports have reached the present writer that some Masai clans occasionally paint the same symbols on rock shelters as they paint on their cattle in cow dung or white to indicate ownership.

Fig. 94 Old Tatog spearhead (after Bauman); Odner (1971).

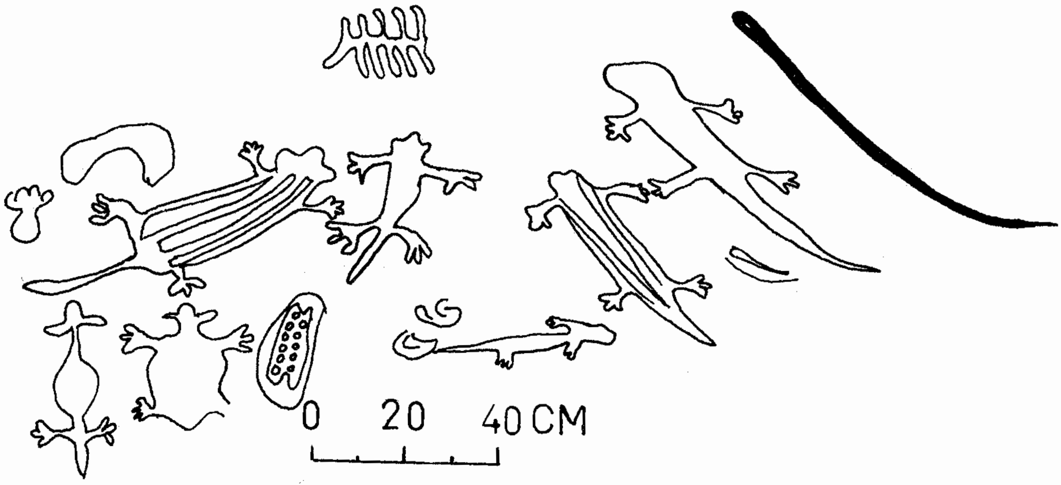

Fig. 95 Paintings of reptiles from Msule Irimiya, Singida.
Executed in white.

Legends and folklore have only proved useful in Usandawe where ten Raa (1969:9-11) has reported that some clans still have a considerable knowledge of the rock art. They claim that some of the paintings were done by their fathers,as even today "a person may write on the rocks while on a hunt and when he is searching for honey." A number of local rock paintings can be directly associated with the ancestors of modern Wasandawe, thereby confirming the oral tradition which holds that the Wasandawe are exceedingly old and established in their present country. This also suggests that some rock paintings are perhaps archaeologically not ancient, although in a historical sense they may be quite old.

As far as it is known, the Wasandawe are the only people whose oral tradition, legends and folklore ,claim authorship of the paintings. The Wagogo who inhabit the area of Dodoma region south of Kondoa district, claim that the paintings were done by the Portuguese while others attribute them to mythical old predecessors known as the Waiyenzere. At Bahi, however, Culwick (1931) and Fosbrooke (1950:14) report that there is a tradition among the local Wagogo that the white paintings were done by the Wamia whom the Wagogo evicted on first arrival in the country. By tracing the genealogies of the local Wagogo, it would appear that they took over from the Wamia some 250 years ago. The Warangi, Wambulu and Waasi of Kondoa and Mbulu districts also attribute the authorship of the paintings to the Portuguese; a myth that is totally unfounded and which shows that there is a general lack of knowledge as to who the people responsible for the rock art were. This tempts one to suggest an age of at least 200-300 years old for the latest paintings, for if they were less old, the present inhabitants (Warangi, Wagogo, Wanyiramba, Waasi, Wanyisanzu, Wambulu) who in most cases have been in their present country for two or three centuries, would have knowledge of them.

Besides the unknown antiquity of the rock art, we are bound to ask another intriguing question, i.e. who were the artists? There is no definite answer to this question, but it is known that before the coming of the Bantu to East Africa, about 2,000 - 3,000 years ago, (in some parts of East Africa, the Bantu came as late as A.D. 1500) part of the country, especially central Tanzania, was inhabited by a bush-manoid stock of hunter/gatherers as evidenced by the Hadza of Iramba district, Singida, and the Wasandawe of Kondoa (Clark 1970:210). The language of the Wasandawe, displays enough morphological and lexical resemblances to the South African Khoisan languages to postulate remote relationship between the two. The Hadza language contains the four clicks as do the central and Khoisan languages of South Africa and has a number of morphological resemblances to Sandawe (Greenberg 1966:72-75), (Fig.96). The life style of the Hadza and until recently that of the Wasandawe, is also comparable to that of the hunter/gatherer Bushmen of South Africa, the latter of which are also accredited with the authorship of most of the South African paintings and petroglyphs. As for the Hadza, it has been reported that some

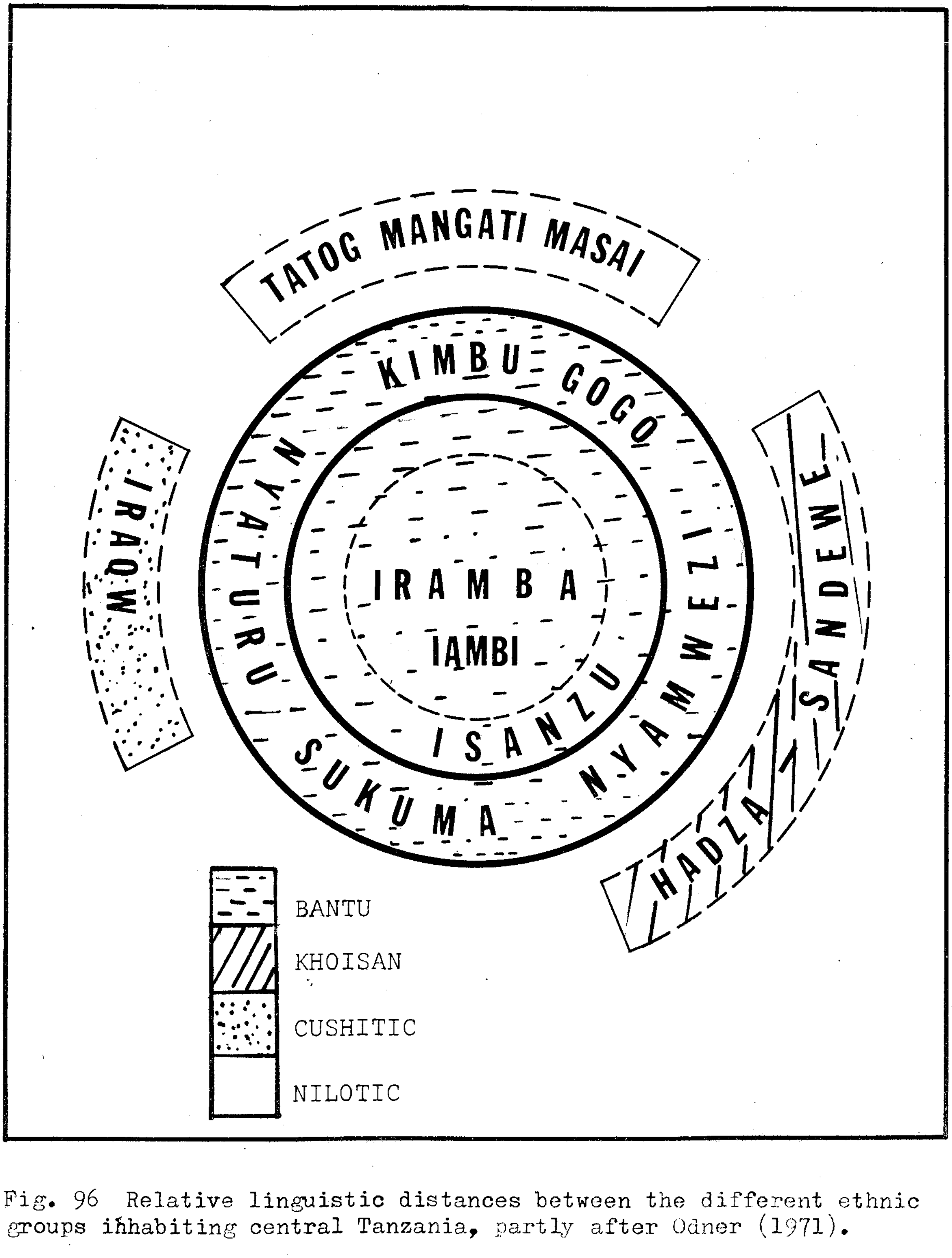

Fig. 96 Relative linguistic distances between the different ethnic groups inhabiting central Tanzania, partly after Odner (1971).

of the women, like the Bushmen women, have steatopygia although their skin colour is negroid dark. Yet, a skull taken from a tomb in northern Tanzania was found to have cranial measurements corresponding closely with those of modern Bushmen (Cole 1963:332-333). Trevor (1947:61-78) has mentioned other physical characteristics about the Wasandawe, such as light skin colour, and sparse peppercorn hair which together with somatoscopic and somatometric tests show that the least distance occurs between the Wasandawe and the Nama Hottentots. The Wasandawe, like some South African Bushmen, also venerate the Mantis. The linguistic evidence which suggests but can never prove kinship, seems to be supported by the physical evidence, but more research is obviously needed in this area.

