Felix Chami

THE TANZANIAN COAST IN THE FIRST MILLENNIUM AD

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The Tanzanian Coast in the First Millennium AD
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An archaeology of the iron-working, farming communities

by

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With microscopic analyses by

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ABSTRACT

This thesis deals with the cultural processes which took place on the coast of East Africa in the first millennium AD. The work focuses on the cultural origin of the Triangular Incised Ware (TIW) tradition, its temporal change and spread over the whole coast of East Africa.

The study, based on excavations at six sites, indicates that the central coast was the area of genesis in the 4th-5th centuries AD of this late, widespread tradition. TIW derived from the Early Iron-Working (EIW) communities that originated in the interlacustrine region of East Africa around the 5th century BC.

The florescence of the tradition coincided with evidence of an increased population, improved metal technology and the introduction of foreign trade. Consideration has also been given to the spread of this tradition to the islands, the littoral and the deep hinterland. Similar cultural backgrounds and inter-regional trade could have facilitated the fast spread that took place in the 7th-9th centuries AD. The continuity of this tradition was interrupted by the Islamic-Swahili tradition at the beginning of the 10th century AD.

Key words: coast of East Africa, first millennium AD, early iron-working, farming, Triangular Incised Ware, Sassanian-Islamic, trade.

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This book is an archaeological work reviewing the extant knowledge of the ancient, East African, coastal communities and providing new data that contribute to such knowledge.

In time, the work focuses on the first millennium AD. This is important, because, apart from controversial, early documents and the early occupation of the urban settlements dated to the 9th-10th centuries AD by the use of relative dating, the pre-9th-century coast remained terra incognita. As a corollary to this, the relevant scholarship was afflicted by speculations concerning the nature and the origin of the people inhabiting the first-millennium, coastal settlements, their way of life and their cultural configuration.

In space, the work generally focuses on the whole coast of East Africa. The case studies are on the sites that flourished on the littoral and in the hinterland of the central coast of Tanzania. In most of the literature, both the central and the southern coasts of East Africa have been portrayed as recipients of immigrants and ideas from the Middle East and the northern Kenya coast. The immigrants attracted by trade and Islamic in religion were thought to have founded the early urban settlements later to be identified with the Swahili.

Empirical, positivistic and coherence strategies have been used to test various hypotheses pertaining to the origin, spread and cultural affiliations of the ancient coastal communities. These encompass the understanding of the environment, the economic potentialities and the analysis of various archaeological finds, for example, Triangular Incised Ware (TIW) and carbon-14 samples from sites excavated on the littoral and in the hinterland.

Two phases have been identified for the first millennium coastal settlements. The first is the Early TIW phase, also identified as pre-8th-century or Azanian or pre-Islamic. The beginning of this phase was probably in the 4th century but it might have gradually developed from the EIW communities of the early centuries AD. The diagnostic materials of the period include TIW pottery with many Early-Iron-Working (EIW) pottery elements, early alkaline products, for example, glazed pottery, glass and beads.

The second is the Later TIW phase, also identified as Zanjian or proto-Islamic. This probably started at the beginning of the 8th century and ended in the 10th-11th centuries AD. The diagnostic materials of the period, apart from typical TIW pottery, are Islamic products, i.e. white, tin-glazed wares and early sgraffito.

The TIW tradition seems to have had its origin in the earlier EIW tradition, contrary to the existing Arabic/Persian or Cushitic theory. Archaeologically observed changes in their cultural norms can be perceived as a normal process of internal adjustment for various reasons, for example, growing population, new contacts and trade opportunities. These would lead to re-organization and the adoption of new ideologies.

The TIW tradition seems to have been widely distributed all over the littoral and deep in the hinterland. This can be explained by the fact that the people were farmers and metal-smelters with close, cultural links between the littoral and the northern Kenya coast. The immigrants attracted by trade and Islamic in religion were thought to have founded the early urban settlements later to be identified with the Swahili.

It is also suggested that the change of trade agents from Persians to Islamic Arabs might have destroyed many East African communities, especially those in the hinterland. Many TIW settlements ended abruptly, both on the littoral and in the hinterland. This was probably due to a dramatic shift in trade alliances, new trade directions and probably a demand for new trade goods, i.e. slaves. A new, littoral class of Islamic converts and merchants would have engineered war, which is a necessary means to obtain slaves. Consequently, the Later TIW settlements flourished mainly on the littoral and the islands, becoming prosperous, as may be seen from the construction of monumental architecture, and apparently Islamic. This was the beginning of the littoral–hinterland dichotomy on the coast of East Africa.
1. INTRODUCTION

There has been a great need amongst the scholars of the East African coast for information about the culture of the coast in the first millennium AD and even earlier. To cater for such a need, abundant literature has been produced since the beginning of this century.

The present contribution is based on recent research in a previously unexplored area. It is an exposé of data from seven sites in the Kisarawe and Bagamoyo Districts of Tanzania, linked to data from other first-millennium sites reported from other parts of the coast. Sites with similar cultural materials have been found on the coast of East Africa in the area from southern Somalia down to southern Mozambique.

In this chapter, I intend to define a few concepts used in this thesis. I shall then discuss the focus and the background of the work.

1.1 Conceptual definition

The coast of East Africa. The belt that makes up the coast of East Africa is described in Chapter 5 and is shown in Map 4. It is the land along the Indian Ocean, extending from southern Somalia to southern Tanzania and covering the islands of Pemba, Unguja and Mafia. In White's (1983) vegetational map, the strip extends to southern Mozambique, the Comoros and Madagascar. From the shore, the coast can be as wide as 50–200 km into the interior, the widest part being between the port of Tanga and the Rufiji delta in Tanzania, where the coast extends to Morogoro in central Tanzania. In some of the literature (Horton 1984, p. 299; Datoo 1975, p. 3; Sutton 1990, p. 57; Nicholls 1971; Chittick 1975b), the coastal concept means the flat, 10-km strip along the shore. This narrow strip is referred to in this work as the “littoral”, while the land 100 m above sea level beyond is the “hinterland”. On the coast of Tanzania, the hinterland extends beyond 200 km, reaching the fringes of Nguru and the Usambara Mountains (Map 4).

Early Iron-Working (EIW). This concept stands for sites with the earliest evidence of iron-smelting in eastern and southern Africa. On such sites, the presence of slag and tuyères indicates smelting. These finds are associated with potsherds with bevelled and fluted rims and shoulders. It has been shown that such sites were occupied by farmers in the period from the 4th century BC in the interlacustrine region to the 4th century AD in Southern Africa (Phillipson 1985; Soper 1971a; Sinclair 1987). The concept of EIW replaces that of the Early Iron Age (ELA), which has been thought to have been imposed on the African situation, and that of Early Farming, which is now seen to comprise stone- using, food producers (Phillipson 1985, pp. 5, 113–47; Robertshaw 1990, p. 4; Shaw, Sinclair, Andah & Okpoko 1993, p. 3).

Later Iron-Working (LIW). Following the use of EIW, the period formerly defined as the Later Iron Age (LIA) is hereby changed to LIW.

Triangular Incised Ware (TIW). This stands for the pottery tradition that succeeds the EIW tradition along the coast in the first millennium AD. Some EIW pottery elements have been identified in the TIW pottery (see Chapter 8). Over 20% of the decorated potsherds recovered from the TIW sites are incised with triangles and therefore are TIW. Other, frequent, decorative elements are lines of punctuation, zigzagging double incisions and oblique incisions. Previously, the TIW pottery tradition has been known as Kitchen Ware (Chittick 1974) and Tana Ware (Horton 1984, 1987b; Abungu 1989). The change in the concept is aimed at avoiding functional and geographical biases in the former definition.

Tradition. I have used the concept of tradition to mean “the development of a particular assemblage through time” or “the time depth of a type of decoration” (Hall 1983, p. 52).

Phase. This is a specific time segment, in which a minor change occurs in the assemblage or other key material in the tradition (Hall 1983, p. 52)

Culture. This means groups or communities of people represented by an archaeological tradition. It encompasses the lifestyles and idiosyncrasies portrayed by such a tradition. According to Huffman (1980, p. 124),

Style as a part of culture is learned and possessed within groups of people, and the correlation between design style and specific groups is well known (e.g. Boas 1927). Those portions of material culture which vary stylistically can be used to identify groups of people even though the size of the group and their other characteristics are unknown.

The TIW tradition, therefore, stands for a first-millen-
nium-AD, coastal culture present on the coast of eastern Africa between the 4th and the 10th centuries AD. Its cultural material, as indicated by the archaeological data, is discussed in Chapters 6 and 7.

Swahili. This denotes the coastal culture that developed in the littoral settlements, probably from the end of the first millennium AD. The Swahili people are known to have been farmers, fishermen and traders who dwelled in the stone-built towns, some of whom were Muslims (Allen 1980, 1982, 1993).

Early scholarship. This refers to the period c. 1900–1965, when the coastal, historical and cultural studies were made by using ancient and medieval travellers’ reports and the chronicles. The coast of East Africa was regarded as a colony of Arabs or Persians.

Later scholarship. This refers arbitrarily to the period 1965–1980, in which archaeological techniques were introduced to support and clarify the reports and chronicles. Chronology was analysed by studying the pottery imported from the Middle East and China. The coast was still seen as a colony of foreigners.

Recent scholarship. The period from 1980 to the present, in which there has been a shift of emphasis from the colonization framework to Africanization. This is a shift of paradigm from which the coast of East Africa is seen as mainly African. There is much more combination of data from archaeology, linguistics and ethnographic/oral tradition.

1.2 Focus of the research

The work focuses on the first-millennium sites found along the littoral and the deep hinterland of the Tanzanian coast now dated to the 4th–10th centuries AD. Pottery with incisions or punctates bounded by triangles characterises the sites of this period. The pottery has, therefore, been labelled “Triangular Incised Ware” (TIW), as defined in section 1.1.

The present work reassesses the extant theories explaining the nature of the first-millennium, coastal culture in relation to the coastal environment, technology and economic activities. Pottery, which has been used to identify and explain the origin and distribution of different cultural groups in eastern and southern Africa (Phillipson 1976, p. 3; Soper 1971b, c; Huffman 1970), is subjected to further analysis. The extension of this study to associated materials, i.e. metal objects, beads, imported ceramics and glass, is aimed at widening our knowledge of the first-millennium-AD, local and inter-oceanic, exchange networks.

To obtain a chronological perspective of the early coastal developments, archaeological data pre-dating the TIW tradition will be discussed. This study will be supported by twenty C14 results obtained from seven sites in the study areas of Kisarawe and Bagamoyo.

From the case-study area, the work is aimed at spatially extending our horizon to cover the whole coast (Map 1) in the first millennium AD. The East African islands are involved in this work, because many of them have TIW sites with early, imported materials, i.e. Sassanid pottery. On account of the implication of its trade with East Africa, the area around the Gulf and the Arabian peninsula will also feature in the discussion.

In general, the focus is on the first-millennium coast of East Africa, the origin and distribution of its culture and its relationship with the Indian Ocean trade.

1.3 Research background

The work has been generated within the context of the “Urban Origins in Eastern Africa” project. One purpose of this project is to establish the chronology of the early coastal settlements, while another deals with their socio-economic organization and ethnic constitution of
early urban settlements (Sinclair 1989). The early urban settlements known in East Africa date back to the end of the first millennium AD. The earlier phases of some such settlements, i.e. Kilwa, the Lamu archipelago and Kaole, contain the traditional TIW material. It is agreed that the occupational TIW layers should be dated to the 9th–10th centuries AD (Horton 1987b, p. 316; Sutton 1990, pp. 59–60).

Before joining the project, I had had earlier experience on the Limbo EIW site on the coast of the Kilsarawe District (Chami 1987a, b, 1992b). The site was dated by C14 to the early part of the first millennium AD. This period correlates well with the period of Graeco-Roman trade to East Africa reported in the "Periplus" document and Ptolemy's Geography (Casson 1989).

In dealing with EIW problems, I recognized that the period between the end of EIW (5th century AD) and the beginning of the LIW coastal urban settlements (9th–10th century AD) was unknown. According to Phillipson (1977, p. 155),

Despite intensive search for earlier sites, it has not yet proved possible to trace back the archaeological record of these east-coast trading societies beyond the ninth century AD. This date broadly coincides with the resumed written references to the area after several centuries of silence following the Periplus.

Sutton (1990, p. 91) identified this gap as “discontinuity through the middle part of the first millennium AD”.

Recent studies in southern Africa have shown, however, that similar assumed periods of discontinuity could not withstand the evidence of new archaeological finds (Huffman 1982; Sinclair 1987; Adamowicz 1991). According to Huffman (1982, p. 139),

... there is at least one complete continuum from an EIW unit within Southern Africa to present-day Bantu speakers. I cannot point to a similar continuity in East Africa because local sequences have not been fully established.

The opportunity to start examining this problem of discontinuity in East Africa came when the planned University of Dar-es-Salaam Field School series of surveys along the coast continued in the area of our case study. Within the same area of Kilsarawe, the research work in 1987 resulted in the discovery of two EIW and two TIW sites (Fawcett & LaViolette 1990). The field work that followed the next year uncovered another TIW site in the centre of Dar-es-Salaam city (Karoma 1989). And the 1989 Field School uncovered four more TIW sites in the Bagamoyo District, two along the shore and two about 55 km into the interior (Chami 1990). Recent Field School surveys further inland from Bagamoyo to Morogoro towards central Tanzania found another three TIW sites in Lugoba, Kilosa and Dakawa (Halland, Kimathi and Reynolds, pers. comm.), and my own observation of the materials).

The recording of eleven sites in the same region within four years has, therefore, offered a real opportunity to explore the alleged gap in the coastal cultural development. This task is facilitated by comparing data with other sites containing similar or earlier cultural materials reported from other parts of the coast, including Matola and Chibune (Cruz e Silva 1977; Sinclair 1982, 1987, 1991; Moraes 1988), Monapo and Namupa (Adamowicz 1990), Dambeni-Comoros (Wright 1984, 1993), Irodo (Verin 1975, 1986), Kilwa (Chittick 1974), Limbo and Misasa (Chami 1988a, b, 1992b; Fawcett & LaViolette 1990), Unguja Ukuu and Mkokoteni (Chittick 1966a; Horton & Clark 1985),

The Urban Origin project provided a good opportunity to try to find out whether TIW sites could enable us show the connection between the EIW and LIW urban sites.

Five sites identified by the 1989 Dar-es-Salaam Field School researchers in Bagamoyo District in July–September 1990 were proposed for a feasibility study, the results of which have been reported elsewhere (Chami 1992a). Two sites on the littoral and two in the hinterland yielded positive results that, when combined with those from Misasa (Zakwati) in Kisarawe (Fawcett & LaViolette 1990), led to the fully fledged research of July–October 1991 that resulted in the present work.
2. PROBLEMS AND STATEMENTS

The first problem concerns the fact that the TIW tradition and its attendant culture are said to have originated on the northern Kenya coast. At present, two general models are proposed for this problem. On the one hand, the TIW sites, also known as the early Swahili (Horton 1987a, 1987b; Nurse 1983), are said to have been created by the proto-Sabaki, Bantu speakers who moved to the Tana–Lamu region at the beginning of the second half of the first millennium AD. After settling in the area, they learned from the passing traders and through intermarriage with Arabs and Persians how to use and make boats and, as they started trading, they moved southward to find Swahili settlements today identified by TIW pottery. Linguistic and oral traditions have been used to support the hypothesis (Nurse 1983, pp. 136–7; Nurse & Spear 1985; Pouwels 1987).

On the other hand, the northern coast of Kenya and its extension northward to southern Somalia is thought to have been the land of Shungwaya. Cushitic pastoralists controlled and influenced the affairs of this region, including trade (Allen 1983, 1993 pp. 39–52). The spread of this culture by the Sabaki-speaking Swahili throughout the coast in the 9th–10th centuries led to the beginning of the Swahili settlements (TIW sites) and the Islamization of the whole coast (Horton 1984, 1987b). A pastoral origin has been supported by reference to the seafarers’ mention of the domestication of animals on the “Zanj” coast (see Masudi, Chinese Bobali and Ibn Banut—Freemans—Grenville 1975; Horton 1984; Trimingham 1975), cattle and camel bones from Shanga (Horton 1984, 1987b), and TIW pottery in connection with the “pastoral neolithic”, ceramic tradition (Horton 1987b; Abungu 1989, pp. 147–9).

The northern coast has also been thought to have had a trade advantage in relation to the Red Sea and the northern Indian Ocean, because the monsoon winds and the oceanic currents are reliable at this latitude and permit rapid, seasonal navigation, both along the coast of eastern Africa and across the Indian Ocean to western and southern Asia (Horton 1984, p. 266, 1987b).

As the years have passed, Horton (1990) has modified his explanation of the above problem and yet has complicated it. He now considers the Cushitic pastoralists to have spread to the south to reach the central and southern coasts of East Africa. This happened in the last few years BC and coincided with the Graeco-Roman trade to East Africa in the first century AD. These pastoralists, according to him, founded the TIW settlements under study in this work. He has also stated that the EIW sites were founded on the coast after 500 AD (Horton & Mudida 1993, p. 672), a position completely untenable in the light of evidence from South Africa (Klapwijk 1974), Mozambique (Cruz e Silva 1977; Sinclair 1987, 1991; Morais 1988), Tanzania (Chami 1988b, 1992b) and Kenya (Soper 1967b).

My aim in this work is, therefore, to re-evaluate the origin of the TIW tradition with the old and new data collected from the central coast of Tanzania. This geographical area is quite far away from Somalia and the Rift Valley areas associated with ancient Hamitic/Cushitic occupation (Phillipson 1985, p. 143; Robertshaw 1990). On the other hand, the central coast of Tanzania has been shown to have been occupied by the EIW Kwale tradition (Soper 1971b; Chami 1988a, 1988b, 1992b; Fawcett & LaViolette 1990).

The second problem is the widespread occurrence of TIW sites observed at a more or less similar period of time, which has led some archaeologists to point to trade as the mode of dispersal. TIW pottery is alleged to have been produced in the hinterland of the northern coast and then traded all over the coast down to the Comoros and Mozambique (Horton 1984, p. 299; Suttion 1990, pp. 59–60).

This widespread trade is said to have been managed by the Islamized, Sabaki-speaking people, with whom the Swahili people are linguistically affiliated (Hinnesbutch 1978; Nurse & Spear 1985); hence the supposed linguistic verification of the northern origin of the TIW tradition. The TIW sites, therefore, were thought to be found only in the areas occupied by the Sabaki-speaking people, including the littoral areas and the immediate hinterland between the Pangani River to the south and the Tana River to the north (Horton 1987, p. 315).

At the 1991 Zanzibar Urban Origin workshop, I suggested a cultural unity between the littoral and the hinterland of Tanzania during the period of the TIW tradition, and hence a probable local production, but of similar pottery (Chami 1992a, pp. 30–1). Since then, two alternative forms of the trade model that would explain the similarity in the pottery have been proposed: the presence of specialists in distant settlements who were not representative of the community they
were in (Horton & Mudida 1993, p. 672) and an ethnic communality over a large part of the region (Wright 1993, p. 659).

Another aim of this work is to study the TIW pottery collected from five sites distributed over the larger zone of the central Tanzanian coast. The study includes the comparison of decorative elements, shape and fabric (Chapters 8 and 9). This will facilitate the understanding of the hypothesis of cultural unity, the origin of the tradition and the nature of its spread.

The third problem continues from the second one. Since the TIW pottery found in the hinterland was thought to have been traded there by the Sabaki traders, the littoral communities were thought to have had no communication or cultural ties with the farming, hinterland communities. The littoral people were thought to have been oriented to the ocean, after having originated from the northern coast or even the Middle East (Chitick 1977, p. 183; Datoo 1975, p. 3; Horton 1984, p. 299). In my recent work on the central coast of Tanzania (Chami 1992a) and that of Mutoro & Abnegu (1993) on the Kenyan coast, it has been shown that cultural relations existed between the littoral and the hinterland. These can be observed ethnographically and archaeologically.

I shall use the data collected from sites located both on the littoral and in the hinterland to evaluate the degree of the cultural and trade affiliations between the littoral and the hinterland. The central coast of Tanzania has also the advantage of having TIW sites from which the data can be incorporated in this kind of analysis, as is done in Chapters 8–10.
3. THEORY AND RESEARCH STRATEGIES

In this chapter, I discuss issues related to archaeological theory and how it has affected research in eastern Africa. One can then understand why the archaeologists concerned with eastern African coastal settlements have reproduced similar results for decades (Chapter 4). The theoretical discussion will also include an explanation of the particular strategies used in this archaeological inquiry.

3.1 Theory

3.1.1 Traditional archaeology

Before the 1960s, archaeology was based on the classification and description of artefacts, the results of which were used to narrate evolutionary changes, migrations of peoples and diffusion of ideas (Willey & Sabloff 1980; Daniel 1950). This tradition began around the mid-19th century, during the period when Darwinian evolutionary ideas started to predominate in academic circles. This coincided with the refining of the Three Age System (Stone, Bronze and Iron Ages) by Thomsen and Worsaae in the mid-19th century. The Three Age System was further classified into subsystems, as in de Mortillet's division of the Stone Age into the Chellean, the Mousterian, the Solutrean and the Magdalenian stages (Daniel 1950; Gräslund 1987). The two perspectives were employed to show that human cultures had evolved from earlier, primitive stages.

However, the archaeologists were not wholly evolutionary. According to Daniel (1950, p. 45), in the works of Thomsen and Worsaae, one found "the ideas of invasion, diffusion and homotaxy which formed the framework of the twentieth century". This combination of perspectives is probably better illustrated in Childe's (1951) work, where, in spite of the explanation of the diffusion of ideas from the Nile Valley and Mesopotamia, the Three Age System is correlated with an anthropological, evolutionary scheme of savagery, barbarism and civilization.

On the thesis that "savages are ... totally without initiative, without the desire or the capacity for inventing a device, a myth, or an institution" and hence "all major inventions were made but once by some chosen people" (Childe 1951, pp. 12-3), migrations and the diffusion of ideas from Egypt and the Middle East to the rest of the continents dominated the archaeology of the time. In Africa, the idea that every element of civilization came from the Middle East or the Far East has come to be known as "Hamitic/Cushitic myth" (Sanders 1969, p. 521; Amadi 1989, p. 80; Zwememann 1983, pp. 15, 67). The Hamites, according to Zwememann (1983, p. 15), were divided into the Eastern Hamites, with whom Seligman included the ancient and recent Egyptians, the Nubians, the Galla, Somali, Danakil and most modern Ethiopians. The northern Hamites include the Berber, Tuareg, Tifu, Fulani, and the Guanche of the Canary Islands.

The Hamites, who were regarded as Caucasians in the late 19th century, have been associated with pastoralism and their "negro" counterparts with agriculture. Hence, "pastoralism and all its attributes became endowed with an aura of superiority of culture" (Sanders 1969, pp. 529-30). Therefore all elements associated with civilization in sub-Saharan Africa, comprising metal-smelting, complex political institutions, irrigation, the age-grade system and all "archaeological findings of any magnitude", were attributed to the Hamites (Sanders 1969, p. 531).

Much study founded on the migratory and diffusionist theories was influenced by the "German cultural-historical school of anthropology" (Holl 1990, p. 300). For details of this school, see Harris (1968, pp. 373-92), Zwememann (1983) and Shaw, Sinclair, Andah & Okpoko (1993, pp. 9-13).

3.1.2 Modern "post-traditional" archaeology

While African archaeology continues to suffer under the plague of the "Hamitic/Cushitic myth" to the present day (Holl 1990; Shaw 1990; Shaw, Sinclair, Andah & Okpoko 1993; see also Chapter 4 in this work), European and American archaeology entered a new era after 1960.

Archaeologists adopted new paradigms and epistemological approaches (Clarke 1972; Binford 1968; Willey & Sabloff 1980). Two competing, but also symbiotic strategies in the modern epistemology, comprising inductive and deductive inferences, were adopted (Hempel 1965; Salmon 1982; Gibbon 1984). They emanated from empirical and positivist (natural sci-
ence) approaches to scientific inquiry. These strategies became prominent in archaeology after the 1960s in the rise of the "New Archaeology" (Binford 1968; Schiffer 1976; Trigger 1978; Willey & Sabloff 1980). The intention of their proponents was to break away from the non-explaining apathy of traditional archaeology. The new archaeologists (processual/behavioral) aimed at explaining past temporal and spatial processes. This was an attempt to understand past cultural behaviour in relation to environment, population, technology, social organization and ideology. The quest for laws and "middle range" theories was thought to be necessary, so as to help to develop such a science; hence the adoption of Kuhn's (1970) paradigmatic lines of thought (Binford 1972; Clarke 1978). According to Kuhn (1970, p. 8), competing schools in academic studies are normally guided by a paradigm which he took to be "universally recognized scientific achievements that for a time provided model problems and solutions to a community of practitioners".

To augment that endeavour to build up middle-range theories, ethno-archaeology and experimental archaeology were initially utilized to provide models and hypotheses that could be tested either empirically or deductively (Binford 1972; Gould 1978; Schiffer 1976). The correspondence between the hypotheses or models developed with the archaeological data was thought to help archaeologists to understand better the behavioural patterns and processes of past societies.

In the subsequent developments, some scholars have felt varied degrees of concern about the suitability of the methods of natural science for archaeology. Some, though in favour of a scientific method, have refrained from extreme positivism (Trigger 1989, 1978; Renfrew 1989). They have thought that archaeology, as a study of human behaviour, may require some general theory and consistent systematic methodology, but not necessarily laws like those of the physical sciences. Others, while not decrying the scientific approach of the New Archaeologists, thought that the approach would have been better if structural and symbolic studies had been diversified into a purely functionalistic approach in the New Archaeology (Colander 1982). On the other hand, a group identifying themselves as post-processual archaeologists have claimed that objectivity is unattainable by the use of scientific method in archaeology. To them, scientific knowledge is subject to the present-day ideologies and power politics. They have called, therefore, for the structural and symbolic interpretation of the archaeological remains, whereby the meaning of the data yielded by archaeological sites could be interpreted (Shanks & Tilley 1989).

In this work, I have regarded the above differences as a mere development of archaeological methodology. There is just an awareness among the archaeologists of the various limitations that encumber the various strategies employed for understanding past societies in the absence of concrete documentary or ethnographic evidence. However, instead of decrying one strategy in favour of another, I would advocate the use of different strategies, depending on how well a particular strategy fits one's particular problem. Archaeologists using different strategies should be aware of the subjective milieu in which they were brought up and try to control it as much as possible, so that it does not influence their research results. Post-processual archaeologists should be even more aware of this problem, since they have opted for an unsystematic method (poetic), which makes them unaccountable for whatever they propagate. As Renfrew (1989) has already pointed out, we may find ourselves writing fictitious stories, which is worse than the academic work they have been trying to criticise.

As far as pertains to this work, therefore, I have realized the possibility of utilizing both empirical and positivist strategies. The choice of the approaches from the New Archaeology is based on the fact that one can test the correspondence between the theory or hypotheses and the available data (Renfrew 1989). Various models developed in anthropology and archaeology will be employed to help to explain the archaeological occurrences on the coast of East Africa in the first millennium AD.

3.2 Research strategies

Three main strategies are concerned below. First, the empirical techniques are those emanating from the inductive part of scientific research. This is a process of building up information and ultimately knowledge from the observable data (Gibbon 1984, p. 74; 1989, pp. 8–13). Secondly, an hypothetico-deductive approach is used which is part of a deductive-nomological model of science and is the procedure in which the deduced, "testable consequences from hypotheses" are confronted with data (Gibbon 1984, p. 12; Salmon 1982, p. 34). The third is the strategy of coherence defined below.

3.2.1 Empirical techniques

Surveying in archaeology is the basic technique of locating sites and of determining how and where the data should be collected (Flannery 1976a; Bower 1986; Plog 1976). For site location, two main methods—grid
and transect sampling—have been proposed (Plog 1976). The former is effective in a more open, arid landscape. For the wetter and wooded, forest landscape, transect survey is more appropriate.

The problem of access can sometimes be sidestepped by surveying roads, especially if they are unpaved and deeply cut into the soil. Roads often sample such areas in a fairly systematic manner, and sites are frequently well exposed in them (Bower 1986, p. 27).

While the transect-survey method has been employed in some parts of Africa (Bower 1986; Sinclair 1987; Hall 1981; Odner 1971a and b; Soper 1967a), the Tanzania littoral was first studied by this method in 1987. The University of Dar-es-Salaam Field School researchers did a selective walk over a large stretch of the central coast from Kisarawe to Bagamoyo (Map 8). In 1989 and 1990, this was extended to the hinterland, reaching Morogoro, 200 km from the shore. The survey was confined mainly to the roads, open land around present-day settlements, along rivers and lake plains. Although many sites were found by this method, it is clear that many areas remained unsurveyed because of various obstacles, i.e. heavy vegetation, security risks (near military barracks) and lack of logistical resources.

For those areas surveyed, the normal method was to walk along a stretch of land 5–10 metres wide looking for cultural materials. Small pits were occasionally dug after 10–20 metres, in case some sites might have been buried immediately under the surface.

Since it proved very difficult to survey every spot in the area, local residents, who are more conversant with their environment, were also employed (Bower 1986). Residents often observe unique features when farming. When made aware of what those features could be, and encouraged to participate and understand the work of the archaeologists, these people are very willing to contribute information about sites which would have been missed by a simple survey.

As none of the above survey methods had been practised on a large scale along the coast before 1986, except for Mozambique (Sinclair 1987), the inadequate surveys led scholars to believe that the early inhabitants of the coast of East Africa only settled on the littoral and the islands. A comprehensive use of the transect-survey method has been part and parcel of the present work, and all the sites discussed in Chapter 8 were identified in this way.

