How coffee has been fuelling archaeological research in Western Tigray, Ethiopia

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13. How coffee has been fuelling archaeological research in Western Tigray, Ethiopia

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Abstract. A critical perspective on archaeological research has helped to call out Eurocentric interpretations based on selective emphasis of archaeological results, in which great civilizations were thought to influence the world around them, through grand narratives of colonialism or cultural influence. Instead, an analysis of all excavated materials has shown the feasibility and importance of researching and defining local agency and cultural variations. An ongoing debate about the history of Ethiopia for instance, centres on whether the ruling powers in the first millennium BCE, before the rise of the Aksumite Kingdom (ca. first century CE) were hailing from Saba in South Arabia (present day Yemen) or consisted of local elites emulating Sabaean culture. Yet apart from a few excavations that focused on monumental buildings with stylistic connections to South Arabian art and architecture, excavations in both Ethiopia and Eritrea have found an increasing number of settlements from this era, that do not display such links. An example are the excavations at Mai Adrasha near Shire, Western Tigray, which are summarized here.

Key Words. Ethiopia; Pre-Aksumite; Cultural continuum; Culture contacts; Indigenous; Trade; Metal working.

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1. Introduction

Archaeology's critique of a Euro-centric, Romano-centric and Egypto-centric view of the world and its past, has led to increasing insight in where our blind spots are. This awareness has resulted in revisions of archaeological interpretations and renaming of concepts. The notion of "Rome's trade with India", for instance, was based on Roman textual sources, such as the famous *Periplus of the Erythraean Sea* (e.g. Casson 1980, 2012; McLaughlin 2014), which gives the impression that the initiative was Roman, while archaeological sources on the Red Sea and Indian Ocean trade provide a different narrative, as expressed in publications, such as Roberta Tomber's brilliant *Indo-Roman Trade: From Pots to Pepper* (2008) and D.W. Phillipson's outline of the Ethiopian trade initiatives of the Kingdom of Aksum (1998). Ancient Egypt tends to be considered as a great civilization, but somehow isolated from other Northeast African entities, even if the Red Sea always was an important route for contacts with what now is Eastern Sudan and Eritrea, as illustrated by the excavations of the Pharaonic Red Sea harbours at Wadi Gawasis (Bard and Fattovich 2018) and Wadi el-Jarf (Tallet and Marouard 2014; Laisney, Marouard and Tallet 2024). Our work in the Red Sea harbour of Berenike (Sidebotham and Wendrich 1995, 1996, 1998, 1999, 2000, 2007) has greatly aided in balancing the narrative, and has also been an important impetus for the start of our research in Ethiopia.

Working with several excavators hailing from the Ababda, the local population that lives in the Eastern Desert of Egypt near the archaeological site of Berenike, I was struck by the importance of *jabana* coffee. A sign of hospitality and moment of rest, coffee making includes the roasting of the green coffee beans, grinding the coffee in a mortar together with ginger and heating the coffee several times to the cooking point in a special globular coffee pot, the *jabana*. Then the coffee, which is also called *jabana* is poured in small Chinese coffee cups over a big spoon of sugar. The recipe differs in places, for instance it might be laced with cardamom, or perfumed with incense, but *jabana* coffee can be found along the Red Sea coast from the south of Egypt, through Sudan, Eritrea, Somalia and into all of Ethiopia. In this entire region it is considered of great cultural significance, as expressed by the giant *jabana* sculpture at a crossroads in Suakin, Sudan (Fig. 13.1).