Nevertheless, it is tempting to surmise whether the two pockets of remnant Bushmanoid people in central Tanzania were not responsible for the rock art. As for the Wasandawe, oral tradition supports this view, but whether or not the Hadza painted on the rock shelters and caves is not known. If the C14 dates quoted earlier can be associated with the paintings, the Bantu would be ruled out as the artists, at least for the earlier paintings. Were the earlier painters pushed out by the incoming iron-working knowledgeable Bantu, or were they assimilated by the latter? Were the earlier painters bushmanoid people related to the Sandawe and the Hadza? The data at our disposal does not warrant an answer to these questions but we may speculate that the early artists were bushmanoid who were later assimilated or pushed out by the Bantu as the case may be. We should note that the rock art of central Tanzania is different from that of Bukoba and Mwanza and any other part of Tanzania, in that almost all other rock art in Tanzania is executed in white and yellow and probably much later than that of central Tanzania. The Kondoa and Singida rock art also displays a number of features that are also found in South African art. The Bantu, more than any other group, would be the most likely people to have painted the so called "late white and yellows" in which, as we have already seen domestic animals such as cattle, sheep and dogs begin to appear. Sutton (1968), also raises the question of early Iron Age sites in the hunter/gatherer territory of Usandawe and suggests that the Bantu with their knowledge of iron working may have tried to live symbiotically alongside the hunter/gatherer Wasandawe.

The geophysical and chemical techniques of dating rock art have not yet been tried in Tanzania. The age of prehistoric art may be estimated by working out the patination rate of the rock and comparing it with its rate of destruction. With this kind of knowledge, it would be possible to determine the age of any petroglyph within narrow limits. The most recent technique however, but one which has not been perfected, is dating by racemization. This technique depends on the presence of amino acids in the sample to be dated. Assuming that there was some organic matter in the pigment used in the rock art, then a sample of the pigment from the art can be used to give an absolute date of the painting. Some paint samples were collected by the author but at the time of writing, it has not been possible to date them.

In conclusion, we might note that, as in Zambia and Rhodesia where there is a general accepted sequence from red to white (Cooke 1969), the same sequence seems to hold in central Tanzania. In all cases, the art is found in rock shelters with "Wilton" or Wilton-like archaeological deposits (Clark 1970: 182) and on the basis of this, Clark's (1958) suggestion that the rock art of Zambia may date back to the fifth millenium B.C., could be extended to central Tanzania rock paintings (Odner 1971:179). Absence of representations of domestic apparatus, iron weapons and architecture may be cited as circumstantial evidence for an early date as argued by Cooke (1969). As was shown in Chapter 3, the lithic assemblages from the four shelters are characterized by a number of microlithic geometrics which, as Clark (1970) has suggested, may have been used as the barbs of a projectile or a knife blade, but may as well have been used as arrow tips and may therefore mark the introduction of the arrow. Sassoon (1967b) has reported paintings of arrows which are apparently tipped with stone crescents, while Cooper (1949:11) has reported that the Hadza used poisoned arrowheads of crescentic shape. Although faunal recovery from the sites was negligible (Chapter 2), the species represented and stratified together with the archaeological deposits, are those that are portrayed on the rock shelter.

Bos species occur only in the upper layers and are stratified together with Iron Age deposits. There is therefore some indirect association of the subject matter represented with the stratified deposits. On the basis of this, C14 dates, the ochre pencils, the rubbing stones, the lack of knowledge about who the painters were among the peoples of Tanzania, and the absence of domestic Iron Age apparatus, this writer ventures that styles one, two and three of the rock paintings of central Tanzania are at least 3,000 years old, while most of the "whites and yellows" motifs, may be as late as 200 years old or even later, as is the case with some Wasandawe paintings. This conclusion resounds that reached by Phillipson (1972a) concerning the rock art of Zambia. He attributes the naturalistic art to Late Stone Age peoples and the non-naturalistic art, which in the case of central Tanzania is predominantly executed in white, to Iron Age peoples. Chaplin (1974:47) also finds this conclusion acceptable for the rock art of Bukoba and Mwanza.

The Rock Art of Central Tanzania In Relation to African Rock Art.

The subject of the origin of the rock art of central Tanzania, like that of African rock art is at present controversial. There are those who would argue that African rock art is not indigenous to Africa but diffused from without through migrations of people, and those who would attribute it to independent development. Willcox (1963:53) for example has argued that the South African rock art has many similarities with European art forms but despite insufficient evidence, he suggests that the former diffused from the latter. He has drawn comparisons between the rock art of Eastern Spain, the Sahara and that of South Africa (Willcox 1963: Fig. 20) and seems to suggest that the three may have had a common origin. In this way, he seems to be following the Abbé Breuil (Breuil 1955:9-12; 1959:6-7; 1966:7-8; 1957:6-7) who constantly suggests that some of the rock art of South Africa was the work of foreigners. Breuil's powerful imagination has led him to see very strong features in the rock art of South Africa which he attributed to Cretan and Egyptian influences. The extreme example of his speculation, which in an unguarded moment of enthusiasm for "an extraordinary" rock painting in South Africa, which he dubbed the "White Lady of Brandberg" and attributed it to "red haired" foreigners, is too well-known to repeat here. Indeed if one is looking for similarities between the rock art of two regions, one will find them; but to postulate diffusion or connection based solely on the similarities, is, it seems to me, stretching the evidence. The non-representational art of central Tanzania, South Africa, or the Sahara can be matched with that of Nevada and Eastern California (Chaplin 1974:40). Does this then mean that the prehistoric rock art of Africa is connected with that of North American Indians? Prehistoric rock art all over has strong elements of universality, an element which makes studies of rock art and its interpretation difficult and fantasy tempting.

The writer does not feel qualified to speculate on the reasons of the presumed similarities between the South African art and that of Spain, but the phenomena may be explained by the fact that in both cases,it was the work of people who were more or less in an equivalent level of technology, both working on rock with similar material and presumably for similar purposes. In either case ,the economic pursuits and life mainstay, involved hunting and gathering and as such the subject matter portrayed reflected the life style of the people. Thus, in the naturalistic art, animal motifs predominated. Even if the bow and arrow are proved to have come from the north as Willcox (1963:52) suggests, this will not necessarily prove that the South African rock art came from the north. Both the rock art of South Africa and the Sahara are associated with more or less comparable lithic industries, but the apparent similarity in the graphic arts and lithic technology is an end product of a more or less same state of cultural development. It seems to me, the three criteria for connection, i.e. uniqueness of trait, absence of local antecedents and absence of functional causality, between the two arts, as proposed by Meggers (1964:572) are not satisfied in this case. No traits can be isolated as being unique to the rock art of these two regions and as has been pointed out before, the artists were in an equally rich environment which easily provided the subject matter. Finally in both cases the artists were motivated by more or less similar purposes, whether these were magico-religious or painting for the mere pleasure of seeing a design take shape.

Contrary to the diffusion theory and the presumed similarities between Saharan, South European and South African rock art, it has been pointed out that neither are Saharan nor South European human figures steatopygic or ithyphallic. No resembling art has been found between Tanzania and Sahara that would lend support to the diffusionists' stand. The Ethiopian art has been shown to have similarities with South African art, but its similarities with Saharan art are greater. For example, paintings of humpless cattle similar to the Tassili type, which occur from the Atlas right across the Sahara to the Horn, occur in Ethiopia (Cooke 1969; Graziosi 1964). One of the features which distinguishes the Ethiopian paintings from those of Central and South Africa is the depiction of cattle horns in threadlike manner, but the schematized human figures resemble those found in the Sahara, Tanzania, Central and South Africa (Graziosi 1964:93). In any case Ethiopian rock art is considered too late to serve as a link for diffusion from Sahara to South Africa. There is no linguistic nor physical evidence to support the theory of diffusion.