Intra-site survey. After identifying a site, much work is required to establish the spatial and stratigraphical distribution of cultural material. This helps to develop arbitrary or probabilistic areas for material collection. This is necessary because, as has been shown elsewhere (Ammerman 1981; Flannery 1976a), the surface-material distribution does not in all cases reflect the nature of the sub-surface disposition:

On one hand, we have the optimistic statement of Redman and Watson (1970:280) that "surface and sub-surface artifact distributions are related so that a description of the first allows prediction of the second": On the other hand, we have the statement by my friend the Real Mesoamerican Archaeologist (personal communication, 1970) that "surface remains are just that—the junk you find on the surface—and nothing more" (Flannery 1986, p. 51).

Several techniques are available for site survey. They include augering, drilling and magnetometry. In augering, an auger is driven into the soil down to the archaeologically sterile level, bringing up samples of the subsoil. This can be repeated systematically, following the coordinates of a site map at the intervals of either 2 or 5 metres, depending on the choice of the researcher. The plotting of the results on a map should offer a clear picture of the limits of the site, the depth of the material culture, the areas of material concentration and the absence or presence of features. This task sets the scene for arbitrary or sampling excavation or structural and spatial studies of a site.

For sites with deeper stratigraphy, the drilling machine has been employed recently on some sites on the islands and along the coast (Radmilahy 1992; Juma & Löfgren 1992; Sinclair, Kokenya, Meneses & Rakatoarisoa 1992; Matteru, ongoing research). The process of drilling is done systematically, like the augering technique, but with more ability to bring up material from levels deeper than 10 metres.

Magnetometers are also effective in establishing areas with magnetically oriented materials, i.e. slag, tuyères, furnaces, iron and copper. The reading is done systematically by following grids established on a site. High-reading figures indicate possible metallurgical objects. Excavation can follow in those areas to establish the nature of the objects (Chami 1988b, 1992b).

Before 1986, the above site-survey techniques had not been practised along the coast of East Africa. Most excavations were geared towards monuments and hence did not require much of these techniques. The sites in this work, being non-monumental, required techniques to establish areas of excavations. Magnetometer work was used on the Limbo site, on account of its smelting industry (Chami 1988b, 1992), and augering was employed on every other site reported in this work. Given the shallow stratigraphy of most of the sites in this work, drilling was not applied. Details of the site-survey work are given in Chapter 7.

Seriation. The key to empirical archaeological work is the examination of the temporal and spatial distribution of archaeological materials (Shennan 1988, p. 190). This is a traditional method in archaeology, starting from the mid-19th century and, as has been well
explained by Gräslund (1987), was first applied in Africa by the Egyptologist Sir Flinders Petrie at the beginning of this century (Shennan 1988, p. 191) and applied in eastern Africa by Chittick (1974, 1984), Sinclair (1987), and Robertshaw (1990). Chronology can be delineated by artefact-grouping type-analogy and by grading type-analogy. This means sorting, describing, measuring and classifying the recovered artefacts according to their group-types, and arranging them chronologically. By comparing these with similar, well-dated group-types from other sites, affiliations and spatial aspects are depicted. The question of how to establish group-types (attribute definition and classification) is discussed in Doran & Hodson (1975, pp. 99–100) and in Hall (1983) (see also Chapter 8 in the present work).

Other chronological methods include direct dating of the associated materials, i.e. charcoal, shells, bones, wood and pottery. This can be done by carbon-14 dating or by thermoluminescence for pottery. In this work, good pieces of charcoal were collected for dating and, since charcoal is more reliable and cheaper to date, compared with the other items, eighteen samples were analysed to check on the hypothesized chronology for different sites. The chronological aspects of the stratigraphies are analysed in Chapter 10. All dates given in the text have been calibrated by the method of Stuiver and Becker (1986), unless otherwise indicated.

3.2.2 Hypothetico-deductive strategy

(i) Apart from empirical work, I have resorted to some established theories (models) to deduce hypotheses that may help us to understand the socio-cultural adaptation and changes of the first-millennium farming communities along the coast of East Africa. In the recognition that settlements (sites) are products of human occupation established by a particular culture, surviving by exploiting the natural and social environment, I have turned to the ecological and cultural, materialist schools for some guidelines. According to these two combined schools of thought, the environmental and techno-economic base is the key to the understanding of pre-modern, industrial communities in terms of adaptation and change. Qualifying this statement, Gibbon (1984, pp. 7–8) has argued that

Cultural ecology is the view that socio-cultural systems are adapted for exploiting particular portions of their environment through the use of certain technologies, and that the form of socio-cultural system is in large part determined by the ecological conditions to which it is adjusted.

Cultural materialism is viewed as supplementary to cultural ecology, so that “among these conditions techno-environmental change is the most basic determining factor in cultural evolution” (Gibbon 1984, pp. 7–8). This is because the technological subsystem has been found to articulate more closely with the environment than do other socio-cultural subsystems. A cultural materialist is, therefore, supposed to outline causal connections that proceed from the ecological systems through technology and its “organization in economic systems to the sociocultural system and culture itself” (Gibbon 1984, pp. 7–8).

My desire to recognize the coast of East Africa as an environmentally and ecologically specific region has been encouraged by the above theoretical framework. As noted in Chapters 2 and 4, scholars engaged with eastern-African, historical studies have always looked to the north of the region, in order to understand the historical and cultural processes that operated along the coast. It has been observed that this kind of paradigm has generated similar kinds of biased results for decades, hence denying the Africans the use of their long, historical experience. The theoretical framework proposed above directs us to give more emphasis to the local aspects of East Africa and find out how these could have influenced the flourishing of such ancient communities. A similar approach has enlightened students of the ancient developments in Mesoamerica (Sanders & Price 1968; Carneiro 1970) and the Aegean (Renfrew 1969). The local aspects could also have made possible the adoption of foreign techniques, foreign trade and foreign ideology. These aspects are highlighted in Chapters 5 and 6.

(ii) It has been observed that the direction of change along the coast of East Africa in the first millennium AD was from simple, early, farming/fishing-village settlements prior to the 8th century AD to the later, complex, urban settlements. It was a process from less stratified communities to stratified ones, from poor communities to wealthy ones, from fewer trading societies to more trading communities, from less populated communities to more populated ones, and from localized communities to interoceanic ones. These processes can be inferred by the empirically observable range of artefacts, constructions, sizes of settlements and site distribution.

However, one aspect remains to be explicitly demonstrated. This is the hypothesis that the EIW people were part and parcel of the cultural process that culminated in the rise of urban settlements at the beginning of the second millennium AD. I have adopted a biological-anthropological model that can offer hypotheses to test the linkages between the two cultural periods.

It is theorized that, when a particular, socio-cultural system changes into another, the latter will retain some
elements of the former (Harris 1968, pp. 164–70). The carried-over elements have been identified as either survivals or relics or remnants or vestiges. In Sanderson’s words (1990, p. 15), they are

...items of culture that had been carried by the force of custom into stages of social development beyond the one in which they originated.

While socio-cultural anthropologists can study present-day societies to verify this kind of change phenomenon, archaeologists have to infer the facts from the remains of cultural material. Past societies have left behind cultural materials that were a product of socio-cultural behaviour.

What is left in the ground from the coastal settlements common to both the EIW communities and the later, TIW urban settlements is large quantities of local pottery. Other materials, i.e. housing and smelting debris, can also help us to understand the processes of change.

Following the recognition that the two early and later cultures were confined within the same environmental niche and following the survival-element theory, I have, therefore, hypothesized that, if the EIW people participated in the process of change that led into the later, urban, settlement period, then the pottery of the latter period should bear a few elements of the former pottery. This hypothesis leads us into the problems of archaeological pottery.

(iii) Pottery has been studied in three different ways, in order, first, to identify cultural groups and, secondly, to study their movements and affiliations, their cosmology and their socio-cultural change.

The first focus, which has also been traditional in archaeology, is the study of forms and different decorative techniques and designs. This is done under a general theory that different human communities have formed and decorated pottery differently, owing to ethnic tradition and different cosmologies. With such a framework, archaeologists have used pottery, in the absence of reliable, oral traditions, to establish cultural groups and cultural interactions (Huff 1980; 1982; Collett & Robertshaw 1983; Soper 1971c; Rice 1987; Nordström 1972). According to Huffman (1980, p. 124),

Style as a part of culture is learned and possessed within groups of people, and the correlation between design style and specific groups is well known (e.g., Boss 1927). Those portions of material culture which vary stylistically can be used to identify groups of people, even though the size of the group and their other characteristics are unknown.

According to Rice (1987, p. 252), "similarity (or comparative frequencies) of design elements between groups will be proportional to the direction and intensity of society interaction between members of those groups". This theory has been referred to as "ceramic sociology" or "ethnic iconography" (Sackett 1977, pp. 376–7).

A second approach to the ceramic study has been the interpretation of the meaning of decorative styles of pottery (Plog 1980, p. 115; Collett 1993). According to Rice (1987, p. 251),

...at one level of meaning style is seen as a reflection of aesthetic preferences, conscious or unconscious; at another, style is considered to mirror significant features of the natural and social environment. Particularly useful in societies whose art...is rather strongly representational, these approaches frequently address the art's natural, mythological, or iconographic themes...

Thirdly, there has been the study of qualitative and quantitative change, as well as the substitution and integration of the decorative elements. According to Rice (1987, p. 460; see also Adams 1979, p. 727),

...that is, formal, decorative, or technological categories of pottery may be added, lost, substituted, or recombined. In fact it is those changes that have allowed archaeologists to outline many of the cultural transitions in the history of occupation and in the development and spread of civilization throughout the world.

When operating with all three approaches, it has been noted, however, that a few precautions need to be borne in mind. For the first approach, styles in material culture "can reflect social interactions, but they need not do so necessarily or exclusively" (Rice 1987, p. 253). Also one should clearly define the design elements and constructs of typology, so as to make it possible for other scholars to replicate them whenever necessary. For the second approach, unless the meaning of the elements is tied to empirical, living examples, the conclusions should be presented as subjective, with the meaning expected to differ from one interpreter to another (this is a general critique of semiotic studies in archaeology; see Renfrew 1989; Collett 1993). And for the third approach, we should be aware that pottery change is not always accompanied by political and ideological changes. In addition, radical, stylistic changes in pottery have been observed without any immediate, external causes being discovered (Adams 1979, p. 727; Huffman 1984). What is important for us in this third approach is not to correlate pottery change with the socio-politico-economic changes, but to show the continuity that existed between different historical epochs.

In this work, my chief concern is with the first and third approaches, which aim at showing cultural continuity through space and time respectively. In Chapter 8, the decorative elements in pottery and the forms and criteria for choosing them are outlined. The analysis is
conducted there, and the results are discussed in Chapter 11 in relation to the problems in Chapter 2.

3.2.3 The strategy of coherence

According to Renfrew (1989, p. 38), "the coherence approach emphasizes ... the extent to which the proposition harmonizes with the existing framework of knowledge". Some of the theories established for the coast of East Africa can be shown, by a mere examination of the literature, to be inconsistent with what is known about the coastal sites. Some of these theories were formulated to justify a particular, established position, thus leaving behind much known information, which, if well taken account of, could have established a different opinion altogether. Typical of such theories is the assertion that the Sassanid pottery found on the coastal settlements is Islamic. This has continued to be the view of all scholars up to today, although the green/blue pottery is well known to have been produced from the first millennium BC. Another typical inconsistency was the idea that coastal pottery was produced in some locations to the north and traded southwards to the rest of the coast. This idea was propagated in spite of the fact that it was known that EIW people reached the coast by the beginning of the first millennium AD and had mastered the technology of producing pottery. Moreover, the whole coast is known to have had clay for pottery-making, and the long-distance trade in local pottery would have required every economic justification.

Ideas on the inconsistency of the theories will figure directly in Chapter 11, where they will offer supplementary support to the new perspectives propounded there.

In the next chapter, I highlight the sources, methodologies and theories that have been responsible for our present knowledge of the early-first-millennium, coastal settlements.
4. INTELLECTUAL BACKGROUND

There is abundant literature that offers accounts of the people, settlements and various economic and political activities that took place in the first millennium AD on the coast of East Africa. This can be divided into three main categories: (1) travellers' reports (ancient) and (2) chronicles, and (3) the scholarly reviews of both the reports and the chronicles and the subsequent academic research (scholastic).

The first part is the information about our coast dating from the beginning of the 1st century AD, as narrated by travellers and other people from the Mediterranean states and the Middle East who were interested in travellers tales. It includes Graeco-Roman documents of the early first millennium AD and Arabic and Chinese documents of the late first millennium and the early second millennium AD. From the sixteenth century onwards, the Portuguese documents and chronicles supplemented the ancient literature. The second part, the chronicles written as histories of coastal towns and their rulers, have been the most quoted evidence for the Arabo-Persian colonization of the coast.

The third part is a process starting from the beginning of the 19th century. European scholars and travellers started documenting and studying the people and the history of East Africa. The process and the way in which the scholarly literature was accumulated is the subject of discussion in this chapter.

As Gräslund (1987, p. 2) stated, it is only appropriate to judge scientific achievement by relating it to "the situation of its own time". I have therefore divided the scholastic literature into three categories to match the different periods of its production. Early scholarship is arbitrarily the early part of this century up to 1965, when the early sources discussed above were solely used to describe the past on the coast of East Africa. The sources were used to prove or to support the then current migration and colonization theory. The latter scholarship is more related to academic research that ensued after the 1960s to assess the work of early scholarship in relation to the new information being obtained from archaeological and linguistic researches. Recent scholarship has shifted slightly from the former paradigm to focus more on the African contribution to the early settlements on the coast of East Africa.

4.1 Ancient Graeco-Roman documents and reports by Arab, Chinese and Portuguese travellers

This literature must be looked upon as non-academic. It was written for different purposes, sometimes as a guide to trade, for example, the *Periplus*, sometimes as geographical information, for example, Ptolemy's *Geography*, sometimes as sailors' tales, for example, the reports of Asian travellers, and sometimes as reports to kings, for example, Portuguese accounts. As I am going to discuss this literature in its different categories below, I would like to refer my readers to the more exhaustive discussion of these documents in Mathew (1963, 1975), Freeman-Grenville (1975), Trimingham (1975) and Horton (1984).

4.1.1 Graeco-Roman documents

In this category, there are three documents: the anonymous *Periplus of the Erythrean Sea* (AD 40-70), Ptolemy's *Geography* (AD 140), and the account of Cosmas Indicopleustes (6th century). The *Periplus*, known as the "commercial handbook of the 1st century AD" (Casson 1989), is the earliest literature we know of that discusses the coast of East Africa (Azania) in relation to the Middle East and Mediterranean regions (Map 3). It gives the routes, ports and goods involved in trade from the Red Sea to the rest of the Indian Ocean including East Africa (Map 3). Ptolemy's *Geography*, written a century later, offers similar information about the routes and the locations of ports. It is, however, less informative and in some cases confuses the earlier picture drawn in the *Periplus* (Warmington 1963, p. 65; Mathew 1963, p. 96; Sutton 1990, p. 90). Because of this, the *Periplus* has warranted several reviews, including those of Schoff (1912), Huntingford (1980) and more recently Casson (1989). The third source, the account by Cosmas, is later and mentions little about the Azanian coast but concentrates more on the interior south of Axum.

From the first two early documents, we learn that there was a market-place or emporium known as Rhapta (after sewn boats) somewhere on the East African coast. Apart from the governing Homerites (not mentioned in Ptolemy), the land was occupied by big-
bodied people who were either pirates or cultivators (word indistinct; Casson 1989 and Horton 1990). They traded ivory and tortoise shell in exchange for metal objects. The two documents also mention other ports of Azania to the north, Nikon and Serapion. The island of Menuthia is located "two runs" north of Rhapta. In the account of Cosmas, the important information is that the Axumites had pushed out the Romans and Arabs from the Red Sea, and the Persians were gaining the upper hand in the oceanic trade with Azania. The Axumites are reported to have been using the land route to East Africa, trading beef for gold in a region south of the Equator and close to the source of the Nile.

4.1.2 Arabic and Chinese documents

These have been referred to in some literature as "medieval" documents. They were written either by travellers who managed to reach the coast of East Africa (Zanj land) or by people based in the cities of the Middle East who were interested in travellers' tales.

The early Arabic and Chinese travellers' documents (c. 9th–12th centuries) are less helpful in identifying the locations of the places mentioned and in understanding the organization of the coastal people. These documents include those of Tuan Cheng-shih (AD 863), Buzurg Ibin Sahriyar of Rahormuz (mid 10th-century), Al Masudi (late 9th century) and Ibn Hawqual (10th century) (Freeman-Grenville 1975). Al Masudi is the most detailed writer, showing that the coast was inhabited by black people, with their own rulers ("fahme"). The Zanj coast had two areas known as Sofala and Kumbalu Island, the latter having a Muslim community. There was a trade connection between Siraf/Oman and the Zanj coast. Sofala produced gold, which was traded together with ivory, tortoise shell and amber. Bananas and coconuts were cultivated.

Later Asiatic documents offer us a better picture of the places and activities on the coast. Documents of this period include those of Al-Idrisi (1100–66), Chao Ju Kua (1226), Abu Al-Fida (1273–1331), Marco Polo (1295), Ibn Battuta (1331) and Abu Al-Mahasin (1441) (Freeman-Grenville 1975).
Place-names that we know today, for example, Unguja, Zanzibar, Mogadishu, Malindi, Mombasa, Kilwa and Sofala, are mentioned. Al-Idrisi and Ibn Battûta offer us better pictures of these places and their activities (see Idrisi's map in Tringham 1975, p. 138; Freeman-Grenville 1972). The people cultivated fruits, sorghum, sugar-cane, bananas, rice and camphor trees. There was mining of iron at Malindi, Mombasa and Sofala for trade, and gold from Sofala. There was pearl-fishing and the cultivation of aromatic plants. The people also hunted for skins and ivory (see Freeman-Grenville 1962, pp. 9-24). There is an indication from Battûta's report that, by the 14th century, the major settlements along the littoral were generally Islamized (Freeman-Grenville 1975, pp. 27-32).

4.1.3 Portuguese documents

The Portuguese led the way in the European ambition of having an alternative route to India and southern Asia. This would help them to avoid restrictions and blockades by the Muslims on the Red and Arabian Seas. This dream was fulfilled in 1498 by the expedition of Vasco da Gama around the Cape of Good Hope, along the African coast and on to India. Several expeditions like this generated much information in Europe about the people of the East African coast. The most relevant to our studies is the work by João de Barros entitled *Decadas da Asia*. This work repeats the chronicles' information discussed below. The Portuguese document also shows that, for centuries, the coast had developed brisk trade-links with the Arab world. Major towns competing for this trade had developed, including Mogadishu, Mombasa and Kilwa. Kilwa is reported to have controlled the southern coast as far as Sofala and the routes leading to the gold-producing Zimbabwe. Zimbabwe and its state are mentioned for the first time. The state was known to have controlled the trade as far as the shore, where merchants linked to Kilwa were operating. Cloth was a major item exchanged for gold (Freeman-Grenville 1962, pp. 120-4; see also Theal (1898) and Stranders (1968) for the Portuguese documentation).

4.2 Chronicles

The chronicles of the coastal towns date from the second part of the second millennium AD. According to Chittick (1975, p. 32) and Mathew (1963, pp. 102-4), with the sole exception of the Kilwa chronicle, which was set down in the first half of the sixteenth century, no other chronicle can be traced back to before the eighteenth century, and most are more recent.

The importance of the chronicles relative to other written sources is that they ascribe the origin of the early coastal towns to the Arabo-Persian immigrants. Awareness of this is cardinal, because the subsequent, 20th-century, scholastic literature was greatly influenced by what is alluded to in the chronicles.

The Kilwa chronicle relates the immigration of the seven princes of Shiraz. About the 10th century AD, Al-Hasan Ibn Ali, Sultan of Shiraz, sailed from Persia with his six sons and some followers to the coast of East Africa. He founded settlements on the shore of the mainland and the islands. His son Ali is alleged to have become the first ruler of Kilwa Island in 956 AD. The Pate and Lamu chronicles assert that early towns along the coast were founded by Syrians sent by the Umayyad Caliph al-Malik (AD 685-705) to settle there. Thirty-five coastal towns were founded.

The Book of Zanj (*Kitab al Zunuj*), a compilation of the chronicles of Shungwaya, Mombasa and the Arabic Treatise, is recent, being of the late 19th century. It narrates how the coastal people were converted to Islam. The work reiterates the earlier idea of the founding of coastal towns by the Arabs. It is alleged that, in the era of the Abbasid Caliph al-Mansur (754-775), an expedition was sent to crush the disloyal towns on the coast. Governors were sent by Harun al-Rashid to rule the coast of East Africa (Chittick 1965, 1975, p. 32; Mathew 1963, pp. 103-4).

4.3 Scholastic period

4.3.1 Early scholarship

We have recognized the first part of the 20th century, up to the mid-1960s, as the period of early scholarship in the East African coastal studies. This period is sustained by the fact that, before the mid-1960s, most scholars had meagre archaeological and socio-linguistic data to guide or support their arguments. Their discourses were based on data from the sources discussed above (Sections 3.1 and 3.2). A limited amount of field data was available, i.e. observed ruins, coins collected on the surface and words in the Swahili language borrowed or derived from the countries of the Middle East. For a better picture of this period, readers are referred to the key authors of the time, including Burton (1872), Stigand (1913), Pearce (1920), Ingrans (1931, 1962), Kenyon (1931), Robinson (1937, 1939), Coupland (1938), Baker (1941), Gray (1951, 1952) and Cole (1963).
In the late 1950s and early 1960s, some archaeological and linguistic works were introduced. Archaeological work on the coast was aimed at the major monuments, then in ruins. Excavations were carried out around the major house structures in Gedi and Kilwa to establish the chronology of the coastal civilizations (Chittick 1958–62, 1965; Kirkman 1959, 1964; Freeman-Grenville 1928, 1960, 1962). The main interest was in verifying the chronicles’ accounts of coastal development. Data from such works started to be integrated into the literature in the last few years of the early scholarship period. Finds of the coins of Ptolemy VIII (116–80 BC), associated with a dagger, were reported around Dar-es-Salaam. Zanzibar coins of the Hellenistic, Parthian and Sassanian periods were used as evidence to supplement the ancient documents (Freeman-Grenville 1960, 1963; Mathew 1963, Sutton 1966). These finds, however, were not made in any archaeological context (Freeman-Grenville 1960, pp. 32–4; Sutton 1966, p. 7).

With regard to the linguistic literature, the first publications about the origin and spread of the Bantu people started to appear in the late 1950s. The Bantu people, to whom the Swahili were thought to be related, were considered to have originated in the Congo–Cameroon highlands (Murdock 1959; Greenberg 1963; Guthrie 1962; Oliver 1966). Their rapid spread to the humid region of tropical Africa was thought to have been assisted by the adoption of Indonesian food plants, i.e. bananas, yams and taro, that allegedly had reached West Africa from the Ethiopian highlands (Murdock 1959). Indonesians were thought to have come to eastern Africa at the beginning of the first millennium AD, a theory imagined to be supported by the presence in Madagascar of people with Far Eastern physical and linguistic features. The early literature on the Indonesian colonization has been discussed by Oliver (1966), Vérin (1975, 1986, pp. 26–52) and Jones (1971).

A common feature of the early scholarship literature is the theory that the coast of East Africa was continuously under the umbrella of either the Arabs or the Persians or the Austronesians. The stone towns are said to have been built by the colonizing immigrants. In the literature of this period, the authors accept the authenticity of the early sources uncritically.

However, there is some debate on the identity of the indigenous people and the location of places or towns mentioned in the early documents. According to Casson (1989, p. 136), many authors seem to have thought that the indigenous people of the coast of Africa were Hamitic/Cushitic people who had immigrated from the Horn of Africa (Cole 1954, 1963; Huntingford 1963, p. 73; Ingrams 1962, p. 2; Sutton 1966, p. 7). A minority thought that they were Bantu (Kenyon 1931, p. 263; Coupland 1938, p. 12), and a few argued that they represented a transient racial amalgam, in which there was an element derived from a wave of emigration that seems to have reached Madagascar from Indonesia (Mathew 1963, p. 95). The emporium of Rhapta was thought to have been in the area between the Pangani and Rufiji Rivers (Pearce 1920; Ingrams 1931; Mathew 1963), the location around Dar-es-Salaam being the most favoured (Coupland 1938; Warmington 1963; Kenyon 1931). Menuthia Island was thought to be either Pemba, Zanzibar or Mafia, with Zanzibar the most favoured (Pearce 1920; Warmington 1963; Coupland 1938; Ingrams 1931; Mathew 1963).

4.3.2 Later scholarship (1965–80)

An important phenomenon marking the beginning of this period is the intensification of archaeological and socio-linguistic research, both along the coast and in the hinterland. The literature of this period is blended with archaeological and linguistic data.

The beginning of this period saw the occurrence of two important events. First, the introduction of Azania, the journal of the British Institute (of History and Archaeology) in East Africa. This acted as a forum for reporting various archaeological, historical and linguistic finds, supplementing Tanganyika/Tanzania Notes and Records and the Journal of African History.

Secondly, the publication of archaeological reports of the field work that had been going on along the coast of Kenya and Tanzania increased from the late 1950s onwards. Kirkman was instrumental in publishing the data from the Kenya coast, and his discussion of Gedi (1964) in relation to other sites, including Ungwana (1966), was soon referred to in the coastal literature. Chittick was even more prolific after his reports of the Kilwa excavations (1966b), Unguja Ukuu (1966a) and the discovery of the Lamu sites, especially on Manda (1967). Chittick then reinterpreted the finds of Pate (1969) and later completed two volumes on the Kilwa excavations (1974). His finds and suggestions dominated the literature of the coastal studies from the late 1960s to the early 1980s. This influence was further strengthened by the publication of the Manda volume (Chittick 1984).

In the same period, Chittick (1975b, 1977) published other synthesizing works. He maintained the opinion that the coast of East Africa was colonized by the Arabs. He supported this view with the study of the imported pottery and the architecture. At the conclusion of his 1975b work, he wrote that the Arabic/Persian colonizers came to East Africa in small numbers.
from diverse regions, but sometimes there were “more massive waves of immigration from particular areas, probably spread over years” (Chittick 1975b, p. 49).

Augmenting the archaeological literature, there were various other kinds of synthesizing books or articles on the coastal settlements or their early inhabitants. Sutton (1966, 1973) discussed the trade on the coast, extending his focus to Zimbabwe; Véria (1966) wrote on the Indonesian question on Madagascar, Hicks (1970) on the relationship between the Persian Gulf and East Africa, Allen (1974) and Pouwels (1974) on the peopling of the coastal settlements, Tringham (1975) and Chittick (1977) on the early documents in relation to the new finds and Allen (1977) and Datoo (1970) on the settlement pattern. Morgan’s (1973) geography of East Africa also dealt with the coast, discussing its environment, economic activities, people and history.

Phillipson’s (1977) chapter on the coast introduced a new viewpoint by indicating that the alleged 9th-century pottery had elements of the EIW tradition. This meant that the early urban settlements had an African foundation, in opposition to the prevailing Arabo-Persian theory. His claims were further strengthened by his 1979 report on the Tana Valley TlW sites. He again argued for a connection between the Tlw and the EIW traditions. From his Tana site, the Tlw tradition came to be labelled “Tanga” (Horton 1984).

In the hinterland, research took place in the period 1965-80. Much of this was directed to the iron-working sites, later to be known as the “Bantu Project” (Soper 1971a). This endeavour had in fact started in the early 1960s, when some archaeologists had already attempted to explain the spread of EIW communities in eastern and southern Africa (Posnansky 1965; Fagan 1965). However, serious attempts to compare the pottery from different EIW sites, in order to establish the direction of migration and the group affiliation, started to appear after 1966. Posnansky (1967, 1968) continued to be instrumental in the interlacustrine region, and later Schmidt (1978). Lelesu in central Tanzania was reported by Sutton (1968). Soper (1967b, c, 1977) and Odner (1971a, b) operated in the immediate hinterland and the eastern highlands of Tanzania and Kenya. Meanwhile, similar studies were being carried out in central and southern Africa (Robinson 1973; Phillipson 1968a, 1974; Fagan 1965; 1970, 1976; Klapwijk 1974; Cruz e Silva 1977), the result being the establishment of an iron-working tradition, according to Soper (1971b, p. 6), known as the “Southern African Early Iron Age Industrial Complex” or just the “Early Iron Age”. Local variants within the complex were identified (Soper 1971b, c; Huffman 1970). According to Soper (1971b, p. 8): These variants are based entirely on differences of pottery typology and geographical distribution and should be viewed in this light, although they may reflect variations of culture in a broader sense.

The East African local variants were recognized at Urewe around the lake zones, Lelesu in central Tanzania and Kwale on the coast (Soper 1971c). From the studies, it was hypothesized that the EIW people had spread from the interlacustrine region, where they were established by the mid first millennium AD, to the rest of eastern and southern Africa along three migratory routes, the western, central and eastern (Huffman 1970; Phillipson 1976, 1977; Soper, 1971b).

What is crucial for East African coastal archaeology is the shared view that the EIW people from the interlacustrine region occupied the coast of East Africa in the early centuries AD, producing pottery known as Kwale (Soper 1967b, 1971b, c). On reaching the coast in the early part of the first millennium AD, the producers of Kwale pottery are alleged to have migrated to southern Africa to occupy the southern part of Malawi (Robinson 1971) and southern Mozambique (Cruz e Silva 1977) and then to Transvaal in South Africa (Klapwijk 1974).