This modest globular pot signals a continuum of putting coffee central in enjoying friendship and receiving guests among people that identify as belonging to different tribes and nation states, separated by natural, physical, language, and political boundaries. A relatively recent historical phenomenon, coffee has not been attested in Arabia before the 15th century CE, but may have been cultivated by Ethiopians in Yemen as early as the 6th century CE (Pendergrast 2010, p. 5). How did this coffee ritual grow roots in this entire region? *Jabana* can

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be considered part of a cultural continuum, underlying commonalities and differences. Without suggesting that this continuum represents a theory of colonization, contact or diffusion, we should recognize that as modern humans we tend to underestimate the mobility and long-distance relationships in the past. The dichotomy of mobility and settled cultures does not take into account that there are always parts of society, ancient and modern, that do not fit one category. There have always been avid travellers in settled society and close links of nomadic populations with nearby settlements. Oral tradition and historical sources of the 19th and 20th centuries hold that nomadic people of the Eastern Desert of Egypt and the Nubian, or Atbara, Desert in Sudan have always interacted closely with the peoples living along the Nile. The term cultural continuum is, therefore, more descriptive than explanatory. The term "culture" has undergone many changes in definition and understanding and is used widely in daily language. Here I use it as an anthropological analytical concept that functions in making and unmaking differences or similarities (Lentz 2017). Culture is thus a complex set of life ways shared by a group of people, who may use it to stress communalities or difference.

If the *jabana* occurs and is held in similar importance along the Red Sea coast and into Sudan and Ethiopia today, might this be indicative of other shared cultural traits? As an archaeologist working in Egypt for most of my career, I have long felt that the focus of Egyptology on the eastern Mediterranean did not give sufficient consideration to the African aspects of the ancient Egyptian cultures. The Nile Valley in the south of Sudan attracted Egyptological attention in the early 20th century, where "Nilotic Peoples", such as the Dinka, Nuer and Shilluk were thought to have preserved habits and ways of life that would help understand the earliest periods of ancient Egypt. It was during the very early days of anthropology that attempts were made to compare the "primitive stages" of ancient Egypt (i.e. the Predynastic period) to 19th and early 20th century "primitive" contemporary Nilotic cultures (Seligmann and Murray 1911a, 1911b; Seligmann 1913; Murray 1956). The northern part of the Sudanese Nile Valley was considered important for its direct connection to Egypt (e.g. Budge 1907), while in the early 21st century it became an attractive area of research as the landscape of Pharaonic Egyptian colonization and cultural entanglement (Smith 2004). Northeast Africa is considered often from an Egypto-centred perspective, where archaeological communalities have been ascribed to direct contact along the Nile or, to a lesser extent by the Red Sea. In spite of some insightful publications (Williams 1999), the question whether there might be material cultural commonalities that we are not aware of is, however, difficult to approach because of the relative dearth of archaeological research in the rest of Sudan, Eritrea and Ethiopia. In an excellent overview of the theories and practical approaches to cultural contacts in the ancient world, Anke Hein (2022) outlines the many ways that archaeologists have tried to explain communalities or differences. It is from the modest goal to contribute to mapping out the archaeology of northern Ethiopia, while considering theories of cultural interaction, that UCLA started work in Ethiopia, starting from the conviction that without good archaeological information it is impossible to understand underlying affinities in the Northeast African region. We started work in an area for which no regular direct contact, colonial or through trade, had been attested and selected Western Tigray, because this is the region west of better known Axum[1] and Yeha, the core area of the Pre-Aksumite findings characterized by architecture and material culture with close similarity to that of the contemporary South Arabian material culture on the other side of Bab el-Mandeb in present day Yemen (Fattovich 2009; Japp *et al.* 2011).

Fig. 13.1 – Suakin, Sudan, 2003: Giant jabana sculpture marking a crossroads (photo by H. Barnard).

1. The spelling of Axum refers to the present-day town, while the archaeological period and cultural phase is spelled Aksum (e.g. Pre-Aksumite).