Rudner (1965), Battis (1949), Van Riet Lowe (1937) and Vinnicombe (1972) have argued that from the evidence of C-14 dates, and the bow and arrow, the art of painting and engraving may have developed in South Africa and that this knowledge diffused northwards rather than southwards (Vinnicombe 1972: 126; Rudner 1965:58-60). The latter has also pointed out that the paintings of South Africa are similar to those of Zambia, Malawi and Tanzania. The geometric motifs, crudely painted animals, a giraffe painting in thin outline with body stripes and horizontal and vertical lines are found throughout and are associated with the Late Stone Age Wilton or its variants. The latter paintings were done by the Bantu in either case (Rudner 1965:59). The problem of the Bantu will be dealt with later.

As Paradisi (1965) and Brentjes (1969) have pointed out, Libyan rock art (and possibly that of adjacent areas) is placed between the sixth and third millenia B.C. Charcoal from six Saharan sites with rock art, give the following C14 dates; 7438±200, 5952±120, 5405±180, 4730±310, 6754±175 years B.P., while rock and cave pictures on the banks of the Nile have been dated to about 3,000 years B.P. (Brentjes 1969:69). On the other hand the dates obtained for South African rock art sites, correspond rather well with those from North Africa. Thus, at Matjes River Shelter, two C14 dates of 5758±150 and 3443 B.C.±2050 were obtained but a C14 date of 11,250±400 years B.P. from the same site has also been obtained. On the Chifubwa Stream rock shelter Zambia, a C14 date of 6,310±250 years B.P. has been obtained. These dates are based on charcoal associated with Late Stone Age deposits, but it is believed that the makers of the Late Stone Age in South Africa were also responsible for the rock art (Willcox 1963:49,51,68). If we are to assume that the dates given for the North and

South African sites are proper indicators of the antiquity of the rock art, then the rock art in the opposite ends of the continent is more or less contemporary and to infer diffusion from one to another would be to ignore all the evidence to the contrary. It seems that what we have here is one or all of the two kinds of parallelism which Meggers (1964) talks about; i.e. duplication of constellations of traits among primitive groups living at opposite ends of the continent, and a duplication of elements in the cultural development of areas far removed from each other. The traits are too widely separated to seem the result of diffusion (Meggers 1964:513).

Having established that the art in the two most important regions of prehistoric rock art in Africa developed independently, we can now look at the rock art of Tanzania. Tanzania occupies a geographically important position between the two major rock art areas. To the west, Zaire and adjacent areas are almost blank, while to the north, Kenya has not shown much evidence of rock art. To the northwest is the schematized rock art-rich area of Bukoba, Mwanza and the lacustrine area of Uganda while to the south is Zambia and Malawi both of which are rich in rock art, a continuation of the Rhodesian and South African rock art. Central Tanzania is the only area in Tanzania where the rock art is both representational and schematic. If the two major rock art areas to the south and north are connected, Tanzania would therefore be the major connecting link.

General affinities with the rock art of central and South Africa are readily apparent in the rock art of central Tanzania as Rudner (1965) observed. First, the geographical position of Tanzania would suggest some link between the rock art of central and southern Africa as Tanzania is at the northern extremity of a north south rock art belt. This belt may be assumed to run from the Cape Province through southwest Africa, along the highland spine of Orange Free State, and Transvaal through Rhodesia, Zambia, Malawi and Tanzania (Fig. 97). Not only are there many similarities between the rock paintings of central Tanzania and southern Africa, but as was pointed out earlier, the location of the sites, is in many ways similar; in both cases, east facing shelters seem to have been preferred over other shelters (Lewis Williams 1972:49). In both there are steatopygic and ithyphallic figures usually conventionalized, although they are much less frequent in central Tanzania. The subject matter depicted is more or less similar in either case, but there is much more stylistic variability in the representational art of southern Africa, ranging from simple monochrome silhouettes to complex polychrome fore-shortened and false perspective paintings. Non-representational art occurs in both, sometimes alongside the naturalistic portrayals, but more often after the latter and executed more in white and yellow than in red. Most of the earlier art is executed in red. In addition to the prolific artistic styles in South Africa, it should be mentioned that petroglyph sites are almost as many as rock painting sites, but there are hardly any petroglyphs in Tanzania comparable to those found in southern Africa. In all cases, rock painting sites having cultural deposits, seem to be associated with Late Stone Age microlithic industries of Wilton or Wilton variants.

It would be tempting to attribute the origin of central Tanzania paintings to the rock art of Central and Southern Africa but the evidence at hand is not conclusive. Although Tanzania is the geographical northern extension of the rock art belt running as far south as the Cape, there are a few gaps which are not readily explainable. The southern part of Tanzania being proximal to the rock art of Central Africa, would be expected to have as many sites as central Tanzania. However, apart from a few isolated sites in Masasi (Shorter 1967:49), there are hardly any rock art sites comparable to those in Singida and Kondoa. This is perhaps due to the fact that the physiography of southern Tanzania is slightly different from that of central Tanzania, lacking as many suitable outcrops as central Tanzania (see Chapter 1). Whatever the reason, the issue of connection is further complicated, firstly, by the fact that south Tanzania sites appear to be later than the Kondoa and Singida sites, as the art is composed predominantly of geometric motifs executed in thick white pigments, although there are a few naturalistic animals done in red. Perhaps the southern Tanzania rock art is an extension of the northern and eastern Zambian art for which Phillipson (1972) has described an interesting series of palimpsests of non-naturalistic paintings superimposed on naturalistic paintings of animals, more or less similar to the situation encountered in Kondoa and Singida. Secondly, to the northwest of central Tanzania rock art area, is the lacustrine area where like in southern Tanzania, the art is predominantly schematic and executed mostly in white, and later than the naturalistic art of Kondoa and Singida. In spite of the apparent differences, Chaplin (1974:44-45) is of the opinion that the lacustrine area rock art is a part of the Central/Southern African non-naturalistic art area.

The distribution of rock art in East, Central and South Africa has been cited to infer movement of people in prehistoric and historic times. It has been pointed out that there is a very high probability that the makers of the Wilton and related industries of the Late Stone Age, were also responsible for the earliest naturalistic rock art. In South Africa, the only Late Stone Age people known to have occupied the country are Bushmen and therefore, more than anybody else, these were the people responsible for the paintings and engravings in South Africa and Rhodesia and possibly some of the rock art in Zambia and Tanzania. Study of the human figures both in rock paintings and engravings which display steatopygia and sometimes steatomeria and the erect penis characteristic only of the Bushmen, lends support to the fact that the Bushmen were the authors of the art (Willcox 1963:67-71). Although such figures are found in the rock paintings of Tanzania, their frequency is negligible and this raises the question whether the rock art of central Tanzania was created by the same people.

One theory maintains that the two forms of rock art as found in South Africa (paintings and engravings) were done by the cave dwelling painters and the kopje dwelling engravers who supposedly migrated separately from the north; the painters going south by east of Lake Victoria through Tanzania, Zambia, Rhodesia and then to South Africa, while the engravers passed to the west of Lake Victoria through Angola, South West Africa and thence to the Republic (Willcox 1963:72). Like Willcox (1963) the present author finds it difficult to entertain this theory to explain the distribution of prehistoric rock art in East, Central and South Africa. There is neither linguistic nor physical evidence to support it, although it was mentioned earlier that the click speakers of central Tanzania may be related to the South and Central African Bushmen. Migrating artists from the north have also been reported by Breuil (1957:6-7) but again there is no evidence to support this speculation. He states thus:

> "The route by which immigrant strains from the north could have reached both Rhodesia and South West Africa is most probably that which leads from the Upper Nile between the great lakes and virgin forest. It is interesting that the tradition of such route survives in the legend of a phantom safari which is current among certain tribes in Kenya and Tanganyika. The story runs that a phantom legion of men passes southward once a year marching through eastern Uganda,

Western Kenya and Tanganyika into Rhodesia returning northwards later in the year. (Breuil 1957:8).