The archaeological work in the hinterland was closely related with the linguistic work that had been focused chiefly on the Bantu speakers (Phillipson 1977; Ehret & Posnansky 1982). As regarded the coast and the eastern highlands of Tanzania and Kenya, linguists and historians were involved in a debate on how Bantu speakers had originated from the mythical land of Shungwaya. McIntosh (1968) accepted the myth as true for all north-eastern Bantu-speakers, including the Chaga, Taita and Kikuyu. Others (Sabewal 1967; Fadiman 1973) accepted the myth but saw it as applying only to fewer groups, including the Mijikenda, Pokomo, Taita and Segeju. Hiensetsch (1976) clarified the problem by showing that the groups that shared the myth were represented by Sabaki-Seuta-speakers, comprising the Kenya coastal groups of Pokomo and Mijikenda and the Swahili of the coastal, stone towns.

In terms of the development of knowledge, the researchers of the later scholarship period, compared with their predecessors, gradually became aware of the possible, early occupation of the coast by Africans, for example, the EIW (Bantu) people, though they were not quite convinced. Their awareness was owing to the finding of an EIW site at Kwale and in South Pare dated to the 3rd century AD (Chittick 1975b, p. 18). Chittick (1977, p. 189) later expressed his scepticism again when he argued that the coast had no sites predating the 9th-century period and none that had never had trade goods from the Islamic world, specifying such sites in the hinterland. He argued that such hinter-
land sites had no cultural relationship with the coastal sites.

Apart from the above awareness, some scholars continued to believe that a "Cushitic-speaking population like the stone bowl users of the Kenya Rift Valley" (Oliver 1978, pp. 373-4) had occupied the coast in the first millennium AD.

On the other hand, the coastal researchers still failed to relate the littoral and the hinterland or the urban settlements and the EIW tradition. This problem was neglected, despite the hint already given by Phillipson (cf. above) that the TIW tradition at the beginning of the occupations of the stone towns was closely linked with the EIW tradition. The assumption continued to be that the coast had no relationship with the agricultural hinterland (Chittick 1977, p. 189). The question of cultural change was neglected both in the hinterland and in the littoral.

As the period of later scholarship came to an end, however, some scholars seemed to have discovered that the problem causing all the vacillation above was the Hamitic/Cushitic and migration paradigm of the traditional archaeology (Chapter 3). Allen (1977) heralded a new era of theoretical framework by decrying the theory that Arabs and other Asians had founded the coastal settlements. He argued (p. 361) that such theory was based exclusively on documentary sources, "most of them written by casual visitors from outside Africa, supplemented by archaeological evidence from Kilwa, Gedi and a few other sites".

In the hinterland, iron-working research was also under review. According to Garlake (1978), researchers in that field had failed to demonstrate diachronic processes because the paradigm in operation was that of traditional archaeology. Reviewing Phillipson's (1977) work, Garlake (1978, p. 459) put forward an idea that marked the tendencies in the post-1980 scholarship:

Archaeologists interested in Iron Age Africa seem to have reached an impasse. They are not able to come to terms with causes of change in the societies they study.... As a "traditional" archaeologist, Phillipson sees his work as providing "the lower storey", even "the foundations for the prehistorians' edifice" on which the "new" archaeology can develop its own concerns. But the foundations of a science do not rest on data but on paradigms. It is the theoretical underpinning of Phillipson's edifice— one we at present all inhabit—that most needs renovation.

In the last few years of this period, there was also an attempt to understand the smelting technology used in Africa. This was a positive shift from the regular pottery studies. The experimental method advocated in the New Archaeology was applied for the first time to the study of iron-smelting (Schmidt 1980, 1978; Merwe 1980). It was found that, from the mid first millennium BC, Africans had been producing steel iron, a development not witnessed in the other continents (for a rebuttal, see Rehder 1986).

Given the mid-first-millennium BC dates reported by Schmidt, questions started arising on whether archaeologists and linguists could agree on the question of the origin of the EIW communities. Gramly (1978, p. 108), for instance, highlighted the fact that the linguistically assumed origin of the Bantu in the Niger-Benue region (primary nuclear area) and the subsequent spread from the secondary area south of the Congo forest contradicted the early archaeological dates from the Lake Victoria region.

Gramly (1978, pp. 109-112) went further, refusing the migration approach and suggesting that "Bantu was spoken for millennia in many of the same regions where it is found today and that the Negro and other African populations have remained in lands which they occupied before the advent of food-production, ceramics, and metals".

4.3.3 Recent scholarship

Research and theory after 1980 were revolutionary, in the sense asserted by Kuhn (1970, p. 4). Strategically, archaeological excavations have been supplemented by ethno-archaeology and economic, spatial and ceramic analysis models, both on the littoral and in the hinterland; the nature of iron technology has been addressed for the first time, and there has been a paradigmatic shift towards the recognition of Africans' involvement in the early coastal civilization spreading from Somalia to Madagascar.

For the littoral stretch, this period can reasonably be argued to have been inaugurated by an issue of Paiduuma (1982), which was published in honour of James Kirkman. In this publication, Allen continued to depart from the earlier period of scholarship by suggesting that the people identifying themselves as Shiraz (alleged to have founded towns) were Africans, who, in their bid to assert their status among the coastal people, were posited as Persians. Allen argued that archaeological finds and linguistic and oral tradition do not suit the Persian origin of the coastal people and their settlements. Shepherd's article extended our attention to the southern coast of East Africa, where the early Swahili traders are known to have gone as far as southern Mozambique. She showed how the traders crossed the Mozambique Channel to Madagascar and the Comoros to avoid the Mozambican current. Sinclair reported on the Chibuene (TIW) settlement in southern Mozambique, which has similar cultural materials to those of Kilwa. For the first time, the people responsible for
TIW were shown to have reached the southern part of eastern Africa.

The linguists Nurse (1983) and Nurse and Spear (1985) contributed also to the change of paradigm and methodology. By the use of comparative and glotto-chronological linguistics, they suggested that the Swahili tradition occupying the coastal towns down to the Comoros had originated from the Lamu Archipelago region. They showed that the culture had its origin in the Bantu speakers, who, on settling in the Lamu area in the latter part of the first millennium, saw the passing Middle East traders, learned to make boats and to trade from them, and, as they started to intermarry with these people, a Swahili group was formed, who then moved southward to found new settlements; hence the origin of the early coastal towns (Nurse 1983, p. 315).

In other publications, the southern extension of the TIW tradition was further supported by Wright (1984), who published the archaeological report on the early occupation of Dembeni and other sites in the Comoros. In the same year (1984), coastal scholarship saw the production of two other works from northern Kenya by Chittick on Manda and another by Horton on Shanga, giving us the northernmost perspective of the early, coastal, TIW culture. In the work by Chittick, we still see the survival of the old paradigm. He regards Manda as an Arab colony but is for the first time aware of the large quantity of local wares on the site that formed "the greatest part by volume even in the early periods" (1984, p. 217). Chittick offers a flimsy explanation of how local pottery predominated in a settlement of immigrants. He suggests the existence, in the vicinity of the stone-built towns, of African settlements that would have produced the pottery and traded it to the town-dwellers.

Horton, just like Allen (1977, 1982), takes advantage of this problem to suggest that the founders of the TIW settlements, i.e. Manda, Shanga and Kilwa, were Africans rather than Arabian immigrants. By the use of substantive economic models, Horton grapples with two major issues, one being the origin of those early Africans and the other concerning the fact that the TIW pottery similar to what had been found in association with Sassanid pottery in the earliest levels of the Lamu Archipelago had been found elsewhere, i.e. in Usambara, Unguja Ukuu, Kilwa, Chibuene and the Comoros.

As regards the first problem, Horton found himself being carried into the well-entrenched, traditional paradigm by arguing that the early Africans who founded the littoral settlements were Pastoral/Cushitic in origin. After being attracted to the coast for temporary or seasonal trade fairs, they settled down and passed on their tradition, including trading and pottery-making, to their Swahili successors, who later spread it south to the rest of the coast:

Definite evidence that some of the inhabitants of Shanga were at least pastoral in origin comes from the identification of a few camel bones from the site (Horton 1984, p. 232).

The Swahili people, in collaboration with alleged, incoming, foreign traders who settled and intermarried with the Africans, continued to be marine-oriented. From this northern position, a new coastal culture was born and spread to the rest of the southern coast along the shore. "Geographical factors, such as favourable winds and currents and vegetation, put the northern Swahili coast in a particularly good position with regard to the trade of the western Indian Ocean" (Horton 1984, p. 266).

On the second problem, Horton (1984, p. 299) deduced that, since the founders of the TIW tradition were traders and not farmers, they would have little to do with the hinterland. Because of this, he thought, the finding of TIW pottery in the hinterland, i.e. in the Usambara hills, was a function of trade from the littoral, as this pottery was made by non-farming people. Horton does not discuss, however, how the descendants of the Cushitic/Pastoral people came to adopt the Bantu language.

In his follow-up articles, Horton (1987a) went a further step to argue that the early Swahili people were not just the recipients of trade goods from the Arabian traders but were also seafarers sailing all the way to the Red Sea and to the Persian Gulf to convey goods. This marks the period of great prosperity for the coast, when items like gold, precious stones and ivory from East Africa were reaching as far as Europe.

In another work, Horton (1987b) made a step backwards to balance his theory of Pastoral/Cushitic origin by arguing that the early African founders of the early littoral settlements were Bantu Sabaki speakers. This was probably owing to the fact that linguists had found that the language of the early Swahili had been Bantu. Capitalising on this, Horton (1987b, p. 315) jumped into another difficulty by arguing that the spread of TIW tradition southwards would have ended at the River Pangani in the hinterland, except for the littoral, where the Swahili carried it further south to Mozambique and the Comoros. This is the supposed distribution of the Sabaki-speaking groups. He, however, argued that the TIW pottery tradition had nothing to do with the EIW tradition but was a pastoralist tradition (1987b, p. 315).

In his 1990 article, Horton reiterated his Hamitic/Cushitic paradigm by denying the existence of the EIW sites along the coast in the early centuries AD (Horton 1990).
The early-first-century date of the *Periplus*, and the implication of a population settled for a considerable time on the coast and in commercial contact with the Red Sea, would rule out early, iron-working, Bantu communities. Radiocarbon dates from sites producing Kwale ware or on the southern coast with Matola-tradition pottery indicate settlement later than the time of the *Periplus* (1990, pp. 96–7).

Instead, Horton suggests the Cushitic/Pastoral settlements, which would have traded with the Graeco-Roman traders.

Abungu (1989) has proposed the coming together of the pastoral and farming communities in the Archipelago area, creating the early Swahili settlements. He has, however, identified their pottery as of pastoral origin. Pursel (1987) and Sutton (1990) have also supported the idea of the Lamu Archipelago origin of the coastal tradition.

Extending the new perspective to the south, Viérin (1986), in his major survey of the northern Madagascan coast, has suggested strong cultural and economic linkages between the early northern settlements in Madagascar and the African coast. While the date for the coming to Madagascar of the Austronesian immigrants is undecided, he suggests, on the other hand, that the Madagascan communities have borrowed as much from African culture as from Indonesia.

Focusing on the mainland, Schmidt’s reports (Schmidt 1983, Schmidt & Childs 1985) continued to use ethno-archaeology and experimental approaches to the study of iron technology. Schmidt and Childs (1985) showed in their work similarity between the EIW and the present-day smelting technology. This led to a controversial theory that early iron technology in sub-Saharan Africa was an independent invention and was complex on account of its preheating system and the production of carbon steel iron (for a rebuttal, see Rehder 1986). Huffman (1982), using ethno-archaeological data (pottery sequences and cattle byres), established chronological social change in southern Africa, showing that “a uniform geographical and chronological break in historic lines is not evident” (1982, p. 139).

The 1980s also saw the completion of several dissertations on the hinterland. Collett’s (1985) thesis re-examined the EIW peoples’ migration models developed in the 1970s. By using ethno-archaeological evidence of the south–north movement of the Mfecane from South Africa to East Africa, he suggested that the spread of the early farming people was generated by conflicts in the nucleus areas, sending the breakaway groups past the frontier zone, and a repetition of this movement generated a long-distance spread of the early farming communities. Kiriana (1990) repeated an ethno-archaeological approach to suggest that the traditional theoretical link between pottery and ethnic groups may have been wrong, since differences in pottery can be a function of individual artisans changing styles for various reasons, including competition. Sinclair (1987), working on sites in Mozambique and Zimbabwe, used empirical and spatio-temporal models to show that multi-variate factors are necessary to understand the development of state formations, for example, Zimbabwe. Factors such as environment, access to trade routes, raw materials and farming land should be taken into consideration when dealing with various kinds of social-political organizations. Sinclair also adopted Huffman’s (1980, 1982) cultural-continuity models to show how communities had changed from the EIW period to recent times.

Despite all the revolutionary initiative brought forward by the last period of scholarship, one can still learn from the literature how difficult it is to disentangle the mind from the diffusionistic/migrationistic and Hamitic paradigms (Chapter 2). Scholars are still seeking for the origin of developments along the coast in the first millennium to the north of the East African coast, where it is closer to the Arabic and Cushitic world. The core of the region, i.e. the coast of Tanzania, is regarded as inert.

In concluding this chapter, it is worth noting some publications that bring us up to the 1990s. Kirwan (1986) and Casson (1989) have re-assessed the Graeco-Roman documents. They have strongly suggested that the *Periplus* document was first written between AD 40 and 70 and that the emporium of Rhapta was located in the area around Dar-es-Salaam. Casson has re-interpreted the people of Rhapta as having been “cultivators” instead of “pirates” as formerly. It should also be noted that several, coastal, EIW sites have been reported as dating from the first few centuries AD (contrary to Horton, above). They include those in Kisarawe (Chani 1988a, b, 1992b; Fawcett & LaViolette 1990) and those in Mozambique (Sinclair 1991; Sinclair, Morais, Adamowicz & Duarte 1993), dating to the beginning of our era. Various articles in the Proceedings of the Urban Origin Conferences, edited by Sinclair and his colleagues (1988–1993), have also contributed new information about the nature of the ancient farming communities all over the coast.

I have discussed alternative models in Chapter 3, where I have called for closer study of the homeostatic factors that could have conditioned adaptation and change in the coastal communities, instead of just looking to the north of the region. Better understanding of such local conditions would offer a better picture of how both internal and external conditions worked in the past to shape what we are studying. Maggs & Whitelaw (1991) give a good summary of this
approach in southern Africa. In proposing this, I am quite aware of the ambiguities embedded in archaeological data, and in Chapter 3 I have suggested the need for curbing our subjective tendencies in the interpretation of the finds. In the next chapter, I discuss the environmental factors that might have played some role in the past cultural adaptation and change.
5. ENVIRONMENTAL SETTING

5.1 Introduction

It has already been mentioned that the aim of this work is to deal mainly with cultural chronology, change and spread in the first millennium AD on the East African coast. Part of this aim entails the recognition that the processes of change and spread took place in particular, environmental contexts. It is therefore necessary to describe these environmental contexts, which could have affected or conditioned the processes of change under study.

The interplay between environment and culture has become one of the central studies in anthropology, archaeology and geography (Steward 1956; Ellen 1982; Carlstein 1980; Steward & Murphy 1977; Witter 1957; Carneiro 1970). Although environmentalism had a strong influence in America between 1940 and 1960, according to Willey and Sabloff (1980, pp. 149–50):

Such concerns in environmental archaeology in America had a much earlier inception in European prehistory, and American archaeologists undoubtedly were influenced by these pioneer old-world studies. For instance, in Scandinavia, an interest in environmental reconstruction can be traced well back into the nineteenth century and, in Great Britain, Sir Cyril Fox, O. G. S. Crawford and Graham Clark had long been working along these lines.

The major influences of 20th-century environmentalism, however, came from the German Friedrich Ratzel’s “anthropological school”, with the predominant message that differences in natural habitat “were often regarded as sufficient to explain cultural diversity” (Ellen 1982, p. 2). Most of the researches conducted by the German school were concentrated in Africa (Zwernemann 1983). The inclination of these scholars to diffusionism led to its downfall in the early 20th century, leaving the American cultural sphere and ecological studies to predominate (Zwernemann 1983; Harris 1968). In recent years, some early, mechanistic, ecological studies have been discredited for their environmental determinism. They have now been supplemented by economic and system theories (Harris 1968; Clarke 1978; Ellen 1982; Gibbon 1984).

My intention in this chapter is not to submerge this work in the environmental aspects of either ecological, geographical or spatial studies. These deserve their own research. This work just draws attention to the natural features, climate, soils and vegetation of the coast, in order to create a better understanding of the resources and obstacles that would have conditioned ancient settlements. My aim is to set the cultural processes in their environmental background.

5.2 The extent of the East African coastal belt

The coast of East Africa is part of the eastern-African coastal belt, which extends from southern Somalia (1° N.) to the mouth of the Limpopo River (25° S.) in southern Mozambique (Map 4). According to White (1983), it is a strip about 3000 km long and between 50 and 200 km wide, except where it penetrates further inland along broad river valleys like that of the Ruvuma. It is very narrow on the northern coast of Mozambique and wider on the central coast of Tanzania, where it reaches the hills of Nguru and Uluguru.

The coastal strip includes the major islands of East Africa, Zanzibar has an area of 1660 km² and extends 85 km from north to south and 39 km from east to west. Pemba is 980 km² in area. The total area of the coastal strip is 336,000 km² (White 1983; Morgan 1973).

I shall confine the following discussion to the coast of Tanzania and Kenya (former British East Africa). As far as the environment of the southern coast is concerned, I may refer to Verin (1986), Sinclair (1987), Morais (1988) and White (1983).

5.3 Physical environment

The environment of the East African coast is mostly that of the land below 200 m above sea-level. Only a few scattered hills and higher plateaux occur. They include the Shimba Hills (c. 400 m), Mirina Hill in Kenya, the Pugu Hills, the Rondo (Mwera) Plateau in Tanzania, and the Maconde Plateau (986 m) in northern Mozambique. On the outskirts of the coastal zone are the eastern Usambara Mountains (1500 m) and the Uluguru and Nguru Mountains (1000 m) (Map 4).

Seven major rivers enter the Indian Ocean, but none of them is navigable. Given the level of development reached by the early-second-millennium culture, the absence of navigable rivers has been used to explain why there was minimal extension of the early trading communities to the deep hinterland (Datoo 1975, p. 6;
The whole coast of East Africa has a mean temperature of c. 26°C but this diminishes steadily southward. The
range is quite minimal. Warmer temperatures, coupled with warmer waters, have provided favourable conditions for the growth of marine life, such as the polyps responsible for coral reefs. The importance of these reefs for the coast of East Africa from early times has been discussed above.

According to White (1983, p. 185; Map 5), the rainfall is mostly between 20 in. and 50 in. (508 mm and 1270 mm) per year. It increases closer to the equator on the southern and northern coasts of Kenya and Tanzania respectively, including the islands of Pemba and Zanzibar. The East Usambara Mountains, Zanzibar and Pemba receive the highest annual rainfall (Amani, 76.6 in./1946 mm; Wete, 77.3 in./1946 mm). The rainfall is adequate for agriculture, as is shown in section 5.6.

Among the most crucial, climatic factors relative to the developments on the coast of East Africa are the monsoon winds. These winds bring precipitation and stormy weather to the coast, and these effects differ from those of the north-eastern and south-western winds (Map 5). Alternating with the position of the sun, the north-east monsoon blows between November and February, a period of fair weather bringing precipitation to the coast south of the equator; the south-west monsoon occurs from May to August, when the winds are very strong and bring precipitation north of the Equator. The reversal of the wind direction causes two annual rainfall seasons on the northern and southern coasts of Tanzania and Kenya respectively, plus the islands of Pemba and Zanzibar. This makes the coastal strip wet enough to support forests and perennial crops, i.e. bananas, coconuts and fruits.

Another respect in which the winds are important relates to commerce. Since the EIW period, the monsoon winds have also been used to propel boats (or ships) bringing traders to and from East Africa, hence the expression "trade winds". The knowledge of how the winds operated became an absolute necessity for the trade links between East Africa and the northern states of the Red Sea, the Persian Gulf, India and other parts of Asia. The same was true for the links between the East African local settlements ranging from Somalia to southern Mozambique. Different Arabian traders who happened to have knowledge of this climatic factor in trade are known to have kept it secret from the Mediterranean traders for centuries, in order to maintain their trade monopoly (Casson 1989, p. 11).

Discussions of how the traders exploited the winds have been carried on by Datoo (1975), Horton (1984) and Casson (1989), among others. According to Casson (1989, p. 283), what made both routes possible were the monsoons, the winds of the Arabian sea and western Indian Ocean that blow from the north-
east during the winter months and then conveniently switch to the southwest during the summer.

By using these two wind directions, it was possible to sail from the Persian Gulf to Zanzibar or from Malabar to Madagascar. While the trip to East Africa was made in fair weather, the return trip was dangerous, owing to strong winds accompanied by storms. Because of this, the dhows set their northward course either with the build-up of the south-west monsoon in April or with the tail-end of the monsoon in September (Datoo 1975, p. 4).

The monsoons also determined the trade movements all over the coast. The winds reached the southern coast of Tanzania in January over its greatest areal extent. From there, the winds are no longer steady, and movement southward depended on the strong Mozambique, ocean current. To return from the Mozambican ports, traders went across the southward-flowing Mozambique currents to the west coast of Madagascar, where they entered northward-flowing currents that carried them to the Comoro Islands. There, the south-west monsoons are strong enough to drive dhows to the coast of Tanzania. A foreigner interested in trading as far south as Sofala had to be prepared to spend about a year in East Africa. The trade to these southern parts of East Africa was, therefore, easily monopolized by the Kilwa traders, who had easy access to the gold-producing hinterland of Zimbabwe, making it possible for the northern traders to get goods without delay. Hence, the prosperity of the Kilwa town (Datoo 1975).

5.5 Sea-level fluctuation and marine terraces

It is also important, in discussing the TIW sites of the first millennium AD, to bring the reader’s attention to the sea-level changes of our time on the coast of East Africa. I have already mentioned elsewhere (Chami 1992a) that, although the question of the marine terraces has been very superficially related to the archaeological sites (Chittick 1962; Åse 1978, 1987, 1981), there has been in the geophysical sciences an active discussion on the existence and development of the marine terraces in East Africa (Alexander 1968, 1969; Cooke 1974; Temple 1970, 1971; Kaaya, Boenigk 1986).

The marine terraces on the coast of East Africa are better observed in the area between Dar-es-Salaam (to the south) and Malindi in Kenya (to the north). Several terraces have been observed and named after the location where they were first identified (Alexander 1968, p. 138). They are Sakura, Tanga and Mtoni. Beach terraces are also observed in some places.

Similar terraces may differ in height in different places. According to Alexander (Åse 1978, p. 220), the Sakura terrace ranges from 30 up to 115 m above sea-level, the Tanga terrace from 18 to 30 m above seal level and the Mtoni terrace from 3 to 11 m.

In the area around Bagamoyo, Cilek (Åse 1987, p. 282) found that “the cliff of the Mtoni terrace is about 8 to 12 m high and typically developed between Bagamoyo and Kaole, where it forms the shore line”. Between the Mtoni terrace and the present beach, Chittick (1962), Cooke (1974) and Åse (1987) have identified another recent terrace, a beach terrace about 2 to 3 m high (Fig. 1).

Controversial dates based on coral and shells have been presented for the formation of the terraces (Åse 1987, p. 286; Kaaya, Boenigk 1986, p. 314). Sakura and Tanga are dated to different periods of the Pleistocene before 24,000 BP and Mtoni to the late postglacial age between 1500 and 6000 BP. The beach terrace
(Fig. 1) is dated to "late medieval times (c. 500 BP)", which is said to correspond well with the Kaole ruin site, originally founded on the beach terrace between the 13th and 16th centuries AD (Åse 1987, p. 286).

The implication of these dates is that the archaeologists should not expect to find pre-4th-century-AD, iron-working and Stone Age sites on the Mtomé and beach terraces. By then, these terraces were under water. As indicated elsewhere (Chami 1992a, p. 32), such sites could be found some distance beyond the present-day littoral.

As it will be discussed in Chapter 8, the sites of Mpiji and Kaole Hill are located on the Mtomé terrace, and the Changwehela and Kaole ruins on the beach terrace. The dates of the Changwehela and Kaole ruin sites (Table 21 and Fig. 27) indicate that the last, major, sea-level change that created the beach terrace occurred about the end of the first millennium. The effect of that in relation to the settlements' realignment or the dislocation of resources is yet to be studied.

5.6 Soils

The description of the soils below has been abstracted from Milne (1935), Russell (1977) and the FAO-UNESCO description of general African soils (1977, 1978). The FAO-UNESCO (1988) soil types QC, BC, NE, etc. have been compared with Russell (1977) to produce Map 6.

The soils of the coast are derived from three parent rocks of sedimentary nature. The inland margin of this rock, forming the coastal foot-plateau above 300 m, consists of continental sediments of Karoo age, largely of sandstone and shales. The ocean side consists entirely of marine deposits, which have been laid down
successively against the edge of the older mass. In Kenya, an outcrop of Jurassic sedimentary rock occurs between the two above. The plain soils below 200 m above sea-level are yellowish-brown, sandy clays, acid in reaction and poor in organic matter. They are permeable to a depth varying from 30 to 120 cm below the surface. The soils are calcareous, owing to the marine, sedimentary, parent rock (Map 6: QC and QF).

The river plains (valleys) and the lagoons have rich deposits of clay and loams. These include the Tana and Webi-Shebelle valleys to the north, some parts of Malindi, Pangani on the northern coast of Tanzania, the Ruvu and Rufiji valleys and the Ruvuma valley to the south (Map 6: GP/IE/GH, VP).

The area above 3000 m on the mountains forming the fringes of the coastal belt, Usambara, Uluguru and Nguru, has, according to Milne (1935, p. 90)

... red-brown, orange-brown or yellow-brown, pervious, structureless leached soils, whose bright subsoil colours persist practically to the soil surface in spite of a high content of organic matter in the foot. The soils are acid throughout the profile, and their clay-fraction shows them to be fairly far advanced in laterisation (silica/petrograde ratio 1.5 to 1.0 or less). They are derived from rocks of the "ancient crystalline complex", mainly of acid types—gneiss, granulite, pegmatite; and the dissection of the Usambara mountain block is such that they are mostly found on step slopes or narrow ridges.

Except where these soils have been disturbed by shifting cultivation, in areas such as eastern Usambara, such soils support rain-forest resources, i.e. wood and other biomass. These kinds of soil are part of a sub-section of the great soil group that has, as yet, received no better name than "the laterised red loams" (Milne 1935, p. 90; Map 6: BC, FR, NE, AO/FO).

The agricultural potentialities of the coast of East Africa can now be assessed. A study combining the length of the growing period and the soil types has been conducted (Map 7 and Table 1). According to this, the coast of East Africa has been shown to have the potentiality to cultivate the various crops illustrated in Table 1.

Given the number of growing days, ranging from 150 to 209 in the agro-ecological zones 5 and 6 (Map 7, FAO 1980, p. 109), many crops can be cultivated on the coastal strip of East Africa (FAO 1980, p. 109), as shown in Table 1. These include sorghum, millet, beans, sugar cane and rice, which have a longer history in Africa than other plants of recent introduction, i.e. cassava and maize. We have already seen in Chapter 6 that most of these, including bananas and coconuts, had already been domesticated on the soils of East Africa at the end of the first millennium AD.

Given these agricultural potentialities, supplemented by fishing and hunting (Chapter 6), and assuming that the conditions in the period under study were the same as today (Hamilton 1982), the coast of East Africa could have sustained large agricultural communities.

### 5.7 Vegetation

White (1983) provides the most detailed account of the vegetation of the coast of East Africa. What should be noted here is that the vegetation of the study area is defined as the Zanzibar–Inhambane floral mosaic, placed by White (1983, p. 59) under mapping unit 16, which he identifies as the East African coastal mosaic. Under this mapping unit, the Zanzibar–Inhambane mosaic falls under units 16a and 16b (Map 8). Unit 16a comprises vegetation which has been "so extensively modified by man that it is impossible to map the different physiognomic types separately". Unit 16b maps the patches of forest.

Typical remnants of such wooded land are seen in

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Table 1. Agricultural suitability of the soils on the coast of East Africa.

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Abbreviations: CAS = cassava, WH = wheat, SOR = sorghum, MIL = millet, KEA = bean, SOY = soybean, SCA = sugar-cane, MAI = maize, WPT = white potatoes, SPT = sweet potatoes, REC = rice. In the matrix, S = suitable, VS = very suitable.
Map 8. East African coastal vegetation (abstracted from Russell 1977. For 15a, 16b, 54b see Chapter 5).
the wettest part of the coastal fringes, the Usambara, Uluguru and Nguru Mountains (Map 8:2). Intensive agricultural activities have transformed the ancient forest on the moister, coastal lowland into savanna-like communities (Map 8:4).

According to White (1983, p. 189), this secondary grassland and wooded grassland are typical and extensive on both the islands and the mainland. They are a mosaic of agricultural crops, grassy fallows and secondary thickets, according to White (1983, p. 189), dominated by “lantana”, and orchards of “cocos”, “asacardium” and “mangifera”, which, when the canopy is not too dense, often have a carpet of grass. In places, trees from the original forest have been left standing. The palms, mangoes and cashew nuts are locally conspicuous.

Swamp forests (Map 8:8) occur on the lagoons, estuaries, creeks and silted parts of the shore. Mangrove forests are typical of these places and have been exploited by coastal communities from ancient times for their hard wood for local and export purposes. They also host a variety of marine food resources, for example, shellfish, crabs and fish (Msemwa 1990).

The remaining major part of the coast is woodland-bushland intermediate (Map 8:5) in northern Tanzania and Kenya. South of the Pangani River is the tsetse-infected, miombo woodland (Map 8:3).