The legend was reported by Van Riet Lowe in 1939 and is said to have been first heard of at Kitgum in northern Uganda, then amongst the Luo and Kakamega tribes in Western Kenya, the Nandi in southwestern Kenya, the Wambulu and Warangi near Kondoa, the Wahehe near Iringa and the Wanyakyusa near Mbeya which is near the Zambian border and on the natural corridor between the great lakes of Tanganyika and Malawi. However, before the immigrants' arrival in Southern Rhodesia and South West Africa, they had been preceded by several earlier phases of artists. The art of the Bushmen preceded, accompanied and followed the art of foreigners. The immigrants are said to be of Nilotic origin (Breuil 1957:9). Again we have no way of evaluating the above legend, nevertheless we may rest assured that if the legend is true, the immigrants were not people of Nilotic origin, as reported by Breuil, but rather Bantu, whom as has been pointed out several times, are responsible for the later rock art in East, Central and South Africa.

The Bantu dispersion nucleus is supposed to have been the area near present day Cameroons. From the nucleus area they moved eastwards to the Nile Valley and there intermingled with a Caucasian people, notably the Hamites of East Africa. From somewhere around the great lake area (Lake Victoria), where the greatest incidence of pure Bantu words is concentrated, one group moved south disrupting the life styles of the indigenous people (? Pigmy and Bushmanoid) and causing them to flee

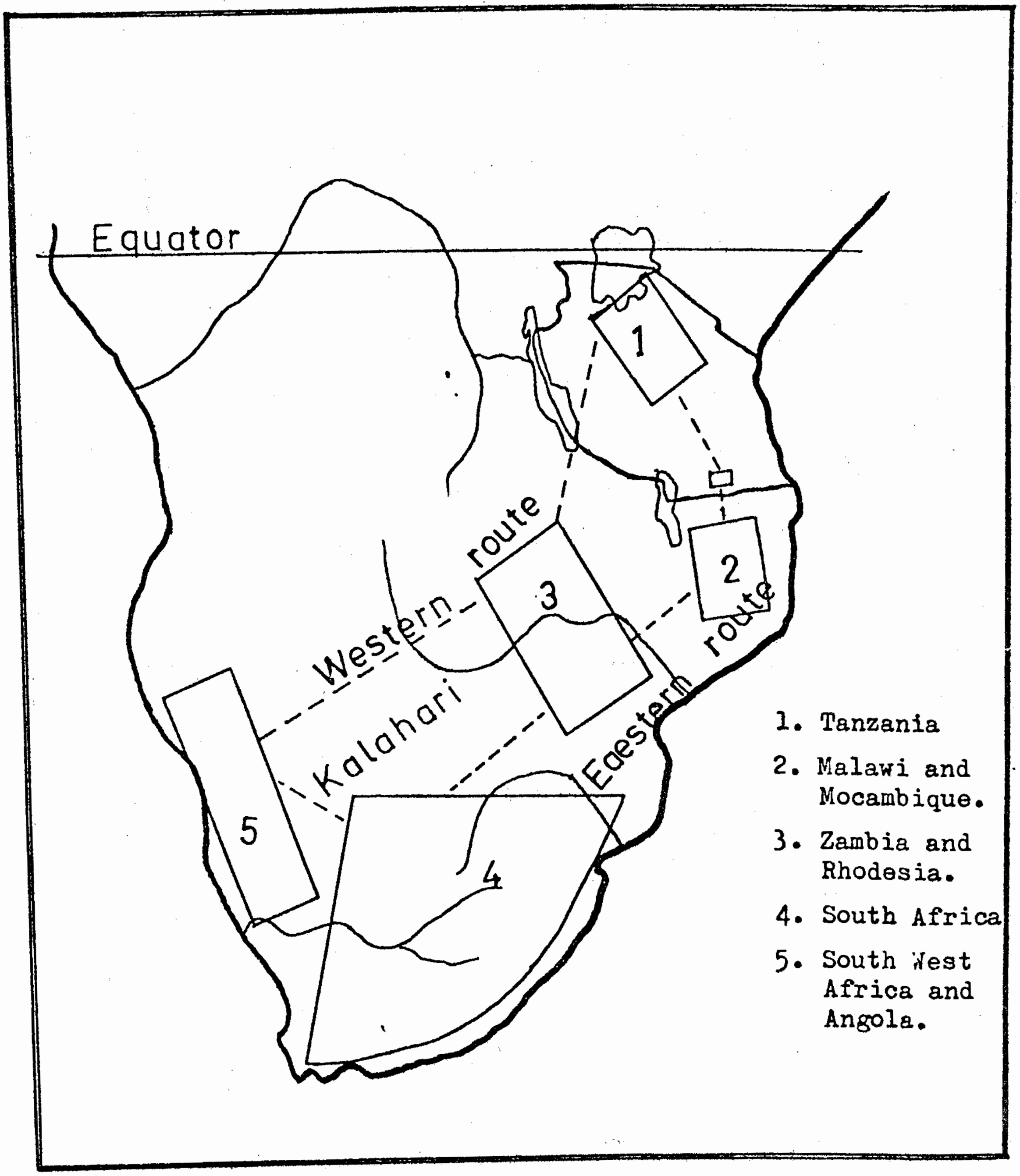

Fig. 97 The rock art areas of East, Central, South and South West Africa showing possible routes of connection. Partly adopted from Rudner and Rudner (1970).

south. To date there are two remnant click speakers in central Tanzania, the Hadza and Wasandawe supposed to be Bushmanoid, and a near extinct group known as the Ndorobo,inhabiting the mountain forests of Kenya and believed to be related to the Pigmies. Until recently, these tribes led a hunting and gathering life unlike the surrounding agricultural Bantu. The Sandawe have recently started supplementing their hunting and gathering with a little agriculture. The southern moving Bantu intermarried with the indigenous tribes but as they expanded they pushed the Bushmanoid further south to central and southern Africa. The Bantu also brought the knowledge of iron working with them. Their arrival into southern Africa is depicted in the rock painting by war scenes showing little people (Bushmen) fighting large people (Hottentots and Bantu). They are also depicted in paintings with iron tools. The Bantu expansion is said to have taken place during the first half of the first millenium A.D. (Turnbull 1962 :12-13).

It seems therefore, if we assume connection between the rock art of South and Central Africa, and that of Tanzania, such connection cannot be explained in terms of movement of the early artists as a response to Bantu expansion pressure. By the time the Bantu had reached Southern Africa the art was already complex and varied. Connection would have to be explained in terms of movement of traits and people from Southern Africa to central Tanzania and the Lake Victoria area. Not only is the southern African art older, but it is more varied in terms of subject matter depicted as well as techniques employed. In view of this, could the older rock art of central Tanzania have been done by the Bushmen before their migration south? Are the monochrome silhouettes in central Tanzania then older than the polychrome and foreshortened paintings in South Africa? There is nothing to suggest that the central Tanzania rock art is older, in fact chances are that overall, the rock art of Tanzania is later and may have come from South and Central Africa.

Summary

To recapitulate, the information presented in this chapter shows that the rock art of central Tanzania is far from being well understood. There seems to be a deliberate preference for east facing shelters none of which seems to have been selected with reference to permanent sources of water. A refined stylistic sequence which would be an indicator of relative chronology is difficult to develop due to the inconsistent order of superpositioning. Four broad stylistic categories have been suggested and it is suspected that styles one, two and three may be contemporary and precede style four. Dating the rock art by association of the subject matter, archaeological deposits and by oral tradition has not been very successful but various indirect evidences would suggest a duration of 3000-200 years B.P., although there are also a few sites which are still being painted either for magico-religious reasons or by children at play. Most of the early styles (1,2 and 3) seem to have been done by people (? Bushmanoid) who inhabited Tanzania before the present-day Bantu groups. Although there are a few legends that suggest that most of the paintings were done for magico-religious purposes, some were probably done for the mere pleasure of painting. There are some common features with the rock art of the Sahara and South/Central Africa, but if there is any direct connection with either, it is with the latter rock art area. Perhaps a statistical analysis which seeks to quantify selected distinguishing features of the rock art may prove more informative, but until this is done, the rock art of central Tanzania remains distinct from that of the Sahara and South/Central Africa.