What should be noted in relation to this work is that the geographical zone that has been identified with the distribution of TIW sites is generally forested or wooded. Research aimed at re-drawing the picture of the ancient coastal vegetation would probably shed light on the nature of the ancient settlements, the forest/wood resources then available and the problems created by such heavy vegetation. What can be noted in this archaeological research is that the coastal, savanna-like vegetation is a product of man’s slash-and-burn agriculture (above) and commerce (Elton 1874). As regards the latter, it has been reported that the “msandaru-gum-producing tree” was a dominant forest tree all over the coast, thickly lining the shore in ancient times. The depletion of the ancient forest can be shown today by the fact that the tree can be found only far towards the hinterland on the slopes of the Nguru and Uluguru Mountains over 200 km away from the shore (Elton 1874, p. 230).

What is also clear today is that the wooded/forested lowland of the East African coast is infested with tsetse flies (Bourn 1978; Hamilton 1982, pp. 19, 22) and that serious agriculture has to go hand in hand with clearing vegetation and the active protection of crops against wild animals, i.e. primates and swine. From the forests, people still obtain fruits, honey, hunted animals and birds. These could have been more abundant in ancient times.

Consequently, although some cattle, goat and sheep bones have been found on the TIW sites, the people now occupying the coast of East Africa rarely keep cattle, goats or sheep, owing to the tsetse flies, the lack of pasture, due to the encroachment of the forest, and the absence of tradition. Only in areas largely cleared of wood, for example, Kaole, is this practised, giving the people a mixed economy. It has, however, been shown in southern Africa that areas infested with tsetse flies today maintained domesticated animals in different periods in the past (Maggs & Whitelaw 1991, p. 16). This means that the wooded/forested areas now infested by the flies might have expanded or contracted in the past (Sinclair 1987, p. 47), owing to different conditions, including clearing and burning (Morais 1988, pp. 30–33). The idea, therefore, that the TIW sites were found and occupied by pastoralists (Horton, 1990) will certainly require re-evaluation (Chapters 6 and 11).

It should be noted that, while it is possible to show how the occupants of the littoral adapted to several of the factors discussed above, the same task would require more research as regards the hinterland occupants. We know of too few settlements of this early period in the hinterland to develop a clear, adaptive pattern. On the few sites that we know of, however, their subsistence and crafts depended very much on the good agricultural soils, the lacustrine resources available around the settlements, the availability of enough rainfall and clean water for daily use, and the existence of raw materials for metal-smelting, i.e. ferrous, lateritic rocks and red soils. These aspects will be discussed in the next chapter, in which I shall discuss the economic activities of the ancient coastal communities, which reflect their efforts to harness the environment for subsistence and commercial purposes.
The importance of the techno-economic system has been discussed in detail in Chapter 2. Gibbon (1984, p. 180) has defined the techno-economic system as that part of a social system that mediates between human beings and their natural surroundings:

More specifically, at the community level the techno-economic system is a buffer between the human population, the rest of a community's sociocultural subsystems, and the natural setting.

Gibbon has also identified the main elements of techno-economic systems as

- modes of subsistence and production, tools and machines, procedures for allocating goods and services, rules for regulating economic activities, and the knowledge that makes all of these activities possible (p. 180).

This chapter is therefore divided into two sections: production, which deals with various technologies and crafts and with subsistence activities; and trade, which is important in the allocation and distribution of goods. In the discussion, most information is obtained from the archaeological data. An attempt to link the first-millennium techno-economic activities with both ethno- and documentary data has been made by Horton (1984, pp. 246-306).

6.1 Production

6.1.1 Metal-working

The EIW communities of East Africa knew how to smelt iron and make tools and weapons from probably the middle of the first millennium BC onwards. On the assumption that these early communities were also agricultural, the adoption of iron technology offered them great possibilities of expanding by exploiting virgin land, clearing of woodland and conquering enemies (Phillipson 1985, p. 148).

The earliest, iron-using sites in East Africa have been found in the interlacustrine region. Studies of iron-smelting there have shown that intensive and sophisticated technology was known that led to the production of steel (Schmidt 1980, p. 340; 1978). Such technology in the interlacustrine region resulted, according to Schmidt, in dense concentrations of population, over-exploitation of the natural environment (especially forests), and significant economic, political and possibly religious influences.

Much less is known about the farmers occupying the coast of East Africa in the early part of the first millennium AD. However, their knowledge of iron-smelting gave them a technological advantage in adapting to the marine and terrestrial environment of the coast. A study conducted at the Limbo site on the Kisarawe coast of Tanzania has shown that intensive smelting took place there at the beginning of our era (Chami 1988a, 1988b, 1992). A trench measuring 2 x 1 m, excavated to a depth of 3 m, yielded about 113.96 kg of slag (Figs 2a and b). Together with the material collected from the other three trenches, over 150 kg of slag were collected. Such intensive production has been attributed to an effort to cope with a demand for the tools required for clearing coastal woodland, agriculture, warfare, fishing, boat-building and probably...
trade. The few metal pieces found on the site included elongated nails and awls.

Other E1W sites on the coast have shown signs of smelting, though not as much as Limbo. At the Kwale site, an iron arrowhead, some slag and a piece of tuyère were recovered (Soper 1967). In Mozambique, Adamowicz (1992) has reported smelting at the Nanapula sites dated to the second century AD (Sinclair, Morais, Adamowicz & Duarte 1993, p. 421). In Zitondo, “the earliest known occurrence of a major smelting site in Southern Africa”, dated in the 1st–3rd centuries AD, “105 samples of slag have been recovered from the occupation levels in 22 of the excavated trenches” (Sinclair 1988, p. 7; Morais 1988).

In the T1W tradition, the smelting of iron continued unabated. Chittick’s excavations at Kilwa (1974, pp. 438–59) and Manda (1984, pp. 203–12) and Horton’s at Shanga (1984, pp. 260–61) yielded some slag and many iron objects. They comprised knives, arrowheads, hooks, wire wound round fibre cores, rings and bangles. Furnaces have been found in Manda (Chittick 1984, p. 211) and Shanga (Horton 1984, p. 260). In Chibuene in southern Mozambique, “twenty-one lumps of ferruginous material, two hook fragments, one nail and one spike were found” in layers pre-dating 1000 AD (Sinclair 1982, p. 162). All T1W sites excavated on the mainland and reported in Chapter 7 yielded some slag, pieces of tuyère and iron objects. At the 9th–10th-century sites on the Comoros, Dembeni and Sima, ... slag and iron fragments were common. ... It is clear not only that iron tools were used on these sites, but also that iron was locally smelted and forged (Wright 1984, p. 45).

Apart from iron-smelting, there are strong indications that other kinds of metals were worked on the coast of East Africa. The earliest evidence of copper-smelting on the coast comes probably from the reported copper crucibles at Kisiju (Harding 1960). While Harding reported that the associated materials could be dated between the 4th and the 15th centuries AD (p. 136), Chittick’s crucibles at Kilwa were later than the 9th century AD. However, the early adoption of copper-smelting technology along the coast is confirmed by the finding of many copper objects at almost all the T1W sites. The copper objects found at Kilwa and Manda (Chittick 1974, pp. 438–59; 1984, pp. 203–12) comprised rings, beads, chains, bangles, fish-hooks, curved copper wire, vessels, metal sheeting, nails and kohl sticks. In Ungwana, Abungu (1989, p. 174) reported copper chains, rings, and rods/kohl sticks. In Chibuene, the copper objects included a fragment of copper sheeting, a spike, a bracelet fragment of wire twisted round a fibre core and two copper beads (Sinclair 1982, p. 162). Similar copper objects recovered from the mainland sites of Tanzania are reported in Chapter 7.

The Kilwa and Manda excavations have also shown that other metals, for example, gold and lead, were exploited and worked at the end of the first millennium AD. These metals could have been exploited from earlier times. Continued research on the coastal sites may offer us a better picture of these other metals. Lead has been found to have been worked at the T1W site of Mpiji, which is dated to the 7th century (Chapter 7).

6.1.2 Other crafts

Apart from metalwork, the coastal people developed other crafts which were probably important for their adaptation to the coastal environment. Pottery-making for both domestic use and the storage of water and foodstuffs appears to have been a dominant craft from the early farming period. All iron-working sites found on the coastal strip have yielded pottery (Soper 1967a; Sinclair 1987; Morais 1988; Chami 1992a and b; Adamowicz 1991). Chittick (1974, p. 317), for instance, recovered over one million sherds from Kilwa alone, and Horton (1984, p. 257) recovered one hundred thousand from Shanga.

To facilitate fishing and communication among the coastal communities, the construction and use of boats might have started from early in the first millennium AD. Big fish identified on the littoral sites by their bone remains required boats that would take fishermen to the deep waters (Chittick 1974, p. 235; Horton & Mudida, 1993; cf. Chapter 7 in this work). Finds of E1W pottery on sites such as Unguja Ukuu and Kilwa Kiswani (Sinclair, Morais, Adamowicz & Duarte 1993, p. 427) and Bazaruto in Mozambique (Sinclair 1987) indicate that the E1W farmers had managed to sail across the channels to the islands. This is also testified by the Periplus report that the people of Rhapta sailed in sewn boats (Casson 1989). In the LIW period, from the middle of the first millennium AD, the boat-making craft must have been improved so that the people of the coastal communities could sail long distances for trade. This is supported by the proliferation of T1W settlements on the littoral and on the islands of Zanzibar (Chittick 1966a, Horton & Clark 1985), Pemba (La Violette, pers. comm.) and the Comoros (Wright 1984).

Apart from improving boat technology, the coastal communities had also probably mastered the knowledge of trade winds which was necessary for sailing long distances.

Bead-making seem to have been another major pre-occupation. This is indicated by the finding of many
"bead-grinders" (Chittick 1974, pp. 414–15, 1984, pp. 135–56; Abungu 1989, pp. 72–3; Chami 1992b; see also Chapter 7). The large number of "bead-grinders" found on TIW sites indicates that production might have been geared to local needs and trade (Chittick 1984, pp. 28–9). Considerable quantities of finished and unfinished beads have been found at Kilwa, Manda and other sites (Chapter 7). Other beads were made from bone, ivory, clay, and precious stones (Chapter 7). Rock crystals were also worked, as these were found at the lower levels of Shanga and Manda as finished beads, wasters and lumps. “East Africa is well known as a source of rock crystals to Egypt” (Horton 1984, p. 255).

Cloth-making, probably from cotton, is indicated by the finding of spindle whorls at Kilwa (Chittick 1984, p. 236), Manda (Chittick 1984, pp. 156–57) and Shanga (Horton 1984, p. 252) and Ungwana (1989).

In the TIW period, it seems, people learned the initial technique of obtaining lime. Burnt coral stones and coral and shell floors have been found in the TIW occupational layers at Kilwa (Chittick 1974, p. 22), Mwali Mdjini on the Comoros (Chanudet 1991), Unguja Ukuu (Juma, pers. comm.) and Kaole (Chapter 7). The use of lime and coral stones for serious construction was introduced at the end of the first millennium AD, and by the 13th century hundreds of settlements dotting the littoral had houses and tombs built in this material (Chittick 1974, 1984; Horton 1984, 1987b; Freeman-Grenville 1962). Mudbrick houses have been reported from the northern site of Manda, dating from the beginning of the TIW occupations (Chittick 1984, p. 217). Many houses in this period, however, were of mud and wattle (Allen 1980; Wright 1984; Chittick 1984). The exploitation of wood, especially mangrove poles, for house construction went hand in hand with building technology, as may be seen in the ruins on the coast.

6.1.3 Subsistence

The primary subsistence activity of the EIW communities was probably farming (Phillipson 1985, pp. 147–48; Morais 1988, pp. 137–43; Sinclair 1987, pp. 143–44). Little archaeological data, however, exists to offer a better picture of the early farming activities. Only in Silver Leaves, a site identified with Kwale pottery, have seed impressions in pottery been reported as bulrush millet (Klawijk 1974).

Cultivated millet and possibly sorghum and Citrullus species were recovered from the 6th- and 8th-century sites of Magogo and Ndondondwane in the Thukela Basin, and cultivated sorghum was identified as SK17 in the Kruger Park (Maggs & Whitelaw 1991, p. 17). This evidence is also coupled with the widespread occurrence of grindstones, indicating widespread cultivation in the first millennium AD (Maggs & Whitelaw 1991, p. 17). Documentary evidence from the Periplus AD (40–70) also indicates that the inhabitants of Rhapta located in the vicinity of present-day Dar-es-Salaam were farmers (Casson 1989, p. 253).

In the succeeding TIW period, more archaeological evidence for farming is available, giving further evidence that cultivation was probably widespread over a large region of sub-Saharan Africa. Coconut seeds and millet and rice have been found in Ngazidja in the Comoros (Wright 1984, p. 261), and Horton (1984, p. 261) has reported a coconut scraper. Coconut shells have also been found at Misasa, Mpiji, and Kaole (Chapter 7). Sorghum has been reported from Kilwa (Chittick 1974, p. 236) and Nampula (Sinclair, Morais, Adamowize & Duarte 1993).

Arabic documents report the cultivation of crops such as sorghum, millet, bananas, rice and sugar cane at the beginning of the second millennium AD (Horton 1984, pp. 229–30; Freeman-Grenville 1972).

Domestic animals might also have supplemented the food crops in some settlements. Goat and sheep bones have been reported from Chibuene (Sinclair 1982), Manda (Chittick 1984), Shanga (Horton 1984), the Comoros (Wright 1984, p. 53), and probably Mpiji (Chapter 7). Cattle and camel bones have been recovered from Shanga (Horton 1984, pp. 231–32). Other animals included the cat, chickens and domestic fowls (Table 4). This implies that the ancient people of the coast practised mixed farming, a tradition still followed on the coast today, where the land is open enough to allow some domestication of large animals. Mixed farming, however, does not mean pastoralism.

For the littoral and lacustrine sites, fishing and shellfishing were definitely another major source of food. All such sites have been reported to have yielded large amounts of fish-bones, shells, turtle and crabs (Chittick 1984, 1974; Horton 1984; Wright 1984; Sinclair 1982; Horton & Mudida 1993). Bones of dugong, crocodile, turtle and whale, together with shells and crabs, have been recovered in large amounts at Mpiji (Table 4). Hunting for wild animals is indicated by the finding of iron arrowheads at the Mpiji site (Fig. 11) and the bones of wild animals, comprising the dik-dik, duiker, bush buck and bovid, and various kinds of birds at Shanga (Horton 1984, p. 233). Adding to the Shanga list, the Mpiji site yielded a lot of bones, providing evidence of a wide range of hunted animals, including the dik-dik, bovids, dugong, oviscaprids and pig (Table 4). Hence, both marine and terrestrial resources were equally exploited.
6.2 Trade

In the literature dealing with the development of the East African coastal settlements, the question of trade has figured as the most important. Some literature has been devoted entirely to trade (Sutton 1973; Ricks 1970; Horton 1987a; Shepherd 1982). Over emphasis on trade has conditioned scholars to attribute the early coastal development to the Middle East traders and immigrants (Chapter 4). While this one-sided approach is avoided in the present work, I recognize the economic importance of trade in the development of the early coastal culture.

From the first century AD, traders were known to have exploited the monsoon winds to visit East Africa. According to the *Periplus* (Casson 1989, p. 61), the principal imports into the ports of East Africa were “spear from Muzar of local workmanship; axes; knives; small awls; and numerous types of glass stone”. To certain places, wine and grain were brought in considerable quantities. East African ports exported a great amount of ivory but inferior to that from Adjutis; rhinoceros horn; best-quality tortoise shell after the Indian; a little nautilus shell.

What confuses coastal researchers today is the fact that at the beginning of the first millennium AD, the coastal people were producing iron (Soper 1967b; Cruze Silva 1977; Chami 1992b). Why should the same people have imported what they were producing? It may have been that the Azanians exported iron ore and imported finished goods or rather supplemented their products with better-quality ones.

After the middle of the first millennium AD, many TW settlements flourished all over the coast. The excavated sites of this period have yielded a variety of imported goods, comprising glazed ware from the Persian Gulf and China, glass vessels and glass and precious-stone beads (Chittick 1974, 1984; Horton 1984; Wright 1984; Sinclair 1984; cf. Chapter 7).

Horton (1984, pp. 266–82; 1987b) has gone further than the archaeological data to examine the Arabic and Chinese documents on the trade goods (Freeman-Grenville 1962). In the latter part of the first millennium AD, the major imports that would not have survived archaeologically comprised cloth, rice, soap, wheat, indigo, butter and oils. The items exported comprised slaves, ambergris, ivory, crystals, skins and tortoise shell (Horton 1984, pp. 262–71; Masao & Mutoro 1988, pp. 613; Datoo 1975, pp. 17).

Gold was probably exploited from this period but is first mentioned by Al-Masudi in the 10th century (Freeman-Grenville 1962, pp. 15–7). According to Datoo (1975, p. 17), Summers estimates that “gold-mining began in Rhodesia in about AD 600”, while Sutton (1973) suggested a date in the 9th–10th centuries AD. Recent archaeological work has, however, indicated a date in the 8th century for the beginning of gold-working in the Bulawayan system (Sinclair 1987, p. 148; Duarte 1993, p. 42). It is agreed, however, that the gold trade became important after the end of the first millennium AD, especially the 12th–14th centuries AD (Datoo 1975, p. 17; Sutton 1973; Sinclair 1987, p. 149).

Although little is known about the trade in gun arabic in Africa before the 18th century (Elton 1874; Webb 1985), many grains of fossilized (glassy) gun arabic have been found on the Limbo TW site (Chami 1988a) and on the Misasa, Mpiji and Kiwangwa TW sites (Chapter 7). From Elton’s report (see Chapter 5), we learn that the forest of “msandarius”-gun-producing trees that once covered the coast had been depleted after centuries of gun-copal exploitation. No doubt the association of these products at the above sites implies such trade in ancient times. As mentioned above, except for Limbo, these sites were connected with the interoceanic trade.

For the first millennium AD, very little is known about the trade going on between the East African communities; on the one hand, between the littoral communities and, on the other, between the littoral and the hinterland communities. But it is obvious that the TW settlements on the mainland and the islands had trade links by which the goods sent to and received from the interoceanic trade were collected and distributed. It is likely that there were major ports, i.e. Kilwa, Manda, Unguja Ukuu, Kaole and Chibune, which would have played the role of gateway communities (Datoo 1975, pp. 28–41; Hodge 1982; Horton 1984, p. 306). In such centres, elites could exist. The wealth resulting from such groups of people is indicated archaeologically by the variety of expensive and prestigious, local and foreign goods, for example, metal objects, glazed wares, glass objects and monumental constructions. Feeder ports would then develop, acting as intermediaries between the centres and the hinterland communities.

It is likely, therefore, that local traders spread goods like glazed ware, glass and beads to the rest of the coast (Abangu & Mutoro 1993; cf. Chapter 7 below). This could well have involved foodstuffs, fish and salt (Horton 1984) and the products of local crafts, i.e. shell beads, iron and copper products, graphite and to some degree probably pottery.

The question of how far the first-millennium trade went to the hinterland remains unresolved. However, it can now be shown that it reached more than 200 km into the hinterland. The finding of TW sites over 300 km inland from the Tanzanian coast (Chapters 1 and 7)
with cultural affiliations with the littoral sites indicates that trade links between the littoral and the hinterland probably went further than was previously thought (Chapters 2 and 4). In southern Africa, glass beads and marine shells traded from the eastern coast reached the first-millennium-AD sites of Botswana and South Africa (Maggs & Whitelaw 1991, p. 15; Horton 1987a, p. 86). The significance of the emergence of trading elites, gateway and feeder communities, and far-hinterland, peripheral communities is discussed in Chapter 11.
7. FIELD WORK

As I said in Chapter 2, there are three issues related to the TIW tradition which this work addresses: first, the idea that the tradition first emerged on the northern Kenya coast; secondly, that the TIW pottery was spread through trade; and thirdly, that the TIW tradition was a culture oriented to the ocean rather than to the hinterland. The identification of several TIW sites both in the hinterland and on the littoral of the central coast of Tanzania offered a chance to evaluate these issues.

The central coast of Tanzania and its hinterland lie between the Wami River to the north and the Rufiji River to the south. On this coast are located the historical towns of Bagamoyo, Dar-es-Salaam, Kisiju and, to the south, Kilwa. The offshore islands comprise Zanzibar, Mafia and Chole and Kwale near Kisiju. These inland regions are linked to the littoral by the Rufiji, Ruvu and Wami Rivers (Map 9).

Taking the central coast of Tanzania as a case study, two factors make it a perfect area for investigating the above problems:

First, the area is remote (about 500 km) from the northern-Kenyan pastoral, Neolithic (Cushitic) influence. Similarly, the case-study area is away from the northern coastal strip alleged to have been favoured by the trade winds that made commercial transactions possible between the region and the other ports on the periphery of the Indian Ocean (Horton 1984, p. 266; also Abungu 1989, p. 31).

Secondly, assuming that the EIW people were immigrants from western Tanzania, the case-study area is located in the settled zone, where the early, iron-using communities would have settled and established themselves first before spreading northward and southward to the rest of the eastern-African coast (Soper 1971b; Phillipson 1985, pp. 173-4; Chami 1992b). EIW sites have been discovered here, providing evidence for EIW occupation from the beginning of the Christian time (Map 2).

In this chapter, I report on the field work conducted on the six sites in the case-study area. The sites comprise Misasa on the Kisiju hinterland, Mpigi and Changwehela on the littoral north of Dar-es-Salaam, Kaole near Bagamoyo, and Kiwangwa and Masuguru in the hinterland of Bagamoyo (see Maps 10 and 11). Misasa had been identified and test-excavated by the University of Dar-es-Salaam field researchers in 1976 (LaViolette, Fawcett & Schmidt 1989; Fawcett & LaViolette 1990). The rest were identified by the University of Dar-es-Salaam field researchers in 1989, but not excavated (Chami 1990).

The field research reported here was organized in two phases. Phase One, which was between June and July 1990, consisted of reconnaissance. It was aimed to resurvey the sites identified by the 1989 Field School in the Bagamoyo District and to conduct test excavations; by this, I would be able to assess the potentialities of the sites for further comprehensive research. Phase Two, July to November 1991, was earmarked for more comprehensive work on the sites found to yield more information on the problems mentioned in Chapter 2 above. The sites preferred for this phase comprised Misasa, Mpigi and Kiwangwa.

Below, the discussion starts with the sites on the Bagamoyo littoral, moving into the Bagamoyo hinterland, and then to Misasa in the Kisiju hinterland.

7.1 Mpigi

The site of Mpigi (6° 32'S., 39° 08'E.) is 27 km south of Bagamoyo town, 6 km to the east of Mapinga village on the Dar-es-Salaam—Bagamoyo road, and 1 km north-west of the mouth of the Mpigi River (Map 12). The site is located where the marine terraces (cf. Chapter 5 above) are quite outstanding. It lies where the Mtoni terrace slopes gently into the old terrace (Fig. 3). The 3-km-wide, Mtoni terrace is of sandy-loam clay, covered mainly by patches of secondary forest as yet uncleared. The forest plays host to a number of wild animals, including swine and primates. The beach terrace is 2 km wide and colonised by salt-tolerant plants, including mangroves (where the sea water still reaches). It is a perfect habitat for crabs and shellfish. There is a clear indication that the site was a port. The fact that today the shore is 2 km away implies that the sea-level has dropped or that there was siltation after the 7th-century AD date of the site. These events could have caused the ground-water level to go down, as is
Map 9. The central littoral and hinterland of Tanzania.

Map 10. The hinterland of Kistiju with Misasa and Limbo sites.
Map 11. Excavated sites in the Bagamoyo district.

Map 12. The littoral of Mpiji and Changwehela.
indicated by the dry marsh on the site (Map 13). Whether they had an effect on the settlements will be discussed in Chapter 11.

In Phase One, the site was found to be undisturbed. It was mapped by using the theodolite (Map 13). Stakes were placed at intervals of 5 m on the north–south and east–west diagonals. These enabled us to establish grid points, on which a hand auger, 15 cm long and 5 cm wide, was used to establish the area of material concentration. Samples of soils from the augering holes were also tested by applying phosphate. The result showed that the concentration of organic matter to have coincided with the area of cultural-material concentration (Map 14).

Three trenches were then excavated by using trowels. The first trench measured 1 x 2 m. It was placed at the centre of the cultural-material concentration identified by augering. The first three levels (0–30 cm) were of olive-grey, compact sandy-loam-clay. Few artefacts were recovered from these levels. The next three (30–60 cm) were of very dark grey, compact sandy-loam-clay with high concentrations of cultural materials. The last two levels (60–80 cm) were of brownish, calcareous sandy-loam-clay with few cultural materials (Fig. 3). The materials collected comprised TIW pottery, bead-grinders, tuyère fragments, slag, iron objects (blades, arrowheads, projectile points, wire wound round fibre cores, rings, hooks), copper objects (copper beads, copper chain, copper bangle), imported pottery (Sassanid pottery, Chinese stoneware), beads (of glass, shell and clay) (see Figs 10–14, Plates 1–2), gum copal, bones and shells (Tables 4 and 5a, b).

Trenches 2 and 3 were outside the area of material concentration (Map 13). Few artefacts were recovered from these trenches, with their homogeneous, brownish, sandy-loam-clay deposit. Trench 2 was dug down to 90 cm, but only level 3 (20–30 cm) yielded artefacts. In trench 3, only the first level yielded artefacts.

Six fragments of charcoal were recovered for C¹⁴ dating: one was from level 4 (30–40 cm), two from level 5 (40–50 cm), two from level 6 (50–60 cm) and one from level 8 (70–80 cm). It was not possible to determine whether these fragments of charcoal were from a tree trunk or branches.

Fig. 3. Mpiji. Cross-section of the Mtoni and beach terraces.

Six fragments weighing over 3 g were selected for C¹⁴ dating. One fragment was chosen from level 6 and another from level 8. The results are discussed in Chapter 10 (Table 21 and Fig. 27, Lab. Nos. Ua-2087 and Ua-2088).

The Mpiji site was one of those selected for Phase Two research, because it had yielded a great variety of artefacts (above) and the dates obtained from the above
Map 13. Mpiji site plan.

- contours with 0.5m interval
- road
- raised sand beach
- dry maran - possible ancient lake
- baobab tree
- DP datum point
- excavated trench
- excavated trench

Legend:

- contours with 0.5m interval
- road
- raised sand beach
- dry maran - possible ancient lake
- baobab tree
- DP datum point
- excavated trench
- excavated trench

Map 13. Mpiji site plan.
charcoal samples were of the 7th century, earlier than the conventional, 9th-century date of the early coastal settlements (Chapter 2).

The previously surveyed area was extended both to the north and to the south-east. More extensive excavation was conducted in the area identified previously as having rich deposits of cultural material. A 2 x 2 m extension of the previous trench 1 (Map 13) was excavated to the south, and later a 2 x 2 m trench was excavated to the west towards the upper terrace. The occurrence of cultural material and the nature of the soil followed the pattern previously described above (Phase One). This time, the change was in the occurrence of cultural material past the 80-cm level of the previous excavations to 100 cm, owing to the sloping ground.

Away from this area of material concentration, another 2 x 1 m trench was excavated to the south-east of the site (trench 4, Map 13). It was placed in an area identified by surface material.

Apart from the pottery and glass collected from the surface, the lower levels down to 50 cm yielded shells only (Terebralia palustria). The soil was compact, brownish loam.

It was mentioned above that the material concentration on the site is found on a slope of the Mloni terrace eroded down to the beach terrace. To investigate the deposits on the slope, a trench (cross-section), 0.5 m wide and 13.5 m long, joining the upper and lower terraces via the excavated trenches, was dug (Fig. 3) down to the sterile level. It was found that the area on the slope had been used as a dump by the upper-terrace occupants. The soil of the beach terrace was olive-grey sand in the upper 20-cm layer and then whitish beach sand.

The finds listed (Table 2) include those found in Phase One. TIW pottery formed the bulk of the material, with a total of 5538 sherds, 937 (16.9%) being decorated (Fig. 9). Two hundred and forty bead-grinders, mostly made of potsherds, were also recovered (Fig. 10). Iron-work was indicated by 16 fragments of tuyère and 20 of slag, 89 iron objects, three iron arrowheads, and six hooks (Fig. 11). Copper-working was indicated by 26 beads, a chain and a bangle (Fig. 12).
Table 2. Amounts of remains collected from Mpiji in 1990 and 1991. The top layers of some of the trenches had no remains (1991, trenches 1 & 2).

Abbreviations: Tr = trench, Lv = level; (a) = decorated sherds, (b) = undecorated sherds, (c) = bead grinders, (d) = tuyère, (e) = slag, (f) = iron fragments, (g) = iron arrow, (h) = iron book, (i) = knife, (j) = copper chain, (k) = copper bangle, (l) = lead, (m) = imported sherd, (n) = glass fragments, (p) = glass bead, (q) = shell bead, (r) = other beads (bone, clay), (s) = gum copal, (t) = bane, (u) = shell; + = present. "c. sect." at the bottom of the table = cross-section.

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</tr>
</tbody>
</table>

Astonishingly, 11 pieces of lead (Fig. 12), not found in the previous excavations, were recovered. They were bent to create a hollow cavity, perhaps for a string.

An important element of the finds is the imported material. About 27 pieces of Sassanian Islamic sherds, most of them in the form of bead-grinders and highly brittle, one sherd of white-glazed, Chinese porcelain and 152 pieces of early glass were recovered (Fig. 14 and Plate 1). Most of the glass fragments were of greenish and yellowish tints, with the surface decaying into a golden patina. Four glass and 215 shell beads were also recovered (Fig. 13 and Plate 2). Two more grains of gum arabic were recovered.

The occupants of the site consumed a lot of fish and shellfish, with fewer terrestrial animals. Most of the bones are very decayed. The countable pieces of bone amounted to more than 3271, and the shells to 1600. The analysis of the bones (Table 4) was made by Kimengich, of the Kenya Museum, and that of the shells (Table 5a, b) by Msemwa, of the Tanzania Museum. The subsistence implications of these finds have already been discussed in Chapter 6.

7.2 Changwehela

The site of Changwehela (6° 32'S., 38° 34'E.) has been described before in relation to the ethnographic data collected in the area about its history (Chami 1990). It is 23 km south of Bagamoyo, 3 km north of Mpiji, and
6 km north-east of Mapinga (on the Dar–Bagamoyo road, Map 12). The site is on a ridge bordered on the north and east by salt-pans; to the west by forest on the Mtoni terrace, extending all the way to Mpiji; and to the south by mangrove swamps. The site itself is covered with thick, thorny brush.

Only one trench was dug in the area, where numerous potsherds were being eroded from a wall foundation cut across the northern edge of the beach-terrace ridge. This disturbance occurred probably during the construction of the salt-pan at the beginning of this century. All the levels in the 130-cm-deep stratigraphy yielded artifacts, but the greatest quantity was recovered from a depth of 70 cm. The stratigraphy was regular down to 80 cm and irregular below this. It started with a dark greyish-brown, sandy loam to a depth of 80 cm, followed by a very dark grey stratum with heavy, yellowish mottling. A pure-yellow soil appeared at 90 cm and continued to sterile sand. The waterlogged level started at 130 cm (Fig. 4a, b).

The finds mainly comprised potsherds of the first part of the second millennium AD. Concretions of lime sand (used for house-plastering) and molluscs were also found (Table 5a, b). Two charcoal samples weighing about 2 to 3 g were recovered from levels 8 and 9 (early occupational layers). The results are discussed in Chapter 10 (Table 21 and Fig. 27, Lab. Nos. Ua-2089 and Ua-2090).

7.3 Kaole

Kaole (6° 29'S., 38° 57'E.) is probably well known for its famous, 13th-14th-century-AD tombs, which have attracted many people visiting Dar-es-Salaam and Bagamoyo. The site has been reported since the late 1950s (Chittick 1958-62; 1962) and has featured in many other publications (Freeman-Grenville 1962; Chittick 1970; Mturi 1974; Sutton 1990). It is situated 4 km south of Bagamoyo, the present-day Kaole village being on the beach terrace. The first-millennium site is on the edge of the Mtoni terrace, from which artefacts are being eroded to the lower beach terrace (Fig. 1 and Map 16). This site is covered by patches of thick brush, extending southwards from the village and the ruins. The road to the ruins cuts through the site (Map 16). I have called the first-millennium-AD site "Kaole hill", to differentiate it from the Kaole ruins (Map 15).

Mapping was done at the hill site only (Map 16). Owing to the great deal of time taken in clearing the brush on the site, only the one-hectare area covered by

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**Fig. 4a.** A section of the slope at the excavated area at Changwehela.

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**Fig. 4b.** The eastern profile of trench 1 at Changwehela. (Other wall profiles are uniform).
Map 15. Kaole sub-island with hill and ruin sites.

the cultural-material concentration was mapped. The sub-surface concentration of material was identified by augering over the open area. Systematic augering would have required much work in clearing the brush.

Trenches 1, 2, and 4 were excavated in the area of cultural-material concentration. They were dug with trowels. The stratigraphy of the upper units above was similar, with a top layer of dark-brown, sandy loam (to c. 30 cm) overlying first dark-to-gray and then basically reddish-yellow, loam deposits (Figs 5a, b).

Artefacts of different periods were collected from the levels. The lower levels (60-90 cm) yielded first-millennium, TIW-tradition materials. The 30-60-cm level had artefacts typical of the Kaole ruin phase, dated to the 13th–15th centuries (Mturi 1974). The surface levels had more recent material.

Trench 3 was dug lower down the hill, where a stone wall was observed. The first two levels consisted of very dark-grey loam. This was followed at 20 cm by the top part of the structure first thought to be a wall. It comprised a horizontally continuous layer of coral rag, mixed with shells, as well as other artefacts packed together like a pavement. This continued down to 45 cm below the surface. Below this layer, a reddish-yellow layer with coral and shell pieces was encountered. The artefacts collected from trench 3 were those of the Kaole ruin phase (Fig. 5c). Only one sherd of the TIW tradition was found in association with the coral and shell fragments at the lower level. Some previous excavations in the ruin area had also indicated that the earliest level there had few sherds of the TIW tradition (Chami 1990, 1992a). This indicates that the ruin period was a direct continuation of the TIW tradition.

The following material was collected from the site: 545 potsherds of the first and second millennia AD (Fig. 9 and Table 6); 115 “bead-grinders” (Fig. 10), some daub and lime concretions, 29 fragments of imported ceramics (early Islamic, sgraffito and Chinese), beads of glass and copper, corroded iron, slag and fragments of tuyère, remains of coconut, and fish and mammal bones.

Several charcoal samples were recovered from different layers. Three of them were selected for C14 analysis. One was from trench 1, level 9, one from trench 3, level 6 and one from trench 4, level 7 (Table
Masuguru (6° 22’S., 38° 28’E.) is 55 km to the west of Bagamoyo (Map 11). It is the site of a present-day village situated on a hill bordered by a man-made lake to the west, forest to the south and west, and open agricultural land to the north (Map 17). The soils on the site are leached, reddish-brown clays, but the soils of the forested and agricultural area are dark, compact clays and the latter are used for growing maize and millet.

Systematic survey of the site was hampered by the houses. However, by augering along the streets and the backyards of the houses, we were able to identify areas with material concentrations, in which all four trenches were excavated. The trenches, which all measured 1×1 m, except for the first one, were dug down to 50 cm to the beginning of sterile deposits. At the depth of 30 cm, the stratigraphy changed from dark-grey, loose, clay deposits, to sticky, reddish-yellow, clay deposits (Fig. 6).

Except for unit 1, which showed disturbance at the lowest level, the rest of the trenches were undisturbed below 20 cm, providing reliable artefact and charcoal samples. The materials collected were mainly of the TW tradition, with only small amounts in the uppermost levels. They included potsherds (458), five bead-grinders, 10 lumps of daub, 50 fragments of slag, 10 fragments of tuyères, 10 iron fragments and two copper sheets. Two copper beads and two recent glass beads were also collected. Other finds comprised one marine shell (*Terebralia palustris*), and bones of birds and bovid. Charcoal samples were collected from the undisturbed layers. Two were selected for analysis from trench 2, level 4, and from trench 4, level 4. The results are discussed in Chapter 10 (Table 21 and Fig. 27, Lab. Nos. Ua-2095 and Ua-2096).

A survey away from the site located some second-millennium sites half a kilometre south-west of the forest in an area, in which maize was currently being cultivated. No work was done on these sites.

### 7.5 Kiwangwa

The working trip in the 1990 season ended at Kiwangwa (6° 23’S., 38° 34’E.), 44 km to the west of Bagamoyo (Map 11). This site is about 2 km west of the present small town of Kiwangwa on the road to Masuguru (Map 11). The few people living around the site are cattle-keepers of both the Wakwere and Masai ethnic groups.

The site is surrounded by patches of bushland and large valleys with streams running to the south, west.
and north; these valleys are used for grazing. The farming land is to the east and north-east.

Unfortunately, the major part of the site has been completely destroyed by quarrying, as it is located on lateritic soil with many quartz and ferrous concretions. The quarrying activities have removed the top layer of clayish soil over a large area, in order to reach the subsurface gravel. A large number of mounds has been created, some of which may be seen in Map 18, and only one small area of 10x5 m remained untouched. Fortunately, this small area contained a concentration of cultural material providing the data presented in this work.

The first trench was dug in the undisturbed area. The stratigraphy varied from very dark-grey, compact, sandy clay to brown, compact, sandy clay at 40 cm (Fig. 7). Other trenches were excavated in the disturbed areas. The second trench was located in a piled-up mound with the purpose of recovering some of the quantities of pottery being eroded from it. A third trench was placed in the displaced, sub-surface soil piled up on an undisturbed underlayer. The purpose of the excavation was to go through the disturbed layer and to recover material from the undisturbed one.

All the material collected from this site was of the first millennium AD. Finds included potsherds (452), one bead-grinder, one fragment of glass, 95 pieces of
slag and 11 fragments of tuyère. Charcoal samples were collected from the lower levels of units 1 and 3, levels 5 and 7. The detailed results are given in Chapter 10 (Table 21 and Fig. 27, Lab. Nos. Ua-2097 and Ua-2098).

The last day of the research was used to survey the vicinity of the site. About 1 km to the north-east, a major geological feature, consisting of a steep escarpment greater than 100 m in height, extends for several kilometres from the south-west to the north-east. The floor forms a gently sloping valley, trending north-east, with a seasonal stream and forest. A survey on the lower and upper parts of the escarpment located a late Stone Age site, probably with some pottery. No work was done on this site.

Kiwangwa was another site earmarked for the Phase Two excavations. The site, which is 44 km from the shore, was found to have interesting local pottery with convincing, EIW pottery elements. It also had early glass and copper beads found on the early littoral sites. The site may help to throw light on the link between the TIW and the EIW traditions, and the littoral and hinterland relations. The undisturbed area previously identified as having a material concentration was excavated further.

A 2 x 4 m extension of the previous trench 1 was dug to the west. Digging continued down to the 70-cm level, where a sterile layer was encountered. A second 2 x 1 m trench was placed eastward of trench 3 and dug down to 70 cm below the surface. A third trench was an
Table 3. Amounts of remains collected from Misasa. Not all the upper layers had remains (trenches 1, 2 & 5).

Abbreviations: 2x = the extension of trench 2; Tr = trench, Lv = level; (a) = decorated sherds, (b) = undecorated sherds, (c) = bead grinder, (d) = tuyère, (e) = slag, (f) = iron fragments, (g) = iron hook, (h) = iron bangle, (i) = iron ring, (j) = iron key-like object, (k) = copper beads, (l) = copper bangle, (m) = imported ceramic, (n) = glass fragments, (o) = glass beads, (p) = other beads (bone, clay), (q) = shell, (r) = bone.

<table>
<thead>
<tr>
<th>Tr</th>
<th>Lv</th>
<th>abcd</th>
<th>efg</th>
<th>hi</th>
<th>jk</th>
<th>lm</th>
<th>mnopqr</th>
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<td>103</td>
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<td>218</td>
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<td>22</td>
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</tr>
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<td>5</td>
<td>22</td>
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<td>1</td>
<td></td>
<td></td>
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<tr>
<td>8</td>
<td>2</td>
<td>12</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

eastward 2 × 2 m extension of trench 1 and was excavated down to 30 cm (Map 18).

The artefacts include those found in Phase One (mentioned above). Local TIW pottery was the predominant material. Of the 3377 sherds, 571 (16.9%) were decorated. Four bead-grinders, 27 fragments of tuyère, 198 fragments of slag, 19 fragments of iron, six copper beads, six Sassanid sherds and three glass fragments were recovered. The finds on this site clearly demonstrate closer littoral–hinterland links in the middle of the first millennium AD than were previously conceived. The site has also yielded obvious transitional pottery, shedding light on the link between the TIW and the EIW tradition (Fig. 16).

Two more charcoal samples were collected for analysis. One sample from trench 1, level 4, and another from trench 2, level 6, are presented in Chapter 10 (Table 21, Lab. Nos. Ua-2599 and Ua-2598 respectively).

7.6 Misasa

The Misasa site (7° 28'S, 39° 12'W) is in the district of Kisarawe, about 85 km south of Dar-es-Salaam. It is accessible by the Dar-es-Salaam–Kilwa road, branching off to the east at Nyamironda. From Nyamironda, the road continues through Lukanga to the village of Misasa for about 6 km. A large lake, Zakwati, is found close to this village (Map 10). The road from Misasa to the coastal plain touches the southern border of the lake. Kisiju on the Indian Ocean littoral is situated
about 15 km to the north-east across the River Luhute (Rufute). The Zakwati lake, which is today an important source of fish, is 4 km long and 0.5 km at its widest part. The TIW site was located at the south-east limit, where the lake flows out during the rainy season, just 100 m from the road.

As was mentioned in Chapter 5, this part of the country is heavily wooded, being the beginning of the inland Miombo woodland. On the hill tops, the woodland is transformed into secondary rain-forest, with open grassland in the swampy valleys.

The soils of the area are sandy clay with patches of red, lateritic-clay soils occupying most of the leached hills. The swampy valley soils are used for rice cultivation, while cassava, bananas, coconuts and cashew nuts are grown on the hills.

The Misasa site was earmarked for the Phase Two research and given more attention and time (six weeks) for the following four reasons. First, it was the southernmost, hinterland TIW site known in the study area and had not been well explored. It is 12 km from the shore and is hence an interesting link between the hinterland and the littoral. Secondly, the site is located in an area known to have EIW sites, a factor thought to be crucial for investigating the possible relations between the EIW and the TIW traditions. Thirdly, it was thought worthwhile to assess the extraordinarily early, absolute dates for the TIW tradition mentioned above. Fourthly, the site was reported as large and rich.

7.6.1 Mapping and surveying

The mapping of the site was complicated by thick vegetation, comprising both forest trees and abandoned, cashew-nut trees. It was difficult and time-consuming to survey the eastern side of the lake, as it first had to be cleared. However, moving northward along a narrow path used by the inhabitants, we managed to clear 300-m-long corridors at 30 m intervals, running perpendicular to the margin of the lake across the plain. Auger and hoe pits were dug every 10 m along the corridors down to 70 cm. In the lower level, cultural material was found. A 1-km stretch of the plain was systematically surveyed in this way, and a further 1-km stretch northward was surveyed haphazardly. It was found that the southernmost part of the plain had been occupied, an area of about 4 hectares (Map 19).

The site was then mapped and, following a grid with 5-m intervals, augering was conducted to determine areas of material concentration. Areas for excavation were designated. Trenches were placed in the areas of cultural-material concentration (Map 19).

7.6.2 Excavation and finds

The whole site was covered by sandy soil. Five trenches were excavated. They were 2 x 2 m, 4 x 2 m, 2 x 2 m, 2 x 1 m, 2 x 2 m and 2 x 2 m in size. The first four trenches were dug down to 90 cm, where a sterile layer was encountered. The stratigraphy of the first four trenches (Fig. 8) indicated that the upper, 35-cm layer was of very dark-grey sand, 35 cm to 70 cm being black sand, and the rest being grey. In trench 5, a sterile layer was encountered at 50 cm, the whole deposit being black sand, except for the last 10 cm. Trench 6, dug to the eastern margin of the site, was of greyish, sandy clay.

The finds from the first five trenches were predominantly of the TIW tradition, concentrated in the black-sand layer. The upper 30-cm layer of the first four trenches and the whole of trench 6 yielded post-14th-century artefacts. It should be noted, however, that, due to post-depositional factors, a few TIW and one Sassa­mid potsherd were found on the surface and in the upper layer. The factors included charcoal-burning, cultiva-
tion and probably post-TIW-tradition, house construction (Table 3).

A total of 5788 TIW potsherds was found in trenches 1–5. One thousand, two hundred and nineteen (21%) of these were decorated (Fig. 9). Other artefacts included 28 bead-grinders (Fig. 10), 32 fragments of tuyères, 83 fragments of slag, two iron rings, four key-like objects, one hook and many miscellaneous iron objects, ranging from wire wound on a fibre core to iron knives (Fig. 11). Seventeen copper beads (Fig. 12), two copper bangles and two copper rings were also found. Other artefacts similar to those found on littoral sites (cf. Chittick 1974) were eight Sassanid sherds, seven glass and stone beads and 45 pieces of yellowish-green and colourless glass (Figs 13–14, Plates 1, 2). A few, heavily weathered, bird and fish bones, a marine shell (Terebra palustria), two pieces of coconut shell and pieces of gum arabic were also recovered. Heavily burnt lumps of red soil and lateritic stones indicated that iron ore was smelted from red, lateritic soils. Similar ore has been thought to have been utilized at the Limbo, early-iron-using site (Chami 1988b), and at Kilwa (Chittick 1974, p. 236).

(Fig. 13. Assorted beads from TIW occupational layers. a = joined copper beads (?) from Mpiji, b = tubelike copper bead (?) from Mpiji, c = three conical copper beads from Mpiji, d = draw-blown beads with gas bubbles from Mpiji, e = reddish simple wound bead from Mpiji, f = green drawn bead without gas bubbles from Mpiji, h = drawn bead red outside and white inside from Mpiji, i = carnelian sherd from Mpiji, j = shell beads from Mpiji, k = bone bead from Mpiji, m = fish bone bead from Mpiji, n = clay bead from Mpiji, o = round clay object from Mpiji. (For glass bead identification see Van der Steen 1956).
Fig. 12. Copper/bronze and lead objects from TW occupational layers.

a = copper bangle from Mpiji, b = bronze (?) ring from Misasa, c = copper ring from Misasa, d = copper chain from Mpiji, e & f = lead objects from Mpiji.
Plate 1. The first two sherds are green/blue decorated shoulders (?). The third fragment is a green/blue base sherd. The first object in the second row is a greenish flask and to the right are early alkaline green/yellowish and blue glass sherds.

Plate 2. Various types of beads found in the TIW sites. In the first row, the first two are drawn green beads, the third is a red wound bead, the fifth and sixth are drawn green and red with white inside beads, and the last is carnelian. In the second row, the second and the third are made of bone, then there are two of copper, and the last is made of clay. Below are shell beads.
Fig. 14. Sassanid objects and glass ware from Early TTW occupational layers.

a & b = Sassanid decorated shoulder sherds (Plate 1), c = a Sassanid base sherd (Plate 1), d = a bottom of a flask (Plate 1), e = rim/neck of a greenish glass bottle.
Table 4. Bones collected from Mpiji (include Crustacea).

<table>
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<tr>
<td>Neotragus moschatus</td>
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<tr>
<td>Bovid</td>
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<tr>
<td>Cercopithecus sp.</td>
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</tr>
<tr>
<td>Carnivora (cat)</td>
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<tr>
<td>Dugong</td>
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<tr>
<td>Cephalophus sp.</td>
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<tr>
<td>Ovicaprid</td>
<td>12</td>
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<tr>
<td>Suid</td>
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<td>Whale</td>
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</tr>
<tr>
<td><strong>Reptiles</strong></td>
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<tr>
<td>Crocodile</td>
<td>8</td>
</tr>
<tr>
<td>Turtle</td>
<td>365</td>
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<tr>
<td><strong>Crustacea</strong></td>
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<tr>
<td>Crab</td>
<td>42</td>
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<tr>
<td><strong>Birds</strong></td>
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</tr>
<tr>
<td>Chicken</td>
<td>1</td>
</tr>
<tr>
<td>Others</td>
<td>13</td>
</tr>
<tr>
<td><strong>Fish</strong></td>
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</tr>
<tr>
<td>Lethrinidae (changu)</td>
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<tr>
<td>Rock cod (tewa)</td>
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<tr>
<td>Sparidae (sea bean)</td>
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</tr>
<tr>
<td>Parrot fish (scarus sp.)</td>
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<tr>
<td>Inlet</td>
<td>125</td>
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<tr>
<td>Other fish (unidentified)</td>
<td>764</td>
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</tbody>
</table>

Several fragments of charcoal were recovered from each trench. Four samples weighing over 3 g were selected for C¹⁴ analysis. One was from trench 1, level 8, representing the earliest occupational layer. Two were from trench 2, levels 7 and 5 and one from trench 3, level 5. Level 5 in the first four trenches has the highest material concentration and hence indicated the period of major occupation on the site. The results of the above charcoal analyses are presented in Chapter 10 (Table 21 and Fig. 27, Lab. Nos. Ua-2593, Ua-2594, Ua-2595 and Ua-2597).

Table 5. Shells from Mpiji and Changwehela.

<table>
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<th>Species</th>
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</thead>
<tbody>
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<td>A. <strong>MPIJI</strong></td>
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</tr>
<tr>
<td>1. Telebrelia palustris L.</td>
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</tr>
<tr>
<td>2. Melongenidae (chank shells)</td>
<td>4139</td>
</tr>
<tr>
<td>3. Pleuroloca trapezium L.</td>
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<tr>
<td>4. Chioneus romorosus L.</td>
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<tr>
<td>5. Anadara antiquata L.</td>
<td>49</td>
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<tr>
<td>6. Olive shells</td>
<td>101</td>
</tr>
<tr>
<td>7. Land snail (Achatina africana)</td>
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</tr>
<tr>
<td>8. Cypraeis rofu</td>
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<tr>
<td>9. Crowdy shells</td>
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<td>10. Conus</td>
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<td>11. Lambis lambis</td>
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<tr>
<td>12. Nerita sp.</td>
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<tr>
<td>13. Mouna shell</td>
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<td>14. Donax sp.</td>
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<tr>
<td>15. Macona sp.</td>
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<tr>
<td>16. Pinctada sp.</td>
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<tr>
<td>17. Strombus sp.</td>
<td>4</td>
</tr>
<tr>
<td>B. <strong>CHANGWEHELA</strong></td>
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<tr>
<td>1. Telebrelia palustris</td>
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</tr>
<tr>
<td>2. Melongenidae (chank shells)</td>
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</tr>
<tr>
<td>3. Oysters (rocky)</td>
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8. POTTERY ANALYSIS: DECORATION AND SHAPE

8.1 Introduction

Three important aspects must be noted before we embark on this analysis. Firstly, in Chapters 6 and 7, it has been shown that pottery is by far the most frequent artefact on the TIW sites. Its type of decoration is by now the only outstanding identifier of the expansive tradition which I have called TIW in this work. The question of whether pottery can be used to identify a tradition or a cultural or ethnic group has been discussed in Chapter 2. What is essential in this chapter is the fact that from the 4th to the 10th century AD, the whole coast of East Africa and its hinterland were occupied by communities who were producing similar kinds of pottery. Whether these communities belonged to a similar ethnic group or not, the important aspect is that they had some cultural similarity or economic contact. One of the principal aims of this work has been to study the decoration, forms and paste of this pottery, in order to obtain information on its users’ origins, spread and degree of cultural and economic affiliations.

Secondly, much work has already been reported on the iron-working sites pre-dating the TIW sites on the coast (Soper 1967a; Chami 1988a, 1988b; Sinclair 1987; Morais 1988; Sinclair, Morais, Adamowicz & Duarte 1993; Cruz e Silva 1977). The pottery found at the coastal EIW sites (Kwale ware), dated to the early centuries AD, has been analysed and compared with its counterparts from the hinterland sites (Soper 1971c; Sinclair 1987; Morais 1988; Chami 1988b).

Thirdly, the main decorative motifs for Kwale ware are said to include bands of comb-stamping (Soper 1967a, pp. 5–13, Fig. 2b, c; cf. Fig. 15a:h in this work); oblique incisions (Fig. 15a:a, g); herring-bone patterns (Fig. 15a:d); horizontal incisions (Fig. 15b,j, q); cross-hatching (Soper 1967a, pp. 9, Fig. 6b); and punctates/stamps (Fig. 15b:l, r). Punctates are also used to delimit other bands (i.e. Figs 15a:f and 15b:j, n). Bevels and flutes on the rims or shoulders appear on most pots of the Kwale tradition. Otherwise, the rims are thickened. Bevels are more confined to the rims (Fig. 15a:d, f, g & h), while there are flutes to both rim and body (Figs 15a:a and 15b:i, j, p & r).

Some of the above EIW decorative elements appear in different frequencies on the TIW pottery. They include a line of punctates (Fig. 9:k, p & t), comb-stamping (Fig. 9:n, s & u), bands of cross-hatching (Fig. 9:e), horizontal and oblique incisions (Fig. 9:d, i & m; Plate 3; Fig. 16a and Table 18, design element a). Bevels, flutes and thickened rims appear frequently in the TIW tradition (Fig. 9:e, d, h & m, Fig. 16b; Plate 3).

Typical decorative elements in the TIW tradition, i.e. triangles (Fig. 9:a, o), and double lines of punctates/stamps (Fig. 9:v) have also been found in the EIW tradition in small amounts (Fig. 15a:c, e, i & r respectively). The recognition of such elements shared between the two traditions has led to the analysis of the TIW pottery as a means of discerning the cultural affinities along the coast of East Africa both diachronically and synchronically.

8.2. Analytical attributes

The analytical attributes of archaeological artefacts are different, depending on the kind of object analysed, whether stones or pottery. The attributes range over “the material artefacts made, size, shape and surface treatment” (Doran & Hodson 1975, p. 99). In pottery analysis, many aspects of the above attributes have been suggested, ranging over thickness, surface condition, weight, colour, temper, dimensions, shape, decoration, surface finish, etc. (Shepard 1963; Hulthén, 1974). Different archaeologists have, however, used different attributes in their studies, depending on the nature of their problems. In relation to cultural affinity, for instance, decorative techniques have been found to be “less informative” (Collett & Robertshaw 1983, p. 109).

Consequently, in giving a better picture of the ancient Nubian pottery and its culture, Nordström (1972) dealt with the attributes hierarchically, employing as many as he could identify. They included surface properties, technical properties, classification of the fabrics, vessel shapes and decoration. In an attempt to clarify the EIW pottery of East Africa, Soper (1971b) used an eclectic approach, by selecting 50 attributes (traits) ranging from “vessel shapes, rim morphology, bases, finish and decorative techniques and motifs” (p. 16). In trying to classify the pottery of southern Africa,
Huffman (1976, 1980) concentrated more on the structure of motif and decoration placement. In differentiating the Pastoral Neolithic pottery at the inland sites of East Africa, Collett and Robertshaw (1983) have dealt more with the decorative motifs and shape.

For this work, I have hierarchically selected four attributes: decoration, shape, and motif placement (discussed in this chapter) and fabric (discussed in Chapter 9). I have chosen these attributes for analysis below, because I am convinced that they can shed more light on the questions pertaining to the origin and spread of the TIW tradition.

8.2.2 Decoration

Different terminologies have been used in different works for decorative structures appearing on pottery. These comprise motifs (Huffman 1976, 1980; Collett & Robertshaw 1983; Soper 1971b); decorative patterns (Nordström 1972, pp. 76-7); structure of design (Kulthén 1974, p. 25); and decorative format (Sinclair 1987, p. 164). All these terms, however, seem to connote one idea, expressed by Nordström (1972, pp. 76-7) as patterns which are either impressions or incisions that can be either single or in bands or both in combination.
Hulthen (1974, p. 25) has used the term “element” to mean those independent, diagnostic patterns in a combination motif, for example, a horizontal, zigzag line and a vertical, rectilinear band filled with a rhombic, checkerboard pattern.

Recognising that many motifs in the TIW assemblage are such combinations of elements (Plate 3), the recording of various motifs went hand in hand with the isolation of elements from the combinations (Fig. 17). These elements were then subjected to proportional analysis. One aim was to study the frequency of different design elements at different sites and in different levels, in order to find out when a particular design element was introduced into the site and its distribution over the region.

A total of 42 independent design elements (Fig. 17) was identified. These comprised oblique incisions, horizontal incisions and incised or stamped triangles, regular and irregular comb-stamps, lines of punctates, lip decoration, bevels and flutes. Elements such as thickened rims, burnishing and appliqués were also included in the list.

The numbers and percentages of decorated sherds for the five TIW sites are shown in Table 6 and Fig. 18.
The Misasa site was found to have the greatest percentage of decorated sherds, followed by Masuguru, and the Kaole site had the smallest percentage of decoration. It should be noted that Misasa has early dates in the 4th to the 6th century and Kaole in the 9th century AD (Chapter 10). This could mean that the earlier the site, the greater is the percentage of decoration. The high percentage of decoration for Masuguru is probably another indication that the hinterland sites had greater amounts of decoration.

The frequencies of 42 design elements were registered and compared (Table 7). For a single line of punctate the results in Table 8 were found. It should be noted that this design element was mostly functional and was used to bound decorative motifs in a band (see Plate 3, 3rd row, last sherd). It had the same function in the EIW pottery (Fig. 15), on which it also has the highest decorative frequency (Chami 1988b).

If we put aside punctates as a design element on account of their functional purpose, triangles would be the most prominent design element, as shown in Table 9. In fact, triangles would still have the highest frequency at Kaole, even when a line of punctates is given equal weight. Masuguru being in the furthest part of the hinterland (55 km from the shore) studied, this result indicates that the triangular design may have been more popular at the hinterland sites. The same
observation was recorded for pottery from Morogoro sites about 200 km from the shore (Kimathi, personal communication). On the other hand, the highest frequency of triangles observed (at Kaole) indicates that in the late dates of TIW tradition triangles became the most dominant marker of the tradition after shedding many of the EIW pottery elements (see below).

Other outstanding design elements are lip incisions or stabs (which tend to be placed on the lip bevels), bevels, flutes and thickened rims. These are shown in Table 10. It should be noted that the last three elements above are closely associated with the EIW tradition (Figs 15 and 16). Their more frequent appearance at the sites found to have early occupational dates, for example, Misasa, and their reduction at the later sites, for example, Kaole, indicates a chronological relationship between Early TIW sites and the EIW tradition.

A few other motifs are quite common, including a band of oblique incisions (continuous or non-continuous) and double-zigzag incisions (Table 11). Oblique and double-zigzag incisions read high, next to triangles, at Kaole, indicating that, as the tradition faded away, the three design elements became dominant. The frequency of the other elements can be seen in Table 7.

In the analysis, the design elements were also divided into two categories: those thought to be more affiliated to the EIW tradition and those typical of the TIW tradition (Table 7).

The results showed that Misasa and Kiwangwa have more affiliations to the EIW tradition than the other three sites (Table 12 and Fig. 19). Indeed, several typical EIW potsherds (Fig. 16 and Plate 3) have been recovered from the two sites. Kaole shows little connection with the EIW tradition, an observation justified.
by its post-8th-century dates (Chapter 10). The indication is therefore that the earlier the site, the more EIW design elements it has. The same picture was probably obtained again when the analysis was repeated at those sites with thicker, cultural-material levels, i.e. Misasa and Mpiji. The analysis level by level indicated that the earlier the level, the greater is the number of EIW pottery elements that it has (Figs 20 and 21).