CHAPTER 6

CONCLUSIONS

The four assemblages constituting the corpus of the present study are, as it has been argued before, in some respects like any other East African terminal Late Stone Age assemblages, displaying a high degree of inter-site and a much less intra-site variability, but they also share some features specific to the Late Stone Age of central Tanzania. Like all Late Stone Age assemblages they are characterized by a microlithic technique with geometric forms, scrapers, *outils écaillés* and retouched waste as the dominant tool types. The origin of the microlithic technology has sometimes been explained in terms of migrations. It has been suggested that towards the end of the Pleistocene, a new people from the north and moving down the east coast of the continent influenced the indigeneous people practicing a macrolithic technology involving the prepared core technique, often associated with the Middle Stone Age. These people are thought to have gone through East Africa, thereafter to Central and Southern Africa and are credited with the introduction of a technology descended from the blade-and-burin cultures and dependent on the production of microlithic bladelets (Miller 1969:; Summers 1957).

For this suggestion to be considered viable the following criteria would have to be satisfied according to Thomson (1959; 64).

1. The migrating people must be identified as an intrusive unit in the region it has penetrated.

2. The unit must be traceable to its homeland.

3. All occurrences of the unit must be contemporaneous.

4. Existence of favourable conditions for the migration must be shown.

5. Must be able to demonstrate that some other hypothesis, such as independent development or diffusion of traits does not better fit the facts of the situation.

The evidence in support of the migration thesis is far from convincing for not only did the proliferation of the microlithic cultures take place in North Africa more or less simultaneously with those in sub-Saharan Africa, but a case can also be made for local parallel development from the Stillbay and the Magosian Middle Stone Age industries which in some sites seem to underly Late Stone Age industries. At Apis rock in northern Tanzania, the Late Stone Age is believed to be a direct derivative of the "Magosian" which it overlies (Leakey 1936), while at Kisese in central Tanzania, a transitional industry, possibly belonging to the 'Second Intermediate Period' seems to give rise to a fully developed microlithic Late Stone Age. The transitional industry has been dated to 18,190±300 B.P. (NPL-37) (Deacon 1966). Equally early dates for a microlithic industry at Occurrence E Lukenya Hill, Kenya, of 17,670±300 and 17,700±760 B.P. have been reported (Gramly 1975). Another early Late Stone Age assemblage is the Nachikufan which at Leopard's Hill has been dated to 16,400±265 and 21,550±950 B.P. (Sampson 1974:356). While these few examples are hardly sufficient, they nevertheless show that the antiquity of the Late Stone Age and the concomitant microlithic technology in sub-Saharan Africa is as great as in North Africa, and may be argued that the sub-Saharan microlithic industries are an independent invention; deriving from antecedent Middle Stone Age or "Second Intermediate" industries, and are possibly part of the same rapid spread of the new technology as also is the case with the North African Sebilian and Silsilian industries.

Nevertheless, it would be presumptuous to maintain that all Late Stone Age microlithic industries evolved from an ancestral "Magosian." Miller (1969:490) has shown that at Leopard's Hill Cave, the "Magosian" is not the only ancestral industry to the microlithic Late Stone Age industries in Zambia. There are at least two other indigeneous industries which gave rise to the Late Stone Age technology and the picture is more complicated than implied here. However until more work is done on both the Middle Stone Age and the Late Stone Age in different parts of sub-Saharan Africa, it will be stretching the evidence to argue that microlithic technology was introduced in East, Central and Southern Africa by people migrating from the north. This does not preclude the spread of ideas from north to south and vice versa, for as Clark (1970:154) has pointed out, where prehistoric hunters and gatherers are concerned, it is not so much large groups of people, but ideas that moved and this cannot be better seen than in the spread of the microlithic technique throughout the African continent after about 15,000 B.C.

It is generally believed that the advent of the microlithic industries in Africa was stimulated by the invention of the bow. Barbless poisoned bone and arrow points have been used in parts of sub-Saharan Africa for the past 4,000 years or longer. The various geometric microliths attest to composite tools, possibly made of hafted microliths; and to the use of projectiles and therefore a hunting activity. While it is conceivable that some of the backed blades and flakes were used for cutting, their small size suggests they were hafted (see also Clark 1974:190-191). Hafted on a projectile they would prove effective in bringing down game. The sharp utilized flakes may alternatively have been used as cutting tools held in the hand. In assemblages where geometric microliths constitute a sizeable component of the tool classes, it can be assumed that whether they were hafted, used as barbs, projectiles, knives or sickles, they were part of a hunting weaponry. The blades may have been coated with plant poison as still practiced by a few hunting/gathering tribes in Africa today. Barbless wooden arrowheads with a connected link shaft have been reported from the Gwisho sites which date to the second and third millenia B.C., and possible use of the poisonous plant Swartzia madagascariensis by the hunter/gatherers of Gwisho has been suggested (Fagan and Van Noten 1971; Gabel 1965;

Miller 1969; Clark 1970; Gramly 1975).

We should not lose sight of the fact that there was much more regional and temporal variability in the Late Stone Age tool kit than has been portrayed hitherto. Temporal variability is seen in terms of changing artifact types and their overall respective proportion of the total assemblage throughout time. This may reflect a technological change as a response to a new invention or adjustments to changes in the environment resource base. Different environments exerted different demands on the Late Stone Age cultures; hence the regional variability which is also reflected in the composition of tool types. It has always been unequivocably assumed that all Late Stone Age people were hunter/gatherers, but the four assemblages from central Tanzania show that the tools which may be assumed to be directly associated with hunting (geometric microliths and backed blades) form only a small part (4-8%) of the tool category. Although the four assemblages do not clearly show any kind of variability which may be explained in terms of adaptation to differing environments and/or specialization to specific activity facies, yet it is known for instance that in the Rift Valley highlands of Kenya and northern Tanzania, the Stone Bowl cultures are distinct from other Late Stone Age cultures in that they specialized in stone bowls, burial cairns and probably practiced agriculture and a form of animal husbandry (Cohen 1970; Bower 1973; Sutton 1970; Nelson 1973). At such sites as Njoro

River Cave, the Late Stone Age cultures practiced cremation and specialized in the manufacture of body adornments such as a variety of beads and pendants (Leakey 1945). Leakey (1936: 69), has also reported a Late Stone Age culture ("Wilton C") along the shores of East African lakes associated with immense shell mounds or escargatoires in which thumbnail scrapers are very rare, while the pottery is coarser and different from that of the "Wilton A" or "B." In the rock shelter sites of central Tanzania, the Late Stone Age seems to have had relatively few formal tools. Perhaps some of these were factory or short period camp sites; nevertheless, rock painting seems to have been an important activity. The variability and specialization in Late Stone Age assemblages generally exceeds that at any time previously, a reflection, perhaps of a more closely integrated social structure and a greater capability to exploit the environment (Clark 1970:174). Contrary to this overview, the implements from the four assemblages studied for this thesis do not imply a wide functional range. Most of them (scrapers, outils écaillés, and retouched waste) were probably connected with scraping, woodworking or several other functions not yet well known. In any case, if hunting was a major activity of the Late Stone Age inhabitants of the four central Tanzania sites, this is neither reflected in the archaeological data nor in the paucity of the faunal remains retrieved from the sites. It would be interesting to find out whether this is a general condition obtaining in "terminal" Late Stone Age sites in East

Africa. The forthcoming detailed study in variability within the East African Late Stone Age, presently being undertaken by Dr. Nelson will hopefully shed some light on the activity patterning of the Late Stone Age. Alternatively, the four rock shelter sites may have been work camps for extractive activities as opposed to base camps for maintenance activities. The latter are more permanent and therefore have a more representative cultural deposits (see Binford and Binford 1966). However, in the absence of comparative data from other types of Late Stone Age sites in Tanzania, no final pronouncements can be made here. Suffice it to say that in the central Tanzania Late Stone Age sites, the stratigraphical distribution of artifacts is intermittent especially in the deeper strata. Occupational activity seems to have increased after 3500 B.P. and remained more or less the same until after contact with Iron Age.

The four assemblages, in traditional typological terms would be regarded as "Wilton-related", but as was argued in Chapter 4 (see also Inskeep 1967; Fagan and Van Noten 1971: 120; Nelson 1973) the term has only vague meaning because of the incomplete information regarding the type assemblages and because of its usage for a wide variety of improperly described industries. They should be referred to as Kwa Mwango industry.