8.2.3 Shape

Several models are used for determining the shapes of pottery vessels. Nordström (1972, pp. 68-74), following Shepard (1963), developed one that recognizes two categories of restricted and unrestricted vessels, either jars (pots) or bowls. The contours of various parts of the vessels, for example, shoulder and neck, are important in determining in which category a pottery vessel should be included. This particular model has been adopted by many scholars (Hulthén 1977, p. 20; Holthoer 1977, pp. 43-55; Sinclair 1985, p. 8, and 1987, pp. 164-7; Morais 1988, pp. 63-4).

In eastern and southern Africa, students of EIW pottery have used other types of models obtained from pottery reconstruction. Soper (1971c) gives a model made up of necked pots, narrow-mouthed, globular vessels, rough, open bowls, carinated forms, and triangular handles or spouts. Similar models can be seen in Collett and Robertshaw (1983, p. 109) and Huffman (1980).

The analytical results obtained from the use of the
above two types of models, however, do not differ. In using the former model, according to Sinclair (1987, p. 165):

The categories are useful in that, even when working with severely fragmented assemblages, they provide a similar range of shapes to those mentioned by other workers in the literature, i.e. Phillipson (1977), Huffman (1974b) etc., while avoiding some of the problems resulting from working with reconstructed vessel counts.

I have adopted the former model, in order to be able to identify shapes from the fragmentary assemblages collected from the five sites.

The concept of restriction means that "the maximum diameter (major point) lies on the body, dividing the latter into two parts, the lower and the upper body. The rim diameter is always smaller than the maximum diameter..." (Nordström 1972, p. 71) (Fig. 22:a, b). Unrestriction means that "no part of the body is wider than the orifice, and the maximum diameter (major point) is measured at the rim" (Nordström 1972, p. 71; Fig. 22:d).

In the restricted-vessel category, the TIW assemblage has necked vessels with an inflected contour and vessels with a composite contour (jars) (Nordström 1972, p. 71). These are recognized in Sinclair (1985, p. 8) as independent, restricted and dependent, restricted, respectively (after Shepard 1963). Restricted bowls with a simple contour have also been identified. These types of vessels are illustrated in Fig 24i:a, b & c.

In the unrestricted-vessel category, the TIW assemblage has been found to have vessels with a simple contour (open bowls), as seen in Fig. 24ii:d) (see Nordström 1972, p. 71; Sinclair 1985, p. 8).

From the shape models (Fig. 22), therefore, seven structural-shape categories of potsherds were recognized (Sinclair 1985, p. 8; 1987, p. 165; Table 13). These categories are as follows: Category 1 could be derived from any vessel, and category 3 could be

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Fig. 17c. TIW design elements.

Fig. 18. Intersite comparison of the occurrence of decorated sherds.
Table 7. TIW design elements: EIW and typical TIW elements separated and compared.

<table>
<thead>
<tr>
<th>Elements</th>
<th>Misasa</th>
<th>Mpiji</th>
<th>Kiwangwa</th>
<th>Masuguru</th>
<th>Kaole</th>
</tr>
</thead>
<tbody>
<tr>
<td>freq</td>
<td>%</td>
<td>freq</td>
<td>%</td>
<td>freq</td>
<td>%</td>
</tr>
<tr>
<td>d</td>
<td>94</td>
<td>7.6</td>
<td>72</td>
<td>5.8</td>
<td>35</td>
</tr>
<tr>
<td>e</td>
<td>72</td>
<td>5.8</td>
<td>46</td>
<td>3.7</td>
<td>5</td>
</tr>
<tr>
<td>i</td>
<td>251</td>
<td>20.5</td>
<td>224</td>
<td>18.0</td>
<td>103</td>
</tr>
<tr>
<td>k</td>
<td>6</td>
<td>0.4</td>
<td>2</td>
<td>0.1</td>
<td>1</td>
</tr>
<tr>
<td>m</td>
<td>25</td>
<td>2.0</td>
<td>3</td>
<td>0.2</td>
<td>4</td>
</tr>
<tr>
<td>o</td>
<td>2</td>
<td>0.1</td>
<td>2</td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td>p</td>
<td>17</td>
<td>1.4</td>
<td>4</td>
<td>0.3</td>
<td>2</td>
</tr>
<tr>
<td>ee</td>
<td>80</td>
<td>6.5</td>
<td>132</td>
<td>10.6</td>
<td>34</td>
</tr>
<tr>
<td>m</td>
<td>2</td>
<td>0.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>oo</td>
<td>6</td>
<td>0.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pp</td>
<td>2</td>
<td>0.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>551</td>
<td>44.5</td>
<td>495</td>
<td>39.4</td>
<td>190</td>
</tr>
</tbody>
</table>

Table 8. Decorative frequency of a line of punctates.

<table>
<thead>
<tr>
<th>Site</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Misasa</td>
<td>20.5</td>
</tr>
<tr>
<td>Mpiji</td>
<td>18.0</td>
</tr>
<tr>
<td>Kiwangwa</td>
<td>22.5</td>
</tr>
<tr>
<td>Masuguru</td>
<td>30.2</td>
</tr>
<tr>
<td>Kaole</td>
<td>15.4</td>
</tr>
</tbody>
</table>

Table 9. Decorative frequency of triangles.

<table>
<thead>
<tr>
<th>Site</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Misasa</td>
<td>12.8</td>
</tr>
<tr>
<td>Mpiji</td>
<td>13.9</td>
</tr>
<tr>
<td>Kiwangwa</td>
<td>13.3</td>
</tr>
<tr>
<td>Masuguru</td>
<td>26.5</td>
</tr>
<tr>
<td>Kaole</td>
<td>26.9</td>
</tr>
</tbody>
</table>

derived from either independent, restricted jars or restricted bowls. Category 2 is derived from restricted jars, either dependent or independent. However, category 4 can only be derived from independent, restricted vessels, category 5 from dependent, restricted vessels, category 6 from restricted bowls and 7 from unrestricted bowls (Fig. 22).

For the purpose of comparing the frequencies of the four types of vessel, therefore, only the last four categories are important. But, for comparing jars and
Table 10. Decorative frequency of lipincisions, bevels, flutes and thickened rims.

<table>
<thead>
<tr>
<th>Site</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lip inc./st.</td>
</tr>
<tr>
<td>Misasa</td>
<td>10.1</td>
</tr>
<tr>
<td>Mpiji</td>
<td>12.7</td>
</tr>
<tr>
<td>Kiwangwa</td>
<td>4.6</td>
</tr>
<tr>
<td>Masuguru</td>
<td>1.0</td>
</tr>
<tr>
<td>Kaole</td>
<td>3.8</td>
</tr>
</tbody>
</table>

Table 11. Decorative frequency of oblique incisions and double- and single-zigzag incisions.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Misasa</td>
<td>6.2</td>
<td>4.9</td>
<td>3.6</td>
</tr>
<tr>
<td>Mpiji</td>
<td>9.9</td>
<td>3.3</td>
<td>1.4</td>
</tr>
<tr>
<td>Kiwangwa</td>
<td>11.4</td>
<td>12.0</td>
<td>3.9</td>
</tr>
<tr>
<td>Masuguru</td>
<td>11.9</td>
<td>7.2</td>
<td>4.6</td>
</tr>
<tr>
<td>Kaole</td>
<td>13.5</td>
<td>17.3</td>
<td></td>
</tr>
</tbody>
</table>
Table 12. Inter-site EIW and TIW comparison of decorated elements.

<table>
<thead>
<tr>
<th>Site</th>
<th>EIW affiliates</th>
<th>Typical TIW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Misasa</td>
<td>41.4</td>
<td>59.5</td>
</tr>
<tr>
<td>Mpiji</td>
<td>37.9</td>
<td>62.0</td>
</tr>
<tr>
<td>Kiwangwa</td>
<td>39.8</td>
<td>56.5</td>
</tr>
<tr>
<td>Musuguru</td>
<td>36.6</td>
<td>63.4</td>
</tr>
<tr>
<td>Kaole</td>
<td>19.2</td>
<td>80.8</td>
</tr>
</tbody>
</table>

Fig. 22. Pottery vessel shape models. 

Table 13. Categories used to determine pottery forms.

Abbreviations: R = rim, N = neck, SH = shoulder, BO = body and BA = base.

- Category 1: R; BO/BA; BO; BA.
- Category 2: R/N; N.
- Category 3: SH/BO/BA; SH/BO; SH.
- Category 4: R/N/SH/BO/BA; R/N/SH/BO; R/N/SH; N/SH/BO/BA; N/SH/BO; N/SH.
- Category 5: R/N/BO/BA; R/N/BO; N/BO/BA; N/BO.
- Category 6: R/SH/BO/BA; R/SH/BO; R/SH.
- Category 7: R/BO/BA; R/BO.
bowls, category 2 can be included. Category 1 is less informative, since all the types of vessels have rims, bodies and bases. As regards the TIW pottery, all the bases found are round. In the following comparative analysis, although data from all the categories are listed (Table 14), only categories 2, 4, 5, 6 and 7 have been used to compare the frequencies of pots and bowls for different sites (Table 15).

When categories 2, 4, 5, 6 and 7 in Table 15 were used to find the vessel-type frequency, the results in

![Fig. 24i. A reconstruction of vessel forms of TIW sites. a = EIW jar from Misasa, b, c & d = jars from Mpiji, Kiwangwa and Masuguru respectively.](image)

**Table 14. Number of potsherds from different vessel categories.**

<table>
<thead>
<tr>
<th>Site</th>
<th>Cat. 1</th>
<th>Cat. 2</th>
<th>Cat. 3</th>
<th>Cat. 4</th>
<th>Cat. 5</th>
<th>Cat. 6</th>
<th>Cat. 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Misasa</td>
<td>177</td>
<td>710</td>
<td>292</td>
<td>103</td>
<td>10</td>
<td>33</td>
<td>49</td>
</tr>
<tr>
<td>Mpiji</td>
<td>178</td>
<td>624</td>
<td>120</td>
<td>74</td>
<td>2</td>
<td>39</td>
<td>91</td>
</tr>
<tr>
<td>Kiwangwa</td>
<td>65</td>
<td>358</td>
<td>84</td>
<td>51</td>
<td>2</td>
<td>35</td>
<td>54</td>
</tr>
<tr>
<td>Masuguru</td>
<td>64</td>
<td>134</td>
<td>23</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>22</td>
</tr>
<tr>
<td>Kaole</td>
<td>126</td>
<td>65</td>
<td>6</td>
<td>8</td>
<td>-</td>
<td>8</td>
<td>13</td>
</tr>
</tbody>
</table>

When categories 2, 4, 5, 6 and 7 in Table 15 were used to find the vessel-type frequency, the results in

![Fig. 23 were obtained. The tendency was for the earlier sites, i.e. Misasa, to have a greater frequency of pots and the later ones, i.e. Kaole, to have a smaller frequency.

A reconstruction of the vessel forms (Fig. 24i & ii) was also made to determine the morphology of the vessels. Measurements of rim diameters and heights of TIW vessels were analysed. It became clear that ves-

**Table 15. Frequencies and percentages of pots and bowls from different sites.**

<table>
<thead>
<tr>
<th>Site</th>
<th>Pots</th>
<th>Bowls</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Freq.</td>
<td>%</td>
</tr>
<tr>
<td>Misasa</td>
<td>823</td>
<td>90.9</td>
</tr>
<tr>
<td>Mpiji</td>
<td>700</td>
<td>84.3</td>
</tr>
<tr>
<td>Kiwangwa</td>
<td>411</td>
<td>82.2</td>
</tr>
<tr>
<td>Masuguru</td>
<td>744</td>
<td>84.9</td>
</tr>
<tr>
<td>Kaole</td>
<td>73</td>
<td>77.6</td>
</tr>
</tbody>
</table>
sels with EIW pottery elements (Fig. 24i:a) tend to be more globular, the widest part of the vessel (major point) being larger than that of the rim, and the height of the vessels being greater than the major-point diameters. However, for typical TIW vessels from Mpiji, Kiwangwa, and Masuguru (Fig. 24i:b, c & d), it was very difficult on some vessels to determine whether the major point was at the rim or on the body. The vessels acquired a bag-like shape (Chittick 1974, p. 320), the neck curvature being so slight that it was difficult to observe.

The Kaole vessels represented a fading out of the TIW tradition. Necked vessels tend to be transformed into wide-open jars with the major point at the rim, and the rims being obliquely everted (Fig. 24i:a; see also Chittick 1974, p. 339, type 2 vessels). At the beginning of the Swahili tradition, probably in the 12th–13th centuries, a squat pot was introduced, which is more like a frying-pan than a pot (Fig. 24ii:d).

8.2.4 Placement of design elements

After getting some knowledge of the TIW pottery decoration and forms, it was thought to be worth making an analysis of where various design elements were placed on the vessels. The main purpose of this exercise was again to show how far the design mentalities of different communities in the TIW tradition were similar or dissimilar.

Huffman (1970, 1980) and Collett and Robertshaw (1983) have analysed the placement of decoration from reconstructed sherds. The use of the vessel categories discussed above (Fig. 22 and Table 13) has, however, been found more effective for determining the placement of decoration from even fragmentary sherds (Morais 1988, p. 119). After using a similar model to determine the shapes of the vessels, the same model is used to determine placement, as shown below.

Design elements from Misasa, Mpiji and Kiwangwa...
Table 16. Misasa, frequency of placement of design elements.

<table>
<thead>
<tr>
<th>Design elem</th>
<th>Rim</th>
<th>Neck</th>
<th>SH</th>
<th>Ind. rest.</th>
<th>Dep. rest.</th>
<th>R. bowl</th>
<th>O. bowl</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>76</td>
<td>55</td>
<td>1</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b</td>
<td>78</td>
<td>41</td>
<td>22</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c</td>
<td>94</td>
<td>72</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d</td>
<td>124</td>
<td>2</td>
<td>246</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e</td>
<td>6</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f</td>
<td>2</td>
<td>2</td>
<td>20</td>
<td>5</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>g</td>
<td>45</td>
<td>42</td>
<td>20</td>
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Table 17. Mpiji, frequency of placement of design elements.

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were subjected to this analysis. These sites, having received much more field attention, also yielded much more pottery. The design elements were recorded according to their placement on every sherd (Tables 16, 17 & 18). For design elements a, b, c, etc., see Fig. 17, and for the shape categories, see Fig. 22 and Table 13.

The general results indicate that, apart from the rim-specific elements, i.e. lip incision or stamps, bevels and rim thickening, the general tendency of the artisans of the TIW tradition was to decorate on the neck and shoulder. In fact there was a good number of design elements that fell between the neck and the shoulder. When this was clearly seen, they were recorded in category 4-independent, restricted pots. Those which did so only slightly were recorded in the category which they covered most, i.e. neck or shoulder.

It was quite interesting also to note that bowls of both categories were virtually undecorated, except for burnishing. On the other hand, burnishing was applied specifically to bowls, except for a few cases at Mpiji, where pots were burnished. And, except for a few cases at Misasa, comb-stamping was applied on restricted bowls.

It is apparent that the decorative difference between pots and bowls indicates a functional difference. It is likely that bowls, being small, would have had relatively small areas for incisions and stamps and, being used for table purposes (eating and drinking), would...
Table 18. Kiwangwa, frequency of placement of design elements.

Abbreviations: SH = shoulder, Ind. rest. = independent restricted, Dep. rest. = dependent restricted, R. bowl = restricted bowl, O. bowl = open bowl.

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</tbody>
</table>

look more beautiful when burnished and were possibly easier to wash. With the knowledge derived from beautiful, imported plates and bowls, burnishing would probably have been used to compensate for the glazing technique. At the same time, island settlements, i.e., Kilwa and the Comoros, were red-slipping their bowls (Chittick 1974; Wright 1984).

8.3 Conclusion

The extreme differences observed between the Misasa and the Kaole sites in both decoration and vessel forms indicate a chronological difference, the former offering a link with the earlier EIW tradition in the 4th and the 5th centuries AD, when pots were more globular and decorated (Chami 1988b), and the latter indicating the fading away of the TIW tradition, when the vessels were less decorated and less globular (Fig. 24; Chittick 1974, p. 320). Ceramic finds from the remaining sites of Mpiji, Kiwangwa and Masuguru seem to be correlated with each other, indicating the period when the TIW tradition was at its peak in the 7th century. However, they seem to have much in common with the earlier site of Misasa in terms of the EIW pottery elements and imported materials. The chronological aspects are discussed in detail in Chapter 11.
9. POTTERY ANALYSIS: FABRIC

The purpose of analysing the pottery fabric was to obtain more information on the type of clay and temper used, in order to assess the problem of the pottery trade discussed in Chapter 2. Some elements of decoration and pottery quality have been used below to supplement the fabric studies in understanding the problem.

The most advanced methods of investigating pottery paste are petrographic microscopy and thermal analysis. These have been discussed in detail in Hulthen (1977, pp. 20-1) and Lindahl (1986, pp. 28-31). In eastern Africa, pottery from Mozambique and Zimbabwe have been subjected to such analyses (Hulthen 1988). Similar methods have been applied to pottery from the five sites discussed in this work, together with data from the Limbo EIW site reported elsewhere (Charni 1988b, 1992b). The results are reported by Lindahl in section 9.2.

9.1 Initial field and laboratory observations

Some few observations were made initially in the field and later in the laboratory, before submitting a few samples for petrographic studies. A magnifying glass was used for laboratory observation. This method was necessitated by the fact that, as we moved from one site to another, the pottery fabric seemed to portray different features and qualities.

9.1.1 Paste

Misasa, Mpiji, and Kaole sherds were found to have been tempered with very fine sand. In the pottery from Kaole and Mpiji, the sand is of a glittering type, which may be beach sand. A few sherds from Kaole and Mpiji were also decorated with shells (design element z in Fig. 17; cf. Fig. 25), a confirmation that they were probably produced close to the shore.

The two interior sites of Kiwangwa and Masuguru offered an even better understanding of the source of the paste material. Kiwangwa, for instance, is situated in an area rich in coarse buff quartz, most of it attached to lumps of red, lateritic gravel (iron concentration). Whitish stones associated in the gravel have been identified by Dr. Anders Lindahl as felspar. The paste of the Kiwangwa pottery has all the rock components of gravel, including lateritic concretions and felspar. Some of the tempering material was so coarse that, falling out of the sherds, it leaves holes which can sometimes be confused with decorative stamps.

On the other hand, in some parts of Masuguru, the soils have deposits of coarse buff quartz in association with chunks of black and dark-grey, shining, graphitic particles. Large pieces of graphitic stones were also recovered from the archaeological contexts, indicating a common use of the mineral and hence a possible source of the burnishing graphite. The paste of the pottery from this site has all the above components, including particles of graphite.

9.1.2 The quality of the sherds

The quality and strength of the sherds were also examined. Some sherds from Mpiji and Misasa were produced from fine clay and were so well fired that their hardness is half that of porcelain. They amount to about 10% of all sherds in Misasa and 8% in Mpiji. This type of highly fired and hardened pottery was not found in Kiwangwa, Masuguru, and Kaole, indicating that it was a local technological innovation in some areas of the coast. The fact that the decoration and forms of the pottery are of the TIW tradition argues against the idea that they were imported.

From the preliminary analysis, it was concluded that, in most cases, the TIW pottery at different sites was produced locally. The paste of the pottery from the four sites showed local particulation, which strongly supports the idea of local manufacture. To check on this hypothesis, several sherds from different sites were submitted for petrological analysis. In the following section, Dr. Anders Lindahl presents the result.

9.2 Microscopic analyses (by Anders Lindahl)

9.2.1 Introduction and formulated problems

The laboratory analyses of the sherd material have been carried out at the Laboratory for Ceramic Research, Department of Quaternary Geology, University of Lund, Sweden. The aim of these laboratory...
analyses is to study the use of the raw material and to elucidate variations in the craft tradition. In this way it is possible to present solutions to the archaeological problems that would otherwise be difficult to find.

The raw material (clay, temper, etc.) is the basis for the ceramic production. Even though the study of vessel shape and decoration constitutes an important part of the ceramic investigation, shape and decoration most often reflect ideas and fashions of certain periods and may be very easily copied over long distances. In general, the raw material tends to have a much more limited range of distribution. There are, of course, exceptions and they usually stand out in a close study of the pottery material.

The questions to which the laboratory investigation will help to find answers are as follows:

(1) Is it possible to trace local manufacture and imported vessels in the raw material?

(2) Is it possible to make suggestions about which vessels originated at the same site?

(3) Is it possible to determine which vessels are contemporary?

9.2.2 Material

The material comprises 26 sherds from the six sites (Table 19). Five sherds from Misasa (sample Nos 1, 2, 3 and 5) are dated to the 7th century AD, sample No. 4 is dated to the 4th century AD, 3 sherds from Limbo (sample Nos 6–7) are dated to the 5th century AD, 4 sherds from Kaole (sample Nos 9–12) are dated to the 9th century AD, 5 sherds from Masuguru (sample Nos 18–22) are dated to the 7th century AD and 4 sherds from Mpiji (sample Nos 23–26) are dated to the 7th century AD.

9.2.3 Method

In order to provide answers to the above questions, a number of unambiguous studies and calculations have been made. Each individual study reflects a specific part of the ceramic process and only the combined analysis results will give a more complete picture of the ancient craft and its products.

In this investigation, the analysis is concentrated on petrographic microscopy. Petrographic microscopy is carried out on thin sections of pottery, i.e. a piece of a sherd which has been ground to a uniform thickness of 30 µm. The thin section is analysed under a polarizing microscope in magnifications ranging from 25x to 1000x. This analysis makes it possible to identify different minerals within the silt and sand fractions. Furthermore, remnants of organic matter, diatoms, accessory minerals and other impurities of the clay are studied.

The measurements and calculations performed on the coarser fractions of the ware are (1) the maximum grain size (max. grain size), (2) the mean value of the five largest grains in the sample (mean max. grain size), (3) estimate of the amount of coarse fractions (grains larger than 0.1 mm), and (4) measurement of the length axes of 100 grains, following a fixed line across.

Particular observations of specific minerals, and other features concerning the temper and the clay, have been noted.

Microscopic colour photographs of the thin sections provided a means of dividing a large number of thin sections into groups (MIPHO groups) by visual classification, for example, a group of clays with a similar appearance. At least two photographs from different
Table 19. Description of sherds analysed petrologically.
Abbreviations: Tr = trench; Th = thickness; Wt = weight; Dec = decoration (for decoration abbreviation see Fig. 17).

<table>
<thead>
<tr>
<th>Sample</th>
<th>Site</th>
<th>Tr (lev)</th>
<th>Th (mm)</th>
<th>Wt (gm)</th>
<th>Dec.</th>
<th>Sherd type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Misasa</td>
<td>1 (6)</td>
<td>15</td>
<td>25.7</td>
<td>obl. inc.</td>
<td>neck</td>
</tr>
<tr>
<td>2</td>
<td>Misasa</td>
<td>1 (5)</td>
<td>12.7</td>
<td>31.3</td>
<td>plain</td>
<td>rim</td>
</tr>
<tr>
<td>3</td>
<td>Misasa</td>
<td>2 (5)</td>
<td>12.5</td>
<td>18.5</td>
<td>hor. hatch.</td>
<td>neck</td>
</tr>
<tr>
<td>4</td>
<td>Misasa</td>
<td>1 (7)</td>
<td>12.0</td>
<td>24.3</td>
<td>cr. hatch.</td>
<td>neck</td>
</tr>
<tr>
<td>5</td>
<td>Misasa</td>
<td>2 (6)</td>
<td>11.0</td>
<td>24.3</td>
<td>obl. hatch</td>
<td>neck</td>
</tr>
<tr>
<td>6</td>
<td>Linbo</td>
<td>4 (12)</td>
<td>9.0</td>
<td>13.7</td>
<td>bevelled</td>
<td>neck</td>
</tr>
<tr>
<td>7</td>
<td>Linbo</td>
<td>4 (13)</td>
<td>10.0</td>
<td>16.2</td>
<td>bevelled</td>
<td>neck</td>
</tr>
<tr>
<td>8</td>
<td>Linbo</td>
<td>3 (13)</td>
<td>9.0</td>
<td>22.3</td>
<td>hor. inc.</td>
<td>shoulder</td>
</tr>
<tr>
<td>9</td>
<td>Kaole</td>
<td>1 (8)</td>
<td>9.0</td>
<td>46.7</td>
<td>triangle</td>
<td>neck</td>
</tr>
<tr>
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<td>3 (8)</td>
<td>9.0</td>
<td>26.3</td>
<td>plain</td>
<td>rim/body</td>
</tr>
<tr>
<td>11</td>
<td>Kaole</td>
<td>1 (8)</td>
<td>9.0</td>
<td>11.6</td>
<td>cr. hatch.</td>
<td>neck</td>
</tr>
<tr>
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<td>Kaole</td>
<td>1 (8)</td>
<td>12.0</td>
<td>48.0</td>
<td>grooves</td>
<td>body/rim</td>
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<td>Kiwangwa</td>
<td>1 (5)</td>
<td>11.0</td>
<td>20.5</td>
<td>triangle</td>
<td>neck</td>
</tr>
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<td>14</td>
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<td>9.0</td>
<td>13.0</td>
<td>hor. hatch.</td>
<td>neck/shoulder</td>
</tr>
<tr>
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<td>Kiwangwa</td>
<td>1 (5)</td>
<td>11.0</td>
<td>51.2</td>
<td>triangle</td>
<td>neck</td>
</tr>
<tr>
<td>16</td>
<td>Kiwangwa</td>
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<td>19.8</td>
<td>plain</td>
<td>rim/body</td>
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<tr>
<td>17</td>
<td>Kiwangwa</td>
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<td>10.0</td>
<td>11.2</td>
<td>plain</td>
<td>rim/body</td>
</tr>
<tr>
<td>18</td>
<td>Masaguru</td>
<td>3 (4)</td>
<td>12.0</td>
<td>14.2</td>
<td>triangle</td>
<td>shoulder</td>
</tr>
<tr>
<td>19</td>
<td>Masaguru</td>
<td>3 (4)</td>
<td>13.0</td>
<td>44.8</td>
<td>obl. zigz</td>
<td>shoulder</td>
</tr>
<tr>
<td>20</td>
<td>Masaguru</td>
<td>4 (4)</td>
<td>11.0</td>
<td>37.4</td>
<td>triangle</td>
<td>neck</td>
</tr>
<tr>
<td>21</td>
<td>Masaguru</td>
<td>4 (4)</td>
<td>12.0</td>
<td>12.0</td>
<td>plain</td>
<td>rim/body</td>
</tr>
<tr>
<td>22</td>
<td>Masaguru</td>
<td>3 (4)</td>
<td>11.0</td>
<td>12.4</td>
<td>plain</td>
<td>rim/body</td>
</tr>
<tr>
<td>23</td>
<td>Mpiji</td>
<td>1 (6)</td>
<td>9.0</td>
<td>19.0</td>
<td>dob. zigz</td>
<td>neck</td>
</tr>
<tr>
<td>24</td>
<td>Mpiji</td>
<td>1 (6)</td>
<td>9.0</td>
<td>41.2</td>
<td>triangle</td>
<td>neck</td>
</tr>
<tr>
<td>25</td>
<td>Mpiji</td>
<td>1 (7)</td>
<td>9.0</td>
<td>51.1</td>
<td>triangle/rim</td>
<td>neck</td>
</tr>
<tr>
<td>26</td>
<td>Mpiji</td>
<td>1 (6)</td>
<td>10.0</td>
<td>81.7</td>
<td>plain</td>
<td>rim/body</td>
</tr>
</tbody>
</table>

parts of the thin section were taken, in order to minimize erroneous groupings due to local variations (Lindahl 1986, p. 29).

9.2.4 Results

All the clays are ferruginous and free of calcium carbonates. No organic matter or diatoms were observed in any of the samples.

Sample 1 (Fig. 26a). MIPHO group I, a fine clay with an admixture—most likely a deliberately added temper—of coarse silt and sand. The max. grain size is 1.6 mm and the mean max. grain size is estimated as 1.3 mm. The amount of coarse fractions (grains larger than 0.1 mm) has been estimated as 13%. The mineral content is basically quartz, with very few grains of amphiboles and pyroxenes. In addition to the sand temper, the ware has also been tempered with chamotte. Some grains show traits of being sintered. Few and small grains of ore material occur.

Sample 2 (Fig. 26a). MIPHO group I, a fine dense clay with an admixture—most likely a deliberately added temper—of coarse silt and sand. The max. grain size is 2.0 mm and the mean max. grain size is calculated as 1.3 mm. The amount of coarse fractions has been estimated as 17%. The mineral content is mainly quartz; very few grains of amphiboles and pyroxenes have been observed. The ware has also been tempered with chamotte. Apart from two large grains, the ore material consists of very small grains sparsely scattered in the ware.

Sample 3 (Fig. 26b). MIPHO group II, a medium-to-coarse, silty clay with a minor amount of very fine sand. The max. grain size is 1.9 mm and the mean max. grain size is calculated as 1.2 mm. The amount of coarse fractions has been estimated as 10%. The mineral content consists mainly of quartz, a small amount of feldspar and a few grains of mica. Furthermore, there is a rich representation of ferrhydrite in the ware. The grains of ore material are few and very small.

Sample 4 (Fig. 26c). MIPHO group I, a fine, dense clay with very sparse contents of silt and sand. The max. grain size is 1.1 mm and the mean max. grain size is calculated as 1.0 mm. The amount of coarse fractions has been estimated as 7%. The mineral content consists mainly of quartz and very few amphiboles and pyroxenes. The ware has been tempered with chamotte, of which some grains are sintered. Very few and small grains of ore material occur.

Sample 5 (Fig. 26a). MIPHO group I, a fine clay with an admixture—most likely a deliberately added temper—of coarse silt and sand. The max. grain size is 1.3
mm and the mean max. grain size is calculated as 1.0 mm. The amount of coarse fractions has been estimated as 13%. The mineral content consists mainly of quartz and very few amphiboles and pyroxenes are observed. The ware has been tempered with chamotte, of which some grains are sintered. Very few and small grains of ore material occur.

Sample 6 (Fig. 26d). MIPHO group III, an unsorted, somewhat silty and sandy clay. The max. grain size is 2.1 mm and the mean max. grain size is calculated as 1.3 mm. The amount of coarse fractions has been estimated as 14%. The mineral content is basically quartz and a smaller proportion of feldspar, as well as a few small grains of amphiboles and pyroxenes. A small number of concentrations of ferricydrite and clay pellets are scattered in the ware. The ware comprises a relatively large amount of ore material in grain sizes from 0.03 to 0.3 mm.

Sample 7 (Fig. 26d). MIPHO group III, an unsorted, somewhat silty and sandy clay. The max. grain size is...
1.7 mm and the mean max. grain size is calculated as 1.2 mm. The amount of coarse fractions has been estimated as 14%. The mineral content is basically quartz and a smaller proportion of feldspar, as well as a few small grains of amphiboles and pyroxenes. A small number of concentrations of ferrihydrite and clay pellets are scattered in the ware. The ware comprises a relatively large amount of ore material in grain sizes from 0.03 to 0.3 mm. The clay is partly sintered.

Sample 8 (Fig. 26d). MIPHO group III, an unsorted, somewhat silty and sandy clay. The max. grain size is 1.9 mm and the mean max. grain size is calculated as 1.4 mm. The amount of coarse fractions has been estimated as 18%. The mineral content is basically quartz and a smaller proportion of feldspar, as well as a few small grains of amphiboles and pyroxenes. A small number of concentrations of ferrihydrite and clay pellets are scattered in the ware. The ware comprises a relatively large amount of ore material in grain sizes from 0.03 to 0.3 mm. The clay is partly sintered.

Sample 9 (Fig. 26e). MIPHO group IV, an unsorted, silty and sandy clay. The content of silt is larger and the grains are also coarser than those in samples 6–8. The max. grain size is 1.8 mm and the mean max. grain size is calculated as 1.1 mm. The amount of coarse fractions has been estimated as 16%. The mineral content consists mainly of quartz, as well as a small amount of feldspar and a few grains of amphiboles and pyroxenes. Some grains of feldspar show traces of weathering. The amount of ore material is somewhat greater than in samples 6–8 and the grains are also coarser. The grain-size variation is between 0.06 and 0.3 mm. The ware also includes small concentrations of ferrihydrite.

Sample 10 (Fig. 26f). A sorted, coarse-silty and very fine, sandy clay, in which the majority of the grains sizes fall within the range 0.03–0.2 mm. The max. grain size is 0.9 mm and the mean max. grain size is calculated as 0.6 mm. The amount of coarse fractions has been estimated as 6%. The mineral composition consists mainly of quartz and a small amount of feldspar. The grains of amphiboles and pyroxenes are more frequent than in samples 1–9. The ware is also relatively rich in ore material and in small concentrations of ferrihydrite.

Sample 11 (Fig. 26g). MIPHO group IV, an unsorted, silty and sandy clay. The content of silt is larger and the grains are also coarser than in samples 6–8. The max. grain size is 1.3 mm and the mean max. grain size is calculated as 0.9 mm. The amount of coarse fractions has been estimated as 11%. The mineral content consists mainly of quartz, as well as a small amount of feldspar and a few grains of amphiboles and pyroxenes; some grains of feldspar show traces of weathering. The amount of ore material is somewhat greater than in samples 6–8 and the grains are also coarser. The grain-size variation is between 0.06 and 0.3 mm. The ware also includes small concentrations of ferrihydrite.

Sample 12 (Fig. 26b). MIPHO group II, a sorted, medium-to-coarse-silty clay with a minor amount of very fine sand. The max. grain size is 1.4 mm and the mean max. grain size is calculated as 1.0 mm. The amount of coarse fractions has been estimated as 9%. The mineral content consists mainly of quartz, a small amount of feldspar and a few grains of amphiboles, pyroxenes and mica. Furthermore, there is an abundant representation of ferrihydrite-rich grains (less than 0.45 mm) in the ware. The grains of ore material are few and very small.

Sample 13 (Fig. 26g). An unsorted clay with the majority of grains within the coarse-silt fractions. The max. grain size is 1.7 mm and the mean max. grain size is calculated as 1.2 mm. The amount of coarse fractions has been estimated as 17%. The mineral content consists mainly of quartz and a small amount of feldspar with a few weathered grains. A few small grains of amphiboles and pyroxenes, and a very few grains of ore material, occur.

Sample 14 (Fig. 26h). MIPHO group V, a sorted, medium-silty to very fine clay with a sparse content of coarser sand. The amount of silt is larger than in samples 6–8. The max. grain size is 2.3 mm and the mean max. grain size is calculated as 1.9 mm. The amount of coarse fractions has been estimated as 17%. The mineral content consists mainly of quartz and a small amount of feldspar. Grains of amphiboles, pyroxenes and mica are more frequent than in samples 1–13. The clay also contains ferrihydrite and clay pellets of varying sizes. Few grains of ore material have been observed. Part of the clay, as well as a few clay pellets, have begun to sinter towards the outside of the vessel wall.

Sample 15 (Fig. 26h). MIPHO group V, a sorted, medium-silty clay with a sparse content of coarser sand. The amount of silt is larger than in samples 6–8. The max. grain size is 2.1 mm and the mean max. grain size is calculated as 1.4 mm. The amount of coarse fractions has been estimated as 14%. The mineral content consists of quartz and a small amount of feldspar. Grains of amphiboles, pyroxenes and mica are more frequent than in samples 1–13. The clay also contains concentrations of ferrihydrite and clay pellets of varying sizes. A few grains of ore material occur. Part of the clay, as well as a few clay pellets, have begun to sinter towards the outside of the vessel wall.

Sample 16 (Fig. 26h). MIPHO group V, a sorted, medium-silty to very fine clay with practically no content of coarser sand. The amount of silt is larger than in samples 6–8. The max. grain size is 0.8 mm and the
Table 20. Fabric grain-size measurements.

<table>
<thead>
<tr>
<th>Sample</th>
<th>Max. grain size</th>
<th>Mean grain size</th>
<th>Greater than 0.1 mm (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1.67</td>
<td>1.31</td>
<td>13</td>
</tr>
<tr>
<td>2.</td>
<td>1.96</td>
<td>1.28</td>
<td>13</td>
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<td>3.</td>
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<td>1.19</td>
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<tr>
<td>4.</td>
<td>1.07</td>
<td>1.01</td>
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<tr>
<td>5.</td>
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<td>1.04</td>
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<td>1.21</td>
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<td>1.42</td>
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<tr>
<td>9.</td>
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<td>1.11</td>
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<tr>
<td>10.</td>
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<td>11</td>
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<td>1.36</td>
<td>1.02</td>
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<tr>
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<td>1.21</td>
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<tr>
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<td>5</td>
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<td>19.</td>
<td>2.97</td>
<td>1.47</td>
<td>18</td>
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<tr>
<td>20.</td>
<td>2.71</td>
<td>1.71</td>
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<tr>
<td>21.</td>
<td>2.79</td>
<td>2.00</td>
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<tr>
<td>22.</td>
<td>1.81</td>
<td>1.35</td>
<td>17</td>
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<tr>
<td>23.</td>
<td>2.31</td>
<td>1.12</td>
<td>12</td>
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<tr>
<td>24.</td>
<td>1.54</td>
<td>1.17</td>
<td>14</td>
</tr>
<tr>
<td>25.</td>
<td>1.50</td>
<td>1.06</td>
<td>12</td>
</tr>
<tr>
<td>26.</td>
<td>1.31</td>
<td>1.24</td>
<td>13</td>
</tr>
</tbody>
</table>

mean max. grain size is calculated as 0.8 mm. The amount of coarse fractions has been estimated as 5%. The mineral content consists of quartz and a smaller proportion of feldspar. Grains of amphiboles, pyroxenes and mica are more frequent than in samples 1–13. The clay also contains ferrihydrite and clay pellets of varying sizes. Few grains of ore material.

Sample 17 (Fig. 26i). MIPHO group VI, an unsorted, sandy clay. The max. grain size is 2.6 mm and the mean max. grain size is calculated as 1.7 mm. The amount of coarse fractions has been estimated as 21%. The mineral composition consists of quartz and partly weathered feldspar, as well as a few grains of amphiboles and pyroxenes. To be noted are the grains of a not yet identified mineral. There are also a few grains of clay pellets. The ore material is sparse and basically within the coarse silt/fine sand fraction.

Sample 18–20, 22 (Fig. 26j). MIPHO group VII, a coarse, unsorted, silty and sandy clay. The max. grain size ranges from 2.7 to 3.5 mm. The mean max. grain size is calculated as 1.5 mm. The amount of coarse fractions has been estimated as 18%. Large, composite grains of quartz and feldspar occur, as well as of sintered quartz and feldspar grains. The feldspar is greatly weathered. Amphiboles, pyroxenes and mica occur more frequently, compared with all the other samples. The clay is comparatively rich in ore material, most of which is within a grain-size range of 0.1–0.3

Sample 21 (Fig. 26i). MIPHO group VI, an unsorted, sandy clay. The max. grain size is 2.8 mm and the mean max. grain size is calculated as 2.2 mm. The amount of coarse fractions has been estimated as 21%. The mineral composition consists of quartz and partly weathered feldspar, as well as a few grains of amphiboles and pyroxenes. To be noted are the grains of a not yet identified mineral. There are also a few grains of clay pellets. The ore material is sparse and basically within the coarse silt/fine sand fraction.

Sample 23–26 (Fig. 26k). MIPHO group VII, a sorted, silty clay with a small content of coarse, silty sand. The max. grain size is 2.0 mm and the mean max. grain size is calculated as 1.1 mm. The amount of coarse fraction has been estimated as 12%. The mineral composition consists largely of quartz and feldspar, as well as a few grains of amphiboles and pyroxenes. The clay is comparatively rich in ore material, in which a grain size between 0.08 and 0.25 mm predominates.

A summary of the grain-size analysis is provided in Table 20.

9.2.5 Conclusions

The investigated material from Misasa, Limbo, Kiale, Kiwangwa, Masuguru and Mpiji consists of very distinctive ware-groups, which to a large extent are related to the different sites.

The Misasa site has three different types of ware. The predominant type is made of a very fine clay, to which a temper of quartz and chamotte has been added (sherds Nos 1, 2 and 5; Fig. 26a). The vessels manufactured in this fashion are dated to the 7th century AD. However, one of the test sherds (No. 4), which is dated to the 4th century, is made out of the same fine clay as the three others but it is only tempered with chamotte (Fig. 26c). This may imply that chamotte temper belongs to an older tradition of manufacturing techniques that lived on even when the tradition of vessel production had changed into the use of crushed quartz as the dominant type of temper.

The fifth sample (No. 3) consists of a much coarser clay, which has no resemblance to the others (Fig. 26b). The larger amount of silt, the presence of mica and the concentrations of ferrihydrite make this ware different and clearly points to a different source for the clay. The ware has its closest parallel in one sherd from Kaole (No. 12).

The samples from the Limbo site (Nos 6–8) are all very similar to one another. The clay has a relatively fine matrix, which has a natural temper of coarse silt and sand. They all display the same composition of ore material, ferrihydrites and clay pellets that makes them
unique, compared with sherds from the other sites (Fig. 26d).

The Kaole site has a more varied composition of pottery ware. Two sherds (Nos 9 & 11), however, have a similarity in clay type and mineral content that strongly indicates that they were manufactured in the same tradition and of clay from the same source (Fig. 26e). The vessel represented by sample No. 10 has been made of a sorted, very coarse, ferruginous clay that is unique among the investigated sherds (Fig. 26f). As mentioned above, sample No. 12 has a similar clay composition to sample No. 3 from Misasa (Fig. 26b). There are slight differences in the mineral compositions of these two samples. However, this difference is not greater than the normal variation within the same clay deposit.

The material from the Kiwangwa site shows the same pattern as Kaole: a nucleus of vessels with the same ware composition (sample Nos 14, 15 & 16) (Fig. 26h), one unique sherd (sample No. 13) (Fig. 26g), and one sherd (No. 17) which can be related to a material from another site (No. 12 from Masuguru) (Fig. 26i).

The majority of the vessels have been manufactured from a medium-silty to fine sandy clay containing quartz and some feldspar, mica, amphiboles and pyroxenes. The clay also includes a fair amount of clay pellets and concentrations of ferrihydrite. The ware of sample No. 16 almost completely lacks grains of the sandy fraction. A possible explanation is that the clay was dug at a different level of the clay deposit, compared with the clay used to make the other two vessels.

The ware of sample No. 13 has a very uniform grain size, with the coarse silt to fine sandy fractions, which largely consist of quartz and a small amount of feldspar. This type of ware has not been identified among the sherds from the other sites.

The ware of sample No. 17 has a very fine matrix, mixed with an unsorted, coarse fraction of sand. In the mineral composition, heavily deformed grains of a very strong, brown colour (PPL) have been observed. It has not yet been possible to ascertain what type of mineral this is.

The Masuguru site has a more uniform inventory of vessels as far as the composition of the clay is concerned. Four of the five sherds (Nos 18, 19, 20 & 22) have an almost identical ware (Fig. 26j). The coarse, unsorted, silty and sandy clay contains several large composite grains of quartz and feldspar, as well as a large amount of heavily weathered feldspar, mica, amphiboles, pyroxenes and ore material. There is very little doubt that all these vessels have been formed of clay from the same deposit.

The ware of sherd No. 21 has an almost identical composition to that of sherd No. 17 from Kiwangwa (Fig. 26i).

All the vessels from the Mpiji site (sample Nos 23–26) have a raw-material composition that is practically identical (Fig. 26k). The sorted clay is rich in grains of quartz and feldspar, as well as grains of ore material. It is therefore most likely that they were all made of clay from the same source.

As regards answering the questions put forward in the introduction, this pilot investigation strongly indicates that the majority of the vessels within a site show a similar or almost identical composition of the clay and that there are great differences among the sites. The results may therefore, with the greatest certainty, be interpreted as meaning that the pottery at each individual site was made predominantly from raw material collected from only one clay deposit. In the cases of Limbo and Mpiji, the results do not display any external influence on the pottery. At the other sites, sherds of other origins have been observed only in a few cases. Misasa and Masuguru, for instance, have only one sherd each that can be related to an external origin. Kaole and Kiwangwa display a more complex inventory. The majority of the vessels are of local origin. One sherd at each site is unique among the investigated vessel sherds.

It is difficult to determine which vessels are contemporary, on the basis of these laboratory analyses. The difference between sample No. 4 and samples Nos 1, 2 and 5, however, suggests a change of the handicraft at one site over a period of 300 years.

In short, the locally produced pottery—at the village or town level—to a very large extent outnumbers the imported wares.
10. CHRONOLOGY

To be able to review properly the theories of the origin and spread of the early and later iron-working communities along the coast of East Africa, the chronological aspects must be discussed thoroughly. These comprise the stratigraphical ordering of the material, the stratigraphical association of imported and local artefacts for relative dating, and the absolute dating by carbon-14 samples from different cultural layers.

Relative dating has been the main dating technique used with certainty on the coast of East Africa. The Chinese and Islamic ceramics found in archaeological contexts on the East African coastal sites have generally been used as the objects of such dating technique (Chittick 1974, p. 319; Horton 1987b, p. 294). This approach has been said to agree with the occasional coin finds, the radiocarbon dates, the excavation of kilns and the investigation of occupation in China and the Near East. On this criterion, occupation in the Lamu Archipelago has been dated from the eighth century onwards, "probably from about A.D. 750" (Horton 1987b, p. 294).

The certainty attributed to this method without challenge may, however, have led many archaeologists astray. Many radiocarbon dates were thrown away, because they did not match the dates obtained from the relative dating (Chami 1992a). It is now even appearing that the justification for using imported ceramics to date settlements on the coast of East Africa was not well founded. It has been shown that "neither is there much dating evidence from excavated Islamic and Chinese kiln-sites" (Tampoe 1989, p. 69).

The use of the relative-dating method in this work has been carefully checked with both the existing dates of the local sequences and the new radiocarbon results.

It was mentioned above that one of the reasons for neglecting radiocarbon dates was that most of them did not fit the agreed relative dating in the 9th–10th centuries AD. However, another reason was based on the idea that dates obtained from materials associated with the waters of the Indian Ocean, i.e. shells and charcoal from mangrove wood, would be 440 years older than the real age. The reason for this is attributed to the "natural variations in atmospheric carbon-14" and the "carbon-14 content of Indian Ocean water" (Wright 1984, pp. 54–5). It was also thought that the charcoal samples could be from the inner rings of a tree laid down for a long time before it was burnt. This would also offer an age 400 years older than the normal (Wright 1984, pp. 54–5).

The use of 18 radiocarbon dates in this work has been checked by taking into account the fact that they were collected from different sites, including those in the hinterland, which have nothing to do with marine water. Small chunks of charcoal collected from different levels and units of different sites make it unlikely that all would have come from the trunk of one tree.

10.1 Stratigraphy

It has been shown in Chapter 7 that, apart from the Kaole site, the other TIW sites under study belonged to one major period of occupation. For instance, although the sites of Misasa, Mpiji and Masuguru had indications of post-TIW occupations in the vicinity, the latter is not a direct, cultural continuation of the former. I have, however, noted that, prior to the TIW occupation in Misasa, there existed an EIW tradition in the vicinity, of which the cultural traits might have been carried forward in the pottery of the TIW tradition. It has been shown in the previous chapter that some EIW pottery sherds have been identified in the context of early TIW occupations in Misasa, Mpiji and Kiwangwa. This has led to the conclusion that the TIW sites were chronologically later than the EIW tradition.

The study in Kaole has also shown that a less-decorated and ultimately a plain-ware tradition marked the final phase of the TIW tradition. Therefore, a stratigraphic sequence of artefacts from the five sites studied in this work should begin with the EIW tradition at the bottom, followed by the TIW tradition and then the plain-ware tradition.

10.2 Relative dating

Pottery with EIW elements has been found in the lower layers at Misasa, Kiwangwa and Masuguru. As was also observed (see Figs 20 and 21), these elements decreased in the upper layers. Since the EIW tradition on the coast has been dated between the 1st century BC
Table 21. C14-results from six sites (calibration according to Stuiver & Becker 1986).

<table>
<thead>
<tr>
<th>Lab. no.</th>
<th>Site</th>
<th>Trench</th>
<th>Level</th>
<th>Radiocarbon Age BP One sigma (cal.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ua-2593</td>
<td>Misasa</td>
<td>1</td>
<td>8</td>
<td>1975+/-50 BC 89 (25, 43, 46) AD 68</td>
</tr>
<tr>
<td>Ua-2594</td>
<td>Misasa</td>
<td>2</td>
<td>7</td>
<td>1725+/-45 AD 239 (261, 279, 293, 297, 335) 385</td>
</tr>
<tr>
<td>Ua-2595</td>
<td>Misasa</td>
<td>2</td>
<td>5</td>
<td>1295+/-25 AD 659 (685) 775</td>
</tr>
<tr>
<td>Ua-2597</td>
<td>Misasa</td>
<td>3</td>
<td>5</td>
<td>1485+/-50 AD 536 (575) 639</td>
</tr>
<tr>
<td>Ua-2592</td>
<td>Mpiji</td>
<td>4</td>
<td>8</td>
<td>1340+/-60 AD 642 (665) 765</td>
</tr>
<tr>
<td>Ua-2087</td>
<td>Mpiji</td>
<td>1</td>
<td>6</td>
<td>1420+/-60 AD 576 (640) 638</td>
</tr>
<tr>
<td>Ua-2088</td>
<td>Mpiji</td>
<td>1</td>
<td>6</td>
<td>1390+/-80 AD 582 (644) 678</td>
</tr>
<tr>
<td>Ua-2598</td>
<td>Kiwangwa</td>
<td>2</td>
<td>6</td>
<td>1405+/-55 AD 599 (642) 662</td>
</tr>
<tr>
<td>Ua-2599</td>
<td>Kiwangwa</td>
<td>1</td>
<td>4</td>
<td>1275+/-45 AD 671 (691, 700, 710, 749, 765) 797</td>
</tr>
<tr>
<td>Ua-2097</td>
<td>Kiwangwa</td>
<td>1</td>
<td>5</td>
<td>1440+/-60 AD 556 (608, 627, 638) 650</td>
</tr>
<tr>
<td>Ua-2098</td>
<td>Kiwangwa</td>
<td>3</td>
<td>7</td>
<td>1250+/-60 AD 676 (735, 772) 863</td>
</tr>
<tr>
<td>Ua-2095</td>
<td>Masuguru</td>
<td>2</td>
<td>4</td>
<td>1290+/-60 AD 660 (686, 754, 757) 797</td>
</tr>
<tr>
<td>Ua-2096</td>
<td>Masuguru</td>
<td>4</td>
<td>4</td>
<td>1430+/-60 AD 562 (639) 654</td>
</tr>
<tr>
<td>Ua-2092</td>
<td>Kaole</td>
<td>1</td>
<td>9</td>
<td>1270+/-60 AD 667 (692, 699, 712, 748, 767) 801</td>
</tr>
<tr>
<td>Ua-2093</td>
<td>Kaole</td>
<td>4</td>
<td>7</td>
<td>1130+/-60 AD 781 (885, 922, 939) 984</td>
</tr>
<tr>
<td>Ua-2094</td>
<td>Kaole</td>
<td>3</td>
<td>6</td>
<td>1200+/-60 AD 1258 (1279) 1285</td>
</tr>
<tr>
<td>Ua-2089</td>
<td>Changwehela</td>
<td>1</td>
<td>8</td>
<td>870+/-50 AD 1042 (1163, 1174, 1188) 1221</td>
</tr>
<tr>
<td>Ua-2090</td>
<td>Changwehela</td>
<td>1</td>
<td>9</td>
<td>650+/-60 AD 1279 (1296, 1375) 1591</td>
</tr>
</tbody>
</table>

and the 5th century AD (Soper 1967b, Chami 1988a, b; Sinclair 1991), this would indicate that the TIW tradition had its formative period around the 4th–6th centuries AD.

Also in the main layers of the TIW occupation, at 60–40 cm, 70–40 cm and 50–40 cm at Misasa, Mpiji and Kiwangwa respectively, TIW pottery is associated with imported artefacts. These include the Sassanid ware, glass and beads. The production of alkaline-glazed products started in Roman and Parthian times, from the 3rd century BC to the beginning of the 3rd century AD. The use of such products continued throughout the Sassanid period (c. 226–642) and in the early Islamic period to about AD 750 (Lane 1947, pp. 8–9; Whitehouse 1972, p. 70; Pope 1939). The absence of any typical Islamic goods associated with the TIW materials at the three sites indicates a date for these sites before the 8th century, the period before Islamic art came into existence (Lane 1947; Tampoe 1989). The association of the EIW elements and the Sassanid pottery would therefore mean a date between the 4th century and the end of the 7th century AD.

Close study of the Kaole chronology, however, offered further chronological data. The lowest layer of the site at the Kaole hill is represented by the TIW tradition. Unlike the other sites where Sassanid ware was recovered, the Kaole site was found to have early Islamic, white-glazed ware. In the succeeding, non-TIW layers, lustre and sgraffiato ware were found. It is concluded that the TIW occupation at the Kaole site could not be dated before AD 750 (the beginning of such Islamic ware) or later than AD 1000 (the beginning of lustre and sgraffiato) (Chittick 1974, p. 319).

10.3 Radiocarbon dating

As good samples of charcoal were recovered from many of the levels excavated (Chapter 8), a number of charcoal samples were submitted for dating. A total of 18 charcoal samples were analysed from the six sites excavated in both Phases One and Two. In Table 21, the first 15 samples were collected from the levets of the TIW tradition, and hence they were the most appropriate for the discussion in this section. The last three are from the post-TIW tradition (and hence worthy of a discussion elsewhere).

According to Table 21 and Fig. 27, therefore, the TIW tradition can now be dated to between the 4th and the 10th century AD. The Misasa site is more informative for the early period. The charcoal sample recovered from the early, faint, occupational layer (80 cm) has offered the earliest date in the 1st century AD (Ua-2593). The charcoal from this layer was associated with a few fragments of iron. As no pottery was recovered from this earliest layer, it cannot be regarded as the beginning of the TIW tradition. It should rather be regarded as that of the past EIW tradition. A similar date was obtained for the EIW site at Limbo in the vicinity. A charcoal sample from a subsequent layer (65 cm) in the same trench in Misasa, well associated with a good number of TIW sherds, gave a date in the 4th
that the formative period for the TIW tradition was the 4th–6th centuries AD, and that it flourished along the littoral and in the hinterland of the central coast of Tanzania in the 7th century AD.

Turning to the Kaole site, the radiocarbon dates in the 8th and 9th centuries derived from the TIW layer (Ua-2092 & Ua-2093) indicate that the last phase of the TIW tradition coincided with the spread of Islam to East Africa. This agrees well with the finding of early Islamic goods in the same layer.

At this juncture, therefore, it is sufficient to conclude from the relative and absolute datings that the TIW tradition manifests two phases: an Early TIW phase before the 8th century and a Later TIW phase after the 7th century and probably up to the 11th century AD. I termed the first phase Azanian (cf. Chapter 4 in this volume; Casson 1990, Sutton 1990, pp. 89–91) or pre-Islamic and the second phase Zanjian (cf. Chapter 4 in this volume; Trimingham, 1995) or Islamic.

The Early TIW phase is characterized by the pottery and the radiocarbon dates from Misasa, Mpiji, Kiwanga and Masuguru. In terms of pottery (Chapter 8), the assemblages from these sites have many EIW pottery elements and diverse elements of TIW decoration. Sasanian pottery marks the pre-Islamic trade.

The Later TIW phase is represented by the pottery and the dates from Kaole. The pottery has few EIW elements, with triangles and oblique- and double-zigzag incisions predominating. There is a diminishing interest in decoration, indicated by many sherds being undecorated and having a smaller number of decorative elements. This period is marked by the coming of Islamic, white, tin-glazed wares and immediately afterwards by sgraffiato ware.

10.4 Discussion

It should be noted that many TIW sites on the coast of East Africa had been dated to the 8th–10th centuries before the above finds were made. However, these dates were obtained by comparing the pottery with ceramics from the Middle East and China. As has been shown, unless this method is checked by local sequences and the use of reliable radiocarbon results, its former justification is no longer tenable.

The radiocarbon dates reported by Horton (1987, p. 295) from Shanga, for instance, seem to agree with the assumed, relative, ceramic dates between the 8th and the 11th century. This means that Shanga belongs to the Later TIW phase, which would agree with the finding of wooden mosque structures.

However, the two dating methods disagree as regards
the Manda site. The radiocarbon dates in the 6th and 7th centuries obtained from the lowest layer at Manda (Horton 1987, p. 295) would, if accepted, place the TIW tradition there in the early phase. However, these dates were refused, because they do not fit the 8th-11th-century, imported-ceramics model (Chittick 1967, p. 49; Horton 1987a, p. 296). Manda has therefore been dated unjustifiably to the Later TIW phase.

Abungu (1989, p. 212) dated the TIW site of Ungwana to the 10th century by using the above, relative-dating model. His imported pottery wares for the 910-1150 period are green/blue Sassanian Islamic, Islamic white-glazed, and incised sgraffito. The alkaline-glazed, green/blue pottery found in the early phase of the Islamic period in the Middle East came to be termed “Sassanian Islamic” owing to “its origin in the Sassanian times” (Tampoe 1989, p. 31) and “ultimately from the Parthian blue-glazed wares” (Chittick 1966a, p. 162). However, contrary to Abungu’s relative dating, it is unlikely that its production continued beyond AD 815 (Tampoe 1989, pp. 78-9).

Unguja Ukuu was originally dated by a gold coin of Caliph Harun al-Rashid, who ruled in AD 798-9 (Chittick 1966a, p. 163). However, the coin did not come from the archaeological context but was found by treasure hunters. The absolute date helped to strengthen the idea that the TIW sites had their origin in the Later TIW phase after the 7th century. Recent excavation, however, has dated the early occupation at Unguja Ukuu to the 4th century AD (Juma 1993). This agrees very well with the dates from Misasa, which firmly put the origin of the TIW tradition in the early phase.

Although the Kilwa Periods 1a and 1b show elements of the Early TIW phase observed in Misasa, Mpiji and Kiwangwa, Chittick (1974, p. 319) has used imported ceramics to date the occupations to the 9th and 10th century AD, and hence to the Later TIW phase. However, it should be noted that a radiocarbon date of AD 630 reported by Chittick (1966a, pp. 9-10) from Period 1 indicates that the TIW tradition there was founded in the Early TIW phase.

The same problem applies to the Comoros sites, where TIW sites have been dated to the 9th and 10th centuries AD (Wright 1984). Existing earlier dates have been neglected, owing to assumptions about the Indian Ocean sea-water effect (Wright 1984, pp. 54-5).

In Mozambique, the Chibuene site dated earlier to the 9th century, following the above, relative-dating model (Sinclair 1982), has now been dated to the 5th-7th centuries in recognition of the problems inherent in the imported-ceramics model. According to Sinclair (1991, p. 190), the lower occupation at Chibuene, which has been dated to the later first millennium, contemporary with Kilwa 1b on the basis of ceramics and a series of carbon dates, is further dated from mid to late first millennium.