It was pointed out in Chapter 4 that the East African Late Stone Age industrial complex spans a period of about 20,000 years. Throughout this period, there have been ecological changes which must lie behind the multivariant patterns of the earlier Late Stone Age industries. Yet there are broad similarities which permit the regional grouping of the archaeological occurrences of this time period under the rubric of Late Stone Age industries. The similarities are best seen in the form of broadly similar tool types persisting through time and space. At a more specific level of analysis, the Late Stone Age display a high degree of temporal and regional variability, a result of technological changes through time and adaptation to changing environmental conditions. These changes may be attributed to a number of other factors, but it may be assumed that whatever the factors, they were all instrumental in bringing about more efficient ways of exploiting the resources of the environment. Some of the changes may also be due to group differences. Clark (1970:157), has for instance argued that the synchronic minor variations that distinguish, for example, a particular contemporary 'Later Stone Age' Nachikufan assemblage on the Zambian Copperbelt from one using the same raw material in the Muchinga escarpment, some four hundred miles to the northwest, can probably best be seen as the outcome of group preferences. The differences also emphasize the individuality as well, perhaps as the relative isolation of the hunting communities that occupied the sparsely populated Central African savannas at that time.

Overall, there are no basic differences in technique or tool types in the 20,000 years old East African Late Stone Age. The temporal variability seen is in terms of differentially increasing or fluctuating frequencies of some tool types through time, and/or the disappearance or introduction of a new form, but the basic tool types characteristic of the Late Stone Age (geometric microliths, small scrapers, outils ecailles and bipolar technique) are maintained throughout the temporal continuum. Nevertheless, the present writer has suggested four tentative broad chronological stages or phases which may be useful in studying the East African Late Stone Age. The four central Tanzania assemblages studied by the author and the Lulu-lampembele assemblage studied by Odner (1971), fall within one of these phases, i.e. ' "terminal" Late Stone Age', mainly on the basis of their place in the long temporal continuum and on association with Iron Age artifacts and faunal remains of domestic animals. This phase is characterized by the usual Late Stone Age microliths in the lower stratigraphical units, but in many cases there is a mixture of Iron Age artifacts (pottery, slag and iron implements) and Late Stone Age artifacts in the upper layers. This shows that the lithic technology was not immediately discarded away with the advent of a more efficient iron working technology. The evidence from central Tanzania and from other sub-Saharan "terminal" Late Stone Age sites indicates that the two cultures coexisted together for some time and that the phasing out of the lithic technology was gradual rather than sudden. Indeed the Bushmen of South Africa and the Australian Aborigines still use stone knife blades on a small scale (Clark 1968:278).

No wooden implements were recovered from central Tanzania, but these have been reported from the Zambian sites of Gwisho and Kalambo (Gabel 1965, Fagan and Van Noten 1971, Clark 1970), and there is no reason to assume that the Late Stone Age peoples of central Tanzania did not use similar implements.

Putting all the data together, we can conclude that the Late Stone Age people of central Tanzania led a life approximating that of the present day Hadza hunter/gatherers. There is no evidence to suggest that they had permanent base camps, but instead they moved from one rock shelter or cave to another in their nomadic pursuit of game, and on several occasions, the same or a different band[27] may have reoccupied the same rock shelter or cave. Hitherto no open sites, other than the quarry site of Iseke (Chapter 1), have been reported from central Tanzania. If the amount of bone recovered from the sites is an indication of the amount of meat eaten, then meat was not a significant part of the diet when the groups occupied the rock shelters. However, it is known that hunter/gatherers bring back to camp only parts of the animal while the bulk of the meat is partaken of at the butchery site. In view of this, it is more likely that more meat was eaten than the small amount of bone refuse would have us believe.

Other than hunting, they must have collected wild fruit and roots although flotation techniques did not reveal any

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[27] Woodburn (1968:103) refrains from the use of the word "band" in describing the residential groupings of the Hadza because its connotation of leadership, corporateness and fixed membership is inappropriate for the Hadza. He prefers the term "camp" meaning the set of persons who happen to be living together at one place at one time. "Band" is used loosely in the present study.

seeds in the deposits. Perhaps the condition of the soil is not conducive to preserving seeds. They also manufactured tools while other talented with an artistic aptitude decorated the shelters with painted animal motifs, symbols and signs. This pre-supposes a social organization which catered, not only to the immediate economic needs but also for ritual and the fulfillment of aesthetic aspirations. Throughout the deposits, pieces of haematite were recovered. It is likely that these were ground to make the paint with which they decorated the shelters and possibly their bodies. Bodily ornamentation is also attested by the beads found associated with other archaeological deposits.

It may be assumed that there were several bands in central Tanzania and their social system must have had legal strictures to control relationships between the individuals of one society and those of neighbouring groups. If the size of the rock shelters and caves are an indication of band size, then it seems that single bands had between 15-20 individuals at one place at a time; an estimate approximating the average number 18 adults in a Hadza camp (Woodburn 1968:104). Later, the Late Stone Age people seem to have come into contact with the Iron Age people and in a few cases, as for instance at Kandaga A9, acquired iron working knowledge as indicated by slag and tuyere but in others, they remained iron using. Most of the bands became more readily absorbed by the new iron knowledgeable immigrants (?Bantu) and together are ancestral to the present people of central Tanzania, while isolated bands like the Hadza and Wasandawe, resisted the assimilation and chose to continue to practice hunting and gathering as the Hadza would still be doing today had government intervention not settled some of them in villages (see also Silberbauer 1972[28]).

The present study has suggested that some of the rock art in central Tanzania is old enough to have been done by the Late Stone Age hunter-gatherers. However, there is also evidence, especially from Usandawe and Isanzu, that some of the rock art is not only historical but fairly recent. Unfortunately, unlike in South Africa, the subject matter and scenes depicted in the rock art do not lend any clues as to the type of contact between the immigrating Bantu and the indigeneous hunter-gatherers like the Hadza, Wasandawe, Ndorobo, etc. While it is most likely that a period of peaceful symbiosis prevailed, there is no reason to assume that there were no skirmishes or internecine warfare between tribes; since such clashes survived to recent historical times. At any rate, such clashes were perhaps between the different Bantu groups and/or other immigrating groups such as the Nilotes rather than with the indigeneous hunter-gatherers.

[28]Silberbauer (1972) has argued that although the early history of Khoisan and Bantu contacts in southern Africa is obscure, there is evidence to suggest that there was a period of symbiosis during the Iron Age, from about A.D. 900 onwards. This may have led to absorption of local Bushmen by the iron working Bantu in the region of the Magaliesberg mountains in central Transvaal.

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Appendix A: Summary of the subject matter, activities and styles commonly depicted in the rock paintings of Kondoa.

SITE NAME: Kisese A3 and A4 (Facing east)

Subject Matter:

Human: stylized and semi naturalistic (red)

Animals: Naturalistic (giraffe, eland, kudu, rhino? crabs (red)

Others: geometric and various symbols (red and white)

Activities:

Human: hunting, dancing

Animals: running and feeding

Summary of Styles:

1. thin and thick line drawings
2. stylized sharp profile silhouettes
3. open line outline
4. boldly filled-in silhouettes
5. line outline infilled with line shading

SITE NAME: Itololo (Facing east).

Subject Matter:

Human: stylized (red)

Animals: naturalistic but too faint to identify. Various kinds of antelopes and snail-like drawings (red)

Others: geometrics especially semi-circles (red)

Activities:

Too vague to interpret

<u>Summary of Styles</u>:

1. thin and thick line drawings
2. boldly filled-in silhouettes
3. open line outline
4. line outline infilled with line shading

<u>SITE NAME</u>: Kandaga A9 (Facing east)

<u>Subject Matter</u>:

Human: stylized (red)

Animals: naturalistic; eland and other antelopes (red)

Others: geometrics, e.g. lines, squares, circles, ladders etc. handprints and other symbols (white)

<u>Activities</u>:

No apparent scenic relationship

<u>Summary of Styles</u>:

1. thin and thick line drawings
2. line outline, infilled with composite shading

<u>SITE NAME</u>: Masange B13 (Facing east)

<u>Subject Matter</u>:

Human: stylized and naturalistic - some with some sort of attire (red)

Animals: naturalistic; rhino, hyena, kudu and ?cow (red)

<u>Activities</u>:

Human: dancing or some form of ceremony

Animals: feeding

Summary of Styles:

1. thin and thick line drawing (stylized)
2. boldly filled-in silhouettes
3. line outline infilled with line shading
4. open line outline

SITE NAME: Tlawi VIII (D19) (Facing north-east)

Subject Matter:

Human: stylized and semi-naturalistic (red)

Animals: naturalistic, e.g. feline, giraffe, buffalo, wildebeest, buck, rhino, etc. (red)

Activities:

Human: hunting

Animals: walking, feeding

Summary of Styles:

1. thin and thick line drawings (stylized)
2. open line outline
3. line outline infilled with line shading
4. boldly filled-in silhouettes

SITE NAME: Bubu D15 (Facing north)

Subject Matter:

Human: stylized (red)

Animals: naturalistic e.g. giraffe, rhino, buck, antelope, etc. (red)

Activities:

Human: fighting? hunting?