This new position puts Chibuene in the Early TIW phase. Similarly, Adamowicz has dated the Monapo TIW layer to AD 600-900 (Sinclair, Morais, Adamowicz & Duarte 1993, p. 425).

In Madagascar, the Irodo site is dated to the 8th and 9th centuries but has no TIW pottery or Sassanian pottery (Vénin 1986; Sinclair 1991, p. 195).

To summarize, the result of the analysis of the association of cultural material and radiocarbon dates has given important, new, chronological information about the first-millennium AD settlement along the coast of East Africa.

The Early TIW phase dates from the 4th to the end of the 7th century, a period associated with Sassanid trade goods (alkaline-glazed ware and glass). The Later TIW phase started at the beginning of the 8th century and survived to the 10th century. This is an era related to the introduction of Islamic products. The implication of this new recognition will be discussed in the next chapter.
11. THE BEGINNING, SPREAD AND END OF THE TIW TRADITION

My case so far has been that, in the East African coastal areas, a major cultural tradition developed, based on its own socio-economic structures and natural resources. The tradition has been identified in this work by its triangular, incised ware, as the TIW tradition. The socio-economic strength of this tradition enticed trade from abroad, beginning perhaps in the early part of the first millennium AD.

In order to relate the underlying problems of this work to the new results, the discussion in this chapter is conducted under the following sub-headings: the beginning, the spread and the end of the TIW tradition. The section on the beginning aims to discuss the problem of the origin and the development of the tradition, and hence when, where and how. This first section concerns the first problem in Chapter 4. The section on the spread aims at discussing the distribution of TIW sites and the mechanism of their spread. This is closely related to the second problem in Chapter 4. Aspects of cultural affiliations (the third problem in Chapter 4), are also outlined in this section, although they feature in all sections of this chapter, as we perceive the TIW tradition developing from the EIW tradition. The section on the end of the tradition discusses the factors affecting the cultural process on the coast of East Africa in the first millennium AD and hence gives a better understanding of the subsequent cultural and economic relationship between the hinterland and the littoral.

11.1 The beginning of the TIW tradition

When did the TIW tradition begin? Currently, Misasa and Unguja Ukuu are the only sites that have offered firm, early dates for the TIW tradition. Other sites that could be equally important, if their chronologies were to be properly re-examined, are Kisiju (Harding 1960) and Kilwa (Mattern, ongoing research). The charcoal sample from the Misasa initial occupation, which was associated with iron fragments and slag, was dated to the 1st century AD. This early date coincides with the period when the early iron-using communities were establishing themselves on the coast. The early iron-using site of Limbo had its initial occupation dated to this period (Chami 1988a, 1988b; 1992b). The area around Misasa has other EIW sites, which, although reported, await proper study (Fawcett & LaViolette 1990). EIW sites have also been found in other areas with TIW sites. They comprise Kilwa and Unguja Ukuu (Sinclair, Morais, Adamowicz & Duarte 1993; p. 427; pers. observation), Dar-es-Salaam, and Kilosa in the far hinterland (Msemwa 1992; Chami 1991). On the northern Mozambican coast, EIW sites have been reported to pre-date the TIW tradition (Sinclair, Morais, Adamowicz & Duarte 1993) and, to the south, the EIW tradition at Matola is dated to the beginning of the 1st century BC (Sinclair 1987, 1991). This implies that the EIW communities preceded the TIW tradition on the central and southern coast.

The TIW tradition was initially thought to have been founded on the northern coast of East Africa in the 8th-9th centuries AD by either Arabs/Persians or Pastoral Neolithic (Cushitic) people (Chittick 1984; Horton 1987a, 1990). However, following the reports of the EIW sites on the central coast of Tanzania (Fawcett & LaViolette 1990; Chami 1988b, 1990), the proponents of the 8th–9th-century date have changed their minds. A date in the first century AD is now thought to be appropriate for the beginning of the TIW tradition on the central and southern coast. It has also been thought that the tradition would have preceded the early iron-using settlements. According to Horton (1990, pp. 96–7),

The early first-century date of the Periplus, and the implication of a population settled for a considerable time on the coast and in commercial contact with the Red Sea, would appear to rule out Early-Iron-Age Bantu communities. Radiocarbon dates from sites producing KAPE ware, or on the southern coast with Matola-tradition pottery, indicate settlement later than the time of Periplus.

and therefore:

It is certainly clear that Tana-tradition pottery cannot be derived from KWAle or other Early-Iron-Age ceramic groups. While these Tana-tradition sites are undated, there remains a possibility that such pottery represents the Periplus-period ceramic groups, derived from a "pastoral neolithic", presumably Cushitic-speaking population.

The foundation for Horton's very early dates for the TIW tradition (His Tana) is the report of the late AD dates (Chapter 8) from the Misasa site (Fawcett & LaViolette 1990). It should be noted that the report clearly states that the dates require further clarification.
Unpublished reports also indicate that the charcoal samples might have been contaminated by chemicals or possible recovery problems. It is no doubt still too early to determine the date of the beginning of the TIW tradition. Moreover, the Cushitic aspect is incomprehensible, since no single Cushitic or Pastoral Neolithic site has been found on the coast of East Africa.

The lowest level with TIW-tradition pottery at Misasa has in this work been dated to 335 ±45 AD. This is also the period of the decline of the EtW tradition at Limbo and soon on the whole coast. The TIW tradition matured at Misasa at the end of the 6th century and at the other sites reported above in the 7th century, coinciding with the introduction of imported glass, Sassa­nid ware and glass beads. By this period, the TIW tradition on the central coast had completely been transformed into the TIW tradition. Except for the Chibunes and Monapo TIW sites reported to have had mid-1st-millennium dates (Sinclair, Morais, Adamowiecz & Duarte 1993), other TIW sites on the coast have been reported to have had post-7th-century AD dates associated with Islamic ware (Horton 1987a; Chittick 1984, 1974; Wright 1984; Abungu 1989).

Two phases for the TIW tradition (Chapter 10) which recognize the new chronology have already been suggested: the Early TIW phase is the period from the end of the early iron-using tradition (in the 4th and 5th centuries AD) to the nature of the TIW tradition (in the 6th and 7th centuries AD). The Later TIW phase is the period from the beginning of the 8th century to the end of the first millennium AD. The early phase would probably help us to understand the pre-Islamic, Azanian coast, which is reported in the Graeco-Roman documents, and the later phase would probably explain the Islamic period when the Arabs recognized the coast as the land of Zanj.

Where did the TIW tradition originate? From the data discussed above, the TIW tradition probably first began on the central coast of Tanzania or further to the south. The most probable area—to which I would direct much more research—is between the Wami River in the north and the Rufiji River in the south (Map 8). Several factors favour this central coast.

First, the area receives three major rivers bringing waters from the deep hinterland of present-day Tanzania. Although not navigable, these rivers have provided a natural connection to the heart of the region assumed to be the origin of the early iron-using communities in western Tanzania and the interlacustrine region. The river valleys, deltas, estuaries and muddy, shallow seas would also have functioned as the basis for different subsistence activities (Chapter 6), exploitation of mangrove wood on the estuaries, and fishing.

It has also been shown (Chapter 6) that the shore between Bagamoyo and Kisiju is aligned to the sea in such a way that any ship driven by strong, north-easterly trade winds would naturally land in this area, if not blocked by Zanzibar Island in the same area, 15 km from the mainland. This is also the area where strong, south-easterly trade winds start driving the northbound ships to the northern Indian Ocean and the Red Sea (Datoo 1975).

Secondly, the area is climatologically wet enough for agriculture and tropical forests, especially behind Kisiju in the Kisarawe zone (Map 10). This particular factor, coupled with the inland lakes, for example, Zakwati and Manzi, was one of the major reasons why it was decided to survey the district of Kisarawe for early sites in 1987 (Chami 1988a).

Thirdly, it has been suggested linguistically that this central coast was possibly where the coastal languages in East Africa originated. "From presently available linguistic studies, Sabaki Bantu first appeared somewhere around the Ruvu River in northern Tanzania and spread northwards, possibly as far as the Juba River" (Pouwels 1987, p. 21).

Fourthly, historically, it has been strongly suggested in the works interpreting the Periplus document that the most southern emporium visited by the Graeco-Romans was around Dar-es-Salaam via Zanzibar (Datoo 1970; Kirwan 1989; Casson 1989). The peninsula which ships could not avoid landing at when sailing southward from Menuthia (Zanzibar) is thought to have been Dar-es-Salaam. The peninsula extends southward to the bay of Kisiju and the estuary of the River Luhute (Rufute). According to the Periplus, the emporium was some distance from a bay towards the interior along a river. The emporium's name (Rhapta) was also the name of the river and the bay. The meaning of Rhapta was "sewn boats" (Casson 1989, p. 61). The River Luhute (Rufute), which enters Kisiju bay, has a meaning very close to the Periplus' Rhapta. Rhapta is certainly a corruption of an ancient river name very similar to the present-day Rufute.

Fifthly, the area between Dar-es-Salaam and Kisiju towards the hinterland requires much more research, for the following archaeological reasons:

First, Harding (1960) reported a first-millennium-AD site in Kisiju. He suggested a date in the 4th–6th centuries from the use of imported artefacts:

"The fragment of glass ... is very similar to glass found in Anglo-Saxon graves. The glass is thin, clear, and full of minute, drawout, air spaces. It is cobalt blue in colour and has a slightly raised ribbon-like pattern in white opaque glass. It was recovered from the swamp in association with the Frankish bead ... and with the earliest Indian beads."
Prof. Gräslund, of the Department of Archaeology at Uppsala University, managed to meet Mr D. M. Wilson (quoted in Harding 1960, p. 138), who confirmed that he had seen the Frankish bead. The Kisiju site was also reported to have copper crucibles and many local potsherds.

Secondly, 12 km towards the hinterland is situated the centre of the 1st–7th-century AD sites, comprising those of the EIW and the Early TIW phase discussed in this work (Chami 1988a, 1988b, 1992b; Fawcett & LaViolette 1990). They include the Limbo EIW and the Misasa TIW sites.

How did the TIW tradition begin? This question remains difficult to answer. What took place in the period before the introduction of iron technology on the coast at the end of the first millennium BC is still unclear. Ongoing research around Kilwa and in the Bagamoyo hinterland indicates that Late Stone Age people were present along the coast before the introduction of iron technology. At the beginning of the first century AD, pottery-making was introduced. The pottery of this new tradition is bevelled, fluted and decorated with narrow, incised or stamped bands. Sites of a similar tradition (EIW) are to be found in other parts of eastern and southern Africa, being earliest in the lacustrine region (mid first millennium BC) (Phillipson 1985).

According to our present knowledge, a few centuries of life on the coast generated some changes in the original way of life of the early iron-using communities. At the beginning of the TIW tradition in the 4th century AD, four aspects can be inferred.

First, there is a change in pottery art. The early iron-using pottery is transformed into TIW pottery. The transition period is observed in the sites where EIW pottery elements constitute over 40% of the design elements (Fig. 16 and Table 12).

Secondly, at the transitional sites, the first introduction of other metals, apart from iron, is observed. Copper becomes widely used at all TIW sites. This metal appears either in the form of ornaments (bangles, rings, chains), tools (hooks, spikes) and sheeting. At Mpiji, numerous pieces of lead were recovered.

Thirdly, for the first time, the farming communities show signs of involvement in a wider network of Indian Ocean trade. Goods are coming to these sites from India, the Middle East, Europe and China. Alkaline-glazed and Chinese porcelain, glass vessels, glass beads and stone beads (carnelian) are found at the Early-TIW-phase sites (Chapter 7).

Fourthly, there are archaeological indications of population growth in this period of transition. Compared with the few, less than one hectare, EIW sites on the coast (Soper 1967a, Chami 1988a), more than 20 TIW sites are now known (Map 2), most of them having sizes ranging from two to more than fifteen hectares (Chapter 7; Chittick 1966, 1984; Horton 1984; Horton & Clark 1985; Wright 1984, 1993). This is a clear indication that there was a population growth.

The third and fourth aspects would probably be among the factors that could help to explain how cultural change took place among the early-first-millennium inhabitants of the coast. Similar factors are known to have triggered homeostatic readjustment in the formation of Mesoamerica and the Aegean, leading to major cultural transformations. Trade would be likely to stimulate material production, the rise of a wealthy elite, and hence the evolution of new cultural norms and organization (Renfrew 1969, pp. 158–160).

Population growth takes place where there are abundant resources to feed large numbers of people; consequently, a need to minister to the demands of the growing population would lead into both political and economic re-organization (Hirth 1978; Carneiro 1970; Brumfiel 1976).

Following a similar model, the EIW communities on the coast of East Africa would necessarily have adjusted themselves to the abundant coastal resources, which include marine and land resources (Chapters 5 and 6). The subsequent growth of population and the growing local and inter-oceanic trade would require organization and hence the emergence of regional elites, who would probably rule and control trade. The rise of the elite group would go hand in hand with the rise of an affluent class within the TIW communities, whose culture would probably radiate over the areas they influenced, hence the rise of a regional tradition manifested in similar archaeological materials, especially in pottery. Large sites, for example, Kilwa, Unguja Ukuu and possibly others still to be identified would probably have played a central role, as is indicated by the occurrence of an abundant variety of goods, both local and imported.

What I wish to make clear here is that the emergence of the TIW tradition from the EIW background does not entail the coming into the region of new people or immigrants. While there may have been some inputs from foreign traders, some of whom might settle, the transformation occurs within the communities of the early iron-using people. These same people are likely to have acquired and adopted new cultural norms to cope with the changes appearing in their cultural system. The best living example of this is to be observed among the modern African communities which have adopted Islam or Christianity. The major part of their traditional system broke apart, because of new values,
The earliest sites studied in northern Madagascar, i.e. Irodo (9th century AD) and Mahilaka (12th century AD), have shown connections with the coast of East Africa, instead of Austronesia (Vérin 1975, p. 184, 1986). Vérin (1975, p. 191) thought that the solution to the Austronesian problem could be solved by the finding of “sites on the African coast anterior to the ninth century”, whose material would show Austronesian links. All the early TIW sites dealt with in this work are anterior to the 9th century. No find, however, can be attributed to the Austronesians.

It has also been shown in Chapter 3 that many crops and cultural items found in Africa have been attributed to Austronesians (Jones 1971; Vérin 1975, pp. 175–7). These crops include coconuts, rice, bananas, yams, and sugar cane and the cultural items include xylophones, dug-out boats, outrigger canoes, board games, and metal crafts. The speculation that these items came from eastern Asia awaits concrete evidence. Some of these items could also have been exported from Africa.

Whatever forces contributed to the cultural transformation on the first-millennium coast of East Africa, a fully-fledged TIW tradition was widely distributed over the littoral and in the immediate hinterland by the 7th century AD. At this period, it seems that a people enjoying cultural and economic unity can be deduced from similar archaeological sites. We also see the introduction of a variety of foreign goods, indicating trade and the emergence of an elite group. There is exploitation of copper, lead and probably other metals.

It is interesting to note that the peak of the TIW tradition in the 7th century AD coincided with the expansion of the Sassanid empire to the Indian Ocean after the defeat of the Abyssinians about AD 579 (Ricks 1970; Toussaint 1966). Consequently, they established brisk trade connections with the coast of East Africa, as is testified by the Sassanian pottery and glass from the East African sites. It is in the same period, the 6th-7th centuries AD, that the fast expansion of the TIW tradition to the major parts of the hinterland and to southern Mozambique takes place. This is probably the period of expansion to the northern Kenya coast. This period has been recognized as the Early TIW phase.

After the 7th century, new TIW sites emerged all over the islands of East Africa and on the littoral. These have been recognized as Later TIW sites, coinciding with the wide distribution of Islamic goods to East Africa. The actual Islamic era starts in the Middle East after AD 632 (the death of the Prophet), but with much emphasis on North Africa and south-western Europe. Its spread to other parts started strongly after the coming to power of the Abbasids in AD 750 (Ricks 1970, pp. 340-1; Hitit 1956; Hodges & Whitehouse 1983, pp. 54–6). After AD 750 Islamic pottery free from the Sassanid influence started to be produced (Tampoe 1989, p. 94).

11.2 The spread of the TIW tradition

The distribution of TIW sites and the nature of their spread to many parts of the coast of East Africa have also been the concerns of recent research (Horton 1987a; Fawcett and LaViolette 1990). It has been suggested that the distribution of the TIW tradition sites favoured the areas occupied by Sabaki-speaking groups, i.e. the littoral and the islands of eastern Africa and the 100-km hinterland of the northern coast north of Pangani and south of the Tana River (Horton 1987a, p. 315). This hurried conclusion was founded on the assumption discussed above, that the northern Kenya coast saw the genesis of the tradition. The TIW pottery was thus thought to have been produced in that region and spread through trade to the rest of the East African coast.

The Tana tradition pottery may have been traded up the Tana, Sabaki, and Usambara rivers from the coast as an inland extension of the coastal trade already suggested (Horton 1984, p. 299).

The present work has shown that this picture of the distribution and the nature of the spread cannot be upheld. The TIW sites are not just confined to the areas assumed to have been occupied by the post-Islamic Sabaki-speakers. As can be seen from Map 2 (and from the data still being collected), the TIW sites cover the whole coast of East Africa, extending as far as 300 km to central Tanzania. There are also strong indications that a Kandaga site north of the central Tanzanian town of Dodoma (Masao 1979, p. 47) and the Ruhunu basin on Lake Nyasa (Mapunda, personal communication) had influences from the TIW tradition. These are areas more than 300 km from the ocean. Other recently identified sites in central Tanzania, for example, Dakawa (Haaland and Kimathi, personal communication) and several in Kilosa (Msemwa 1992; University of Dar-es-Salaam Field School report 1990), would indicate that the tradition was well established deep in the hinterland of the central coast of Tanzania, where the coastal plain provides a 200-km-wide corridor to the hinterland.

While it is well accepted that trade over sea and land was a major factor behind the spread of the whole TIW tradition from the centre of its inception, it is, on the other hand, clear now that the pottery of the TIW tradition was not distributed through trade. The study of TIW pottery from the five sites located at various distances from each other indicates that TIW pottery was...
produced locally within the sites (Chapter 9). Although some trade in local pottery cannot be ruled out, I suggest that it did not play an important role in a wider context. I have argued elsewhere (Chami 1992a) that long-distance trade in local pottery does not agree with the principle of coherence. The whole coast is known to have had locally produced pottery from the EIW period and to have been endowed with resources, i.e., clay, for such products. Local pottery is also known to have been too bulky and fragile for long-distance travel. Long-distance trade in local pottery is possible, but it needs to be shown that it was cheaper and easier to import pottery than to produce it locally.

We should therefore discuss the medium of the spread of the whole TIW culture rather than the pottery. What is suggested from the archaeological data is the settlement of peoples of similar cultural norms in different and distant lands, as portrayed by similar art and cosmology (Wright 1993).

As I observed in the previous section, the TIW tradition actually flourished in the 7th century. It has been shown that this period also coincided with the rapid spread of this tradition to the hinterland, north and south of the coast of eastern Africa. It is likely that traders were sent to the distant areas to establish trade posts. The actual settlement of traders would have been a necessity in successfully managing the wider trade. The communities around the trade posts would then be absorbed or strongly influenced by these possibly protected posts. Over a period of years, the whole region would have been assimilated into the culture and ideology of the trade posts. Hence, trade and actual settlement of the people from the core area would have been responsible for the spread of the TIW cultural values.

It should be noted that this process took place in a land with people of similar cultural roots in farming. Such conditions would have resulted in rapid assimilation of the archaic country traditions into those brought by the traders. In this way, probably because Swahili was closely affiliated to the hinterland languages, in the second part of the second millennium AD, the Swahili traders, their language, and most of their values seem to have rapidly spread all over the same region.

As a corollary to this, the prevailing idea that the holders of the TIW tradition had no cultural and ideological links with their African hinterland can be refuted. According to Datoo (1975, p. 3),

The statement implies that the coast was orientated outwards rather than inward so that it has few if any connections with what is now considered to be its natural hinterland.

According to Horton (1984, p. 299),

The pottery from the Tana/Sabaki and Usambura hills is an exception to this pattern, in that coastal material is apparently found in agricultural communities.

This work has presented strong evidence that the TIW tradition was founded by farmers occupying the littoral areas and the hinterland. While the later Swahili communities tended to orient themselves to the littoral and the sea after adopting Islam, the Early TIW tradition had a cultural unity with the hinterland.

The same can be suggested as regards the spread of the tradition to the islands of Zanzibar, the Comoros and probably Madagascar. Similar cultural materials found at the Unguja Ukuu site (Chittick 1966b; Horton & Clark 1985; Juma & Löfgren 1992) and the Dembeni-phase sites (Wright 1984, 1983) indicate that the actual movement of farming people from the mainland to these islands took place probably in the first part of the first millennium AD. This is supported by the finding of EIW pottery in Unguja Ukuu and Kiwa (Sinclair, Moraiz, Adamowicz & Duarte 1993, p. 427; personal observation). Similar pottery may exist in Madagascar but has not yet been identified (Vérin, pers. comm.).

11.3 The end of the TIW tradition

It has been shown that the TIW tradition flourished from the 4th to the 10th century AD. At its foundation, it overlaps the EIW tradition and, at its end, it overlaps the Swahili settlements. It can also, for the first time, be clearly shown that the TIW tradition can archaeologically be divided into two phases, the early phase being pre-Islamic.

It is suggested that the end of the Early TIW phase marks the actual beginning of the decline of what I would call African culture on the coast. The indicators are the immediate demises of many sites, such as Misasa, Mpiji, Kiwangwa, Masaguru, Lugoba, Dakawa, Mkadini, Unguja Ukuu and possibly many others still to be identified (Map 2). On the evidence of both cultural-material data and datings, these settlements collapsed at about the same time (early in the 8th century). It is obvious that dramatic events happened in the region.

Several models have been used to explain the demise of settlements once well established in an area. These comprise environmental, economic, and political (warfare) models (Drennan 1976; Hirth 1978; Trigger 1978; Gibbon 1984).

According to Drennan (1976, p. 364), the growth of a large population in an area, coupled with various requirements to sustain the growing system, could be heavily affected by serious fluctuations in the environment. He used this argument to explain how the Mesoamerican San Lorenzo and other centres collapsed
after 900 BC. Hirth (1978, pp. 42–3) has shown how shifts in trade centres can lead to the collapse of communities aligned to the original centres.

Competition with other centres may arise when the hinterland of a gateway community extends over a large geographical area. Centres may appear which can function as alternative gateways for areas further into the hinterland and which can weaken the vertical movement of commodities.

Such economic competition may alternatively lead to an “increase in political authority and militarization on the part of the gateway community…” (Hirth 1978, pp. 42–3) with an attempt to eliminate competition through hinterland conquest. The result of this could be disastrous, causing the abandonment of settlements. This is well explained by Trigger (1978, p. 187):

During the Middle Ages, the rich plains of Burgundy, which had been thickly populated, were abandoned because of the repeated incursions of the Vikings...

Other possible ways of responding to warfare include the creation of defence systems, for example, walls (Trigger 1978, p. 187).

It is unlikely that environmental change would have much to do with the demise of the Early TIW tradition. It has been shown that no changes in climate occurred in the Holocene period of an order sufficient to disturb settlements on a massive scale in Africa (Hamilton 1982, pp. 231–2). According to Hamilton (1982, pp. 231–2), the observed change of vegetation is attributed “to the influence of agricultural man”.

On the littoral, however, there is an indication that the fall of the sea level and siltation on the central coast of East Africa could have affected the littoral settlements (Chapter 5). This process could have started at the end of the 8th century and become more effective at the end of the first millennium AD. Such environmental change would lower the ground-water level, dislocate marine resources and even make ports inaccessible. This probably affected the Mpiji and Kaole hill sites (Chapter 7). However, this environmental factor cannot explain the end of other TIW settlements in the hinterland at the same date at the beginning of the 8th century AD.

The economic and war models seem to have worked together, the latter with much more effect. The 8th century AD seems to have been the period when the Sassanid trade domination was being challenged by the Islamic traders (Ricks 1970, pp. 340–41; Hodges & Whitehouse 1983, pp. 54–6). It has been stated above that the flourishing of the TIW tradition coincided well with the overall control of Indian Ocean trade by the Sassanids. It is likely that the replacement of the Sassanid traders by Muslims would create widespread realignment on the coast of East Africa. This probably caused disruption and war that would lead to the collapse of some gateway communities and the emergence of new ones aligned to the new traders. Subsequently, some hinterland communities might also have collapsed, because of changes in the trade routes (Hirth 1978). The same happened when the Germans took over Tanganyika, where, for various reasons, including the avoidance of competition and discontent, they established new settlements away from the traditional ones, i.e. Dar-es-Salaam instead of Bagamoyo, Tabora instead of Urambo, and Kigoma instead of Ujiji. This led into the decay of the old settlements.

The emergence, therefore, of Later-TIW-phase settlements, for example, Kaole, the Comoros and the Lamu Archipelago, and the strengthening of a few earlier ones, for example, Kilwa, at the expense of most of the earlier sites could have been the result of economic realignment.

However, it is unlikely that economic realignment by itself would have led to the end of all the hinterland settlements at the same time. Some of them would probably still be required to feed the new, emerging gateway communities on the littorals. Their termination was likely to have been hastened by other factors, one probably being the new trade direction to the south, where gold was being obtained (Datoo 1975, p. 32; Sutton 1973, p. 10); and another being war, caused by trade realignment and new commercial interests in slavery. War and the slave trade have been shown to have disrupted quite stable communities in both West and East Africa in the period between the 16th and the 19th centuries (Rodney 1972, p. 70; Morgan 1973, p. 190; Gray 1963). According to Morgan (1973, p. 190), in the area northwards from Bagamoyo to Tanga, “ties what might well be termed a no man’s land, because its principal characteristic is a low density of settlement”. Although this could be attributed to drier conditions and difficulties over water supplies, the area was probably depopulated by slave-raiding activities masterminded from Zanzibar through the ports of Bagamoyo and Pangenzi and centred on Sadani. Similar observations have been made about the hinterland of Kilwa and Lindi, where in 1884 it was discovered that slave raiders had left an area of about 250 square miles with “absolutely no inhabitants, though the ruins of more than one village indicated that the district had been fairly well populated” (Gray 1963, p. 249).

Similar events can be supposed to have taken place in the 8th and the 9th centuries, following the appearance of the Arabs on the East African coast. Two factors support this war-and-slavery hypothesis.
First, the Islamic crusade used war as a means of conquest and to replace indigenous ideologies by the Muslim faith. After having conquered Persia, no doubt they would have replaced the Sassanians in their role as traders in East Africa, at the same time imposing their ideology on the population by force. This could easily be performed by local converts, who already controlled the littoral settlements.

Secondly, the rapid expansion of the Muslim empire in the Middle East created a need for labour and construction material, for example mangrove poles, things which are well known to have been obtained from East Africa (Hitti 1956; Ricks 1970). Hodges and Whitehouse (1983, p. 151) observe that:

In southern Iraq, the armies of Zanj (African) slaves, who worked in the fields and sugar plantations, rebelled in 868. The slave revolt lasted fourteen years, during which Basra was sacked and Wasit threatened. At times, the trade route from the Gulf was closed. When, in 892, al-Mutadid ascended the throne, the treasury was empty.

Arab slave traders are also mentioned in Buzurg (10th century) to have been visiting East Africa (Freeman-Grenville 1962, pp. 9-13). This could have been going on from the 7th century onwards (Trimingham 1975, pp. 116–8).

The abandonment of the Early TIW sites in the hinterland and some parts of the littoral, therefore, at the expense of the strengthening and emergence of Later TIW settlements on the littoral, may be explained by the war-and-slavery hypothesis. People were displaced by either war, capture by slave traders or movement to more secure areas.

After adopting Islam, it seems that the people of the littoral settlements acquired a reason for despising, fighting and enslaving their neighbours in the hinterland. As the TIW tradition disappeared in the 10th century, this attitude continued for centuries. Up to the 19th century, the people in the strong towns of Kilwa, Zanzibar and Bagamoyo were still performing the same role of waging war against the peoples of the hinterland and trading in slaves (Gray 1963).

11.4 Concluding remarks

The results of this work have been achieved with the help of the new approach and methodologies discussed in Chapter 3. The weaknesses in previous works have been discussed in the same chapter.

The work has shown that the coast of East Africa had settlements of the TIW tradition in the first millennium AD. They were distributed over the islands, the littoral and the deep hinterland of the Tanzanian coast. Their inhabitants developed various metal crafts and traded with states in Arabia, the Persian Gulf and the Mediterranean.

Two phases have been identified. The Early TIW phase evolved from the EIW tradition around the 4th century AD and terminated around the end of the 7th century. This has been found to have had a strong foundation on the central coast of Tanzania and to have been related to the Azanian period of the Graeco-Roman and Sassanid trade to East Africa.

The Later TIW phase is more identified with the littoral and the islands, dating between the 8th century and the 11th century AD. It marks the introduction of Islamic products and, probably soon afterwards, Islamic ideology. This phase has therefore been related with the period when the Arabic traders referred to the coast as “Zanj land”.

The beginning of the later phase probably saw the end of many hinterland settlements at the expense of the expansion of their littoral and island counterparts. This is explained by the shift of trade from the Sasanids to the Arabs, leading to a change in trade orientation and a change in trade goods. War and slavery might have been other factors destabilizing the hinterland. At the beginning of the second millennium AD, conditions were already ripe for the emergence of littoral communities oriented to the marine trade and hostile to the hinterland. This was probably the beginning of what came to be known as Swahili settlements.

It is expected that the continuation of this research at other sites yet to be properly studied and in the rest of the unexplored land will yield an even better picture of the ancient coast of East Africa. The major approach will continue to be the evaluation of how ancient African communities coped or failed to cope with both the local and the external conditions operative in their environment. This will lead to more enlightenment on the diachronic and synchronic processes.
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