Summary of Styles:

1. thin line drawings (stylized)
2. open line outline
3. line outline infilled with line and dot shading
4. boldly filled-in silhouettes

SITE NAME: Fenga Hill (Facing east)

Subject Matter:

Human: stylized and semi naturalistic (red)

Animals: naturalistic e.g. elephants and various antelopes

Others: tree-like drawings (red)

Activities:

Human: hunting by ?trapping

Summary of Styles:

1. thick line drawings (stylized)
2. boldly filled-in silhouettes
3. line outline infilled with line shading

SITE NAME: Kwa Mtea (Facing east)

Subject Matter:

Human: semi-naturalistic (red)

Animals: naturalistic e.g. giraffe, hyena, and several other animals too faint to identify (red)

Activities:

Human: killing of predators, e.g. hyena drawn upside down

Summary of Styles:

1. boldly filled-in silhouettes
2. open line outline
3. outline infilled with line shading
4. non outline, line and dot shading

SITE NAME: Cheke 3 (Facing east)

Subject Matter:

Human: stylized (red)

Animals: naturalistic, e.g. giraffe, eland, kongoni ?crabs, etc. (red)

Others: tree-like drawings, geometrics, e.g. geometrics and lines and various symbols (red and white)

Activities:

Human: hunting

Summary of Styles:

1. thick and thin line drawings (stylized)
2. boldly filled-in silhouettes
3. outline infilled with dots and line shading
4. non-outline variously shaded

SITE NAME: Majilili 2B (Facing west)

Subject Matter:

Human: stylized (red)

Animals: naturalistic e.g. giraffes, ?donkey (ass) etc. (red)

Activities:

Human: dancing

Summary of Styles:

1. thick and thin line drawings (stylized)
2. boldly filled-in silhouettes
3. outline infilled with various line shading
4. open line outline

SITE NAME: Mungumi (Facing west)

Subject Matter:

Human: stylized and semi naturalistic (red)

Animals: naturalistic, e.g. giraffe, elephant, eland buffalo etc. (red)

Others: geometrics and tectiforms e.g. lines, circles and various symbols. Tree-like drawings (red)

Activities:

Human: abduction, dancing, hunting

Summary of Styles:

1. thick and thin line drawings (stylized)
2. open line outline
3. boldly filled-in silhouettes
4. non outline dot and line shading

SITE NAME: Pahi B4-13 (Facing north)

Subject Matter:

Human: stylized and semi naturalistic with loin cloth (red)

Animals: naturalistic e.g. giraffe, eland, rhino, zebra, snake, millipede, etc. (red and white)

Others: geometrics, e.g. lines and crosses, tectiforms and various symbols (white)

Activities:

No apparent scenic association

Summary of Styles:

1. thick line drawings
2. open line outline
3. boldly filled-in silhouettes

Appendix B: Summary of the subject matter, activities and styles commonly depicted in the rock paintings of Singida.

SITE NAME: Mjakhuda (Facing east)

Subject Matter:

Human: stylized and naturalistic; the latter depicting some clothing (red)

Animals: naturalistic e.g. giraffe, antelope ?cow, etc. (red)

Activities:

Human: dancing, hunting ?herding

Summary of Styles:

1. thick line drawings (stylized)
2. single and double open line outline
3. outline infilled with line shading
4. boldly filled in silhouettes

SITE NAME: Ngimu (Facing east)

Human: stylized and naturalistic (red)

Animals: naturalistic e.g. giraffe, eland, zebra, ?cow, etc. (red)

Others: geometrics, e.g. lines and circles and various other symbols (red)

Activities:

Human: hunting, ?herding

Summary of Styles:

1. thick and thin line drawings (stylized)

2. open line outline

3. boldly filled silhouettes

SITE NAME: Taru (Facing south)

Subject Matter:

Human: stylized (red)

Animals: naturalistic e.g. giraffe, elephant, kudu, porcupine, etc. (red)

Others: various sorts of symbols

Activities:

Human: dancing, hunting

Summary of Styles:

1. thin line drawings (stylized)
2. open line outline
3. boldly filled-in silhouettes

SITE NAME: Mulyalya (Facing west)

Subject Matter:

Human: stylized (red)

Animals: naturalistic e.g. giraffe, eland and various antelopes (red)

Others: geometrics e.g. circles, concentrics, "sun symbols" and other symbols (red)

Activities:

Human: fleeing

Summary of Styles:

1. thick and thin line drawings (stylized)

2. open line outline

3. boldly filled-in silhouettes

SITE NAME: Mguguno (Facing west)

Subject Matter:

Human: crudely naturalistic (white)

Animals: crudely naturalistic, e.g. giraffe, hyena, ostrich, buffalo, hare, wildbeest, baboons, reptiles, etc. (white)

Others: geometrics e.g. parallel and radiating lines, and other symbols

Activities:

Human: no apparent scenic relationship

Summary of Styles:

1. bold filled in crude naturalistic silhouettes

SITE NAME: Ngongoamau (Facing east)

Subject Matter:

Animals: naturalistic and crudely naturalistic e.g. giraffe, rhino, zebra and various other antelopes (red, black and white)

Others: geometrics, e.g. lines, circles, squares and other symbols

Activities:

No apparent scenic relationship

Summary of Styles

1. boldly filled-in silhouettes
2. boldly filled-in semi realistic silhouettes

SITE NAME: Msule Irimiya (Facing west)

Subject Matter:

Animals: naturalistic, e.g. various kinds of reptiles; tortoises, lizards, crocodiles, snakes, etc. (white)

Others: geometrics e.g. circles, crescents and semi-circles (white)

Activities:

No apparent scenic relationship

Summary of Styles:

1. boldly filled-in silhouettes
2. outline infilled with dot shading

SITE NAME: Mtula (Facing west)

Subject Matter:

Others: geometrics, e.g. lines, U's, crosses, circles, squares, gridirons, etc. (red, white, orange and brown)

Activities:

Others: ?doodling

Summary of Styles:

1. thick line drawings - (geometrics and symbols)

SITE NAME: Kwa Mwango (Facing west)

Subject Matter:

Human: stylized (red) depicted with arrows

Animals: naturalistic e.g. giraffe and various antelopes (mostly red but few in white)

Activities:

Human: hunting

Animals: feeding

Summary of Styles:

1. thick and thin line drawings (stylized and geometrics)
2. boldly filled-in silhouettes

SITE NAME: Nyonyela (Facing west)

Subject Matter:

Human: stylized (red) depicted with bow and arrows

Animals: naturalistic e.g. eland (red)

Activities:

Human: hunting

Animals: fleeing

Summary of Styles:

1. line drawings
2. boldly filled-in silhouettes

SITE NAME: Isanzu Mission

Subject Matter:

Animals: naturalistic, e.g. big rodent-like animals, ?ant eaters (red)

Others: symbols e.g. headdress-like picture of feathers or reeds (red)

Activities:

No apparent scenic relationship

Summary of Styles:

1. open line outline
2. boldly filled in

SITE NAME: Kirumi Isumbirira (Facing east)

Subject Matter:

Human: semi-naturalistic and slightly stylized (white)

Animals: crudely naturalistic, e.g. giraffe, hyenas and other unidentifiable animals (white

Others: geometrics, e.g. circles, squares, ladders and other symbols including handprints (white)

Activities:

No apparent scenic relationship

Summary of Styles:

1. boldly filled-in semi-naturalistic silhouettes

Appendix C: Summary of the Rock Art of Singida and Kondoa

Subject Matter: Human Figures

Pigments Commonly Used:

1. various shades of red, especially for the earlier stylized line drawings
2. various shades of white, especially for the later crude naturalistic drawings

Prevalent Styles:

1. thick and thin line drawings; mostly stylized with variable exaggerations for anatomical parts; e.g. head and buttocks, occasionally with face masks, headdresses or pigtails
2. thick line shadings especially for trunk, limbs, and musculature, sometimes disproportionately elongate
3. boldly filled-in crude naturalistic in white but more naturalistic in red, in the latter figures may be clad

Subject Matter: Animals; by far the most common subject matter

Pigments Commonly Used:

1. various shades of red
2. various shades of white
3. black, orange, brown: naturalistic representations of animals executed in these pigments are also found but they are rare

Prevalent Styles:

1. simple line drawings; very rare
2. boldly filled-in maturalistic silhouettes, the most common style of representing animals
3. open line outline, mostly single but sometimes double
4. outline variously shaded

Subject Matter: Trees (rare)

Pigments Commonly Used:

1. black
2. shades of red

Prevalent Styles:

1. line drawings

Subject Matter: Geometrics: lines, squares, circles, concentrics, grid patterns, ladders, etc.

Pigments Commonly Used:

1. mostly in various shades of white and red
2. occasionally in orange and brown

Prevalent Styles:

1. thick and thin lines

Subject Matter: Tectiforms: i.e. symbols and other unidentifiable (mythical) representations

Pigments Commonly Used:

1. mostly in various shades of white and rarely in any other pigment.

Prevalent Styles:

1. thick lines

2. non outline dot and line shading

Appendix D:

I. Rock painting sites recorded in Singida Region

The list includes sites previously recorded and described by Kohl Larsen (1936) Chittick (1958) and Odner (1971). The site names are those used by the local inhabitants at the time of survey but where different names have been used for the same site, they are given in brackets. To facilitate relocation of the site where it was not possible to work out the geographical coordinates, the name of the smallest political division (Tarafa) or the district is also given alonside the site name.

Suka Mahela - Manyoni District on Mnyamare Mt.

Hanje (Mwao) - 5° 10' 43" S, 34° 50' 50" E, Singida District, Ikungi division

Taru 1 - 5° 10' 30" S, 35° 00' 12" E, Ikungi division

Taru 2 - — — — "

N'gongoamau Ntutu - 5° 05' 15" S, 35° 00' E, Singida District, Munghaa division

Msule Irimiya - 5° 05' 30" S, 35° 00' 30" E, Singida District, Munghaa division

Ngimu 1 (N'gongoangimu) - 4° 45' 4" S, 35° 05' 6" E, Singida District, Mgori division

Ngimu 2 - Singida District, Mgori division

Sanga Mwandifu - 4° 45' 38" S, 34° 45' 30" E, Singida District, Singida division

Mitati Ilisia - Singida District, Sepuka division

Mwayati - 4° 4' 10" S, 34° 50' 12" E, Singida District, Ilongero division

Mwamuringa - 4° 40' 8" S, 34° 50' 20" E, Singida District, Ilongero division

Mipilo Merya - Singida District, Ilongero division

Ighange - Singida District, Ughange division

Mwamitera - Singida District, Ilongero division

Ikhanoda - 4° 35' 3" S, 35° 55' 22" E, Singida District Ilongera division

Mjakhuda - 4° 30' 50" S, 34° 55' 5" E, Singida District, Ilonera division

Lululampembele - 4° 02' 40" S, 34° 23' 20" E, Iramba District

Kitulu - 4° 17' 50" S, 34° 28' 20" E, Iramba District

Kisana - 4° 15' 10" S, 34° 27' 05" E, Iramba District

Ngala - 4° 10' 20" S, 34° 27' 05" E, Iramba District

Manga Rock - 4° 08' 55" S, 34° 09' 20" E, Iramba District

Kinakumi - Iramba District, Kiomboi division

Mkalama - Iramba District, Mkalama division

Nyonyela - Iramba District, Kirumi division

Ilungurampepo - Iramba District, Kirumi division

Kirumi Isumbirira - 4° 6' 00" S, 34° 43' 00" E (approx) Iramba District, Kirumi division

Munyeti - Iramba District, Kirumi division

Kwa Mwango - 4° 6' 00" S, 34° 45' 00" (approx) Iramba District, Kirumi division

Kinyingogo - Iramba District, Kirumi division

Mguguno (Mukukunu) Iramba District, Kirumi division

Mtula - Iramba District, Kirumi division

Isanzu Mission - Iramba District, Kirumi division

Mukirambiri Isanzu - Iramba District, Kirumi division

Kinto Isanzu - Iramba District, Kirumi division

Mulyalya Iambi - Iramba District, Nduguti division

Ikunda Iambi - Iramba District, Nduguti division

II. Rock painting sites studied in Kondoa District, Dodoma Region.

The following list of sites are amongst those previously recorded and described by Fosbrooke (1950). They were revisited during the survey with the view to studying stylistic sequences. No attempt was made to work out geographical coordinates since the sites are already well known to the public.

Kisese A3 - Kondoa District, Masange division

Kisese A4 - Kondoa District, Masange division

Kisese A10 - Kondoa District, Masange division

Kwa Mtea - Kondoa District, Masange division

Itololo - Kondoa District, Masange division

Kandaga A9 - Kondoa District, Masange division

Masange A9 - Kondoa District, Masange division

Masange A13 - Kondoa District, Masange division

Cheke 2 - Kondoa District, Masange division

Cheke 3 - Kondoa District, Masange division

Pahi - Kondoa District, Pahi division

Mchulunchulu - Kondoa District, Kolo division

Mungumi B1 - Kondoa District, Kolo division

Majilili B2 - Kondoa District, Kolo division

Majilili B3 - Kondoa District, Kolo division

Mageani F2 - Kondoa District, Kwa Mtoro division

Tongosora (Fenga Hill) - Kondoa District, Kwa Mtoro division

Kinyasi B15 - Kondoa District, Kinyasi division

Kinyasi B16 - Kondoa District, Kinyas division

Kinyasi B17 - Kondoa District, Kinyasi division

Kinyasi B18 - Kondoa District, Kinyasi division

Kinyasi B19 - Kondoa District, Kinyasi division

Tlawi Hill III - Kondoa District, Swera division

Tlawi Hill IV - Kondoa District, Swera division

Tlawi Hill V - Kondoa District, Swera division

Bahi - Dododoma District, Bahi division

Mpamantwa - Dododoma District, Bahi division

Chungai 1, A18 - Dondoa District, Masange division

Chungai 2 A21 - Kondoa District, Masange division

Masange A14 - Kondoa District, Masange division

THE NATIONAL MUSEUM OF TANZANIA

P.O. BOX 511 - DAR ES SALAAM

ARCHAEOLOGICAL SURVEY FORM

1. Site Name..
2. Site No..
3. Site References..
4. Map...
5. Region...
6. District.....................Division/Tarafa.................................
7. Extension of the site..
8. Archaeological deposits...

   ....
9. Rock Paintings..

   ....

   ....
10. Description of the site:

    (a) General Description..

    ....

    ....

    (b) in relation to bio-environments (faunal and floral life, primary or secondary vegetation)

    ....

    ....

    ....

    (c) in relation to geographical environments (rivers, lakes, valleys, hills, mountains, outcrop rocks, plains etc.)

    ....

    ....

    (d) in relation to other sites in the vicinity...............................

    ....

    (e) in relation to known ethnography (present inhabitants and their knowledge of the area)

    ....

    ....
11. Photograph Nos...
12. Reference to publications if any...
13. Condition of site (poor, rich, disturbed etc)...........................

    ....

continued--

continued--

Archaeological Survey Form

14. Accessibility..
....

15. Recorded by......................Date.............................

16. Record any other information you feel might be relevant

....

....

....

17. Attempt a rough sketch at back of form.

FOR ROCK SHELTERS WITH PAINTINGS

1. Name of Shelter (local name)...

2. District.....................Division..

3. Number of paintings on shelter...

   ....any superposition detected?.........................

   ....

4. Description of the Paintings. Whether Naturalistic (realistic), Schematic, or geometrical..

   ....

   (b) Whether in motion or motionless..

   ....

   (c) Technique - whether silhouettes, pure outline, outline filled-in, biochrome and/or monochrome

   ....

   ....

   ....

   (d) Subjects represented - animal (specify) humans, others, mythical

   ....

   ....

   ....

5. Photograph Nos...

   ....

6. Recorded by..........................on..................................