The UCLA Shire Archaeological Project was thus born from drinking cups of *jabana* coffee near ancient Berenike, sitting and talking with the Ababda participants about how life changed dramatically due to Red Sea diving tourism and Eastern Desert Safaris encroaching on their life-ways. It continued in Mai Adrasha over cups of *buna*, made in similar pots, served in similar cups, with the same intensity, but with a different name, and a slightly different recipe (I must confess that I missed the ginger). From the beginning, working closely with the local population in Shire was central to our work and it turned out to be even more important than we thought. We selected the site of Mai Adrasha, because it was under threat of being excavated away, due to the presence of natural gold in the soil. Our arrival was greeted with enthusiasm and relief by part of the community, in the hope that the destruction could be stopped. Yet ten years later it is also apparent that as any community, the opinions and attitudes of people living near archaeology varies widely, from supportive to indifferent, from an interest in preserving and studying the cultural heritage of the region to gaining income by destroying it.

2. The UCLA Shire Archaeological Project

After an initial visit in 2014, the UCLA Shire Archaeological Project decided to concentrate on Mai Adrasha, a settlement site that within approximately 15 years went from a forgotten part of the landscape to a key archaeological site under immediate threat (Fig. 13.2). Mai Adrasha represented the remains of a substantial settlement, of ca. five hectares (measuring ca. 200 m north-south and 250 m east-west), built of dry-stone walling. In the mid 1970's the area was overgrown with bushes and mostly consisted of fallow land, covered on its western side with fields on which chickpeas or teff were grown. In 2000 it had been noted that the local farmers had started to dig up soil from this large archaeological site. In 2001 the area was surveyed by an Ethiopian-British team (Hagos *et al.* 2003; Finneran 2005) and at that time the alarming estimate was that approximately 40% of Mai Adrasha had been destroyed (Desie *et al.* 2002). The soil in between and over the ancient walls of the settlement contained small quantities of gold that could be retrieved through panning. In an effort to preserve the site, the authorities declared Mai Adrasha a protected area in 2001 and in 2003 a fence was built, sporting three entrance gates marked by stone pillars. When the team from UCLA arrived in 2015 that fence had been removed, the valuable metal wire re-purposed, and only the stone gate posts were the silent indicators of the boundaries of the ancient remains. The destruction had progressed to an estimated 80% of the site (based on surface evidence) lost to illegal excavations (Fig. 13.2). Not only the soil was taken, but the surface of the site was also marked by tracks of the many large trucks that came to the site on a daily basis to cart away the stone blocks that once formed the ancient walls and with it all evidence of the function, organization and inhabitants of this large settlement.

The excavation and survey of the UCLA Shire Archaeological Project took place in monthly periods from 2015-2019, in an area of 100 square kilometre near the town of Shire/Indaselassie, Tigray. The work entailed survey, excavation, scientific study, and conservation of the materials retrieved during excavation, site management and community engagement. Due to frequent changes in the staff dealing with ceramic analysis, this important part of the research had not been finalized and was planned for the following year. Our well-dated stratigraphy provided a strong basis for ceramic analysis, but our planned study season of late 2020 was interrupted, first by COVID-19, and then by the civil war that broke out between the Tigrayan and the central Ethiopian governments, with tacit but devastating involvement of Eritrean troops. In 2024 the situation had stabilized but we learned that in this time of desolation, widespread unemployment and poverty, the hunt for gold at Mai Adrasha and other ancient sites was one of the few ways to provide the local population with income (Gebereamlak 2024).

A comparison of the satellite photographs from 2003-2024 shows the progression of the destruction of the ancient remains. In 2024, agriculture resumed over part of the site that had been dug up illegally, but the substantial depth of stratigraphy underneath seems to be greatly disturbed if not mostly destroyed (Fig. 13.2). The project's storeroom at the regional office in Shire was broken open by invading soldiers, the shelves were removed, boxes with pot sherds and soil samples opened and the contents strewn around (Unpublished report by Gidey Gebreegziabher; Fig. 13.3). Even though we still hope to return to Shire to see what can be salvaged, this chapter provides a summary of the current stage of the research. A detailed research report is in preparation and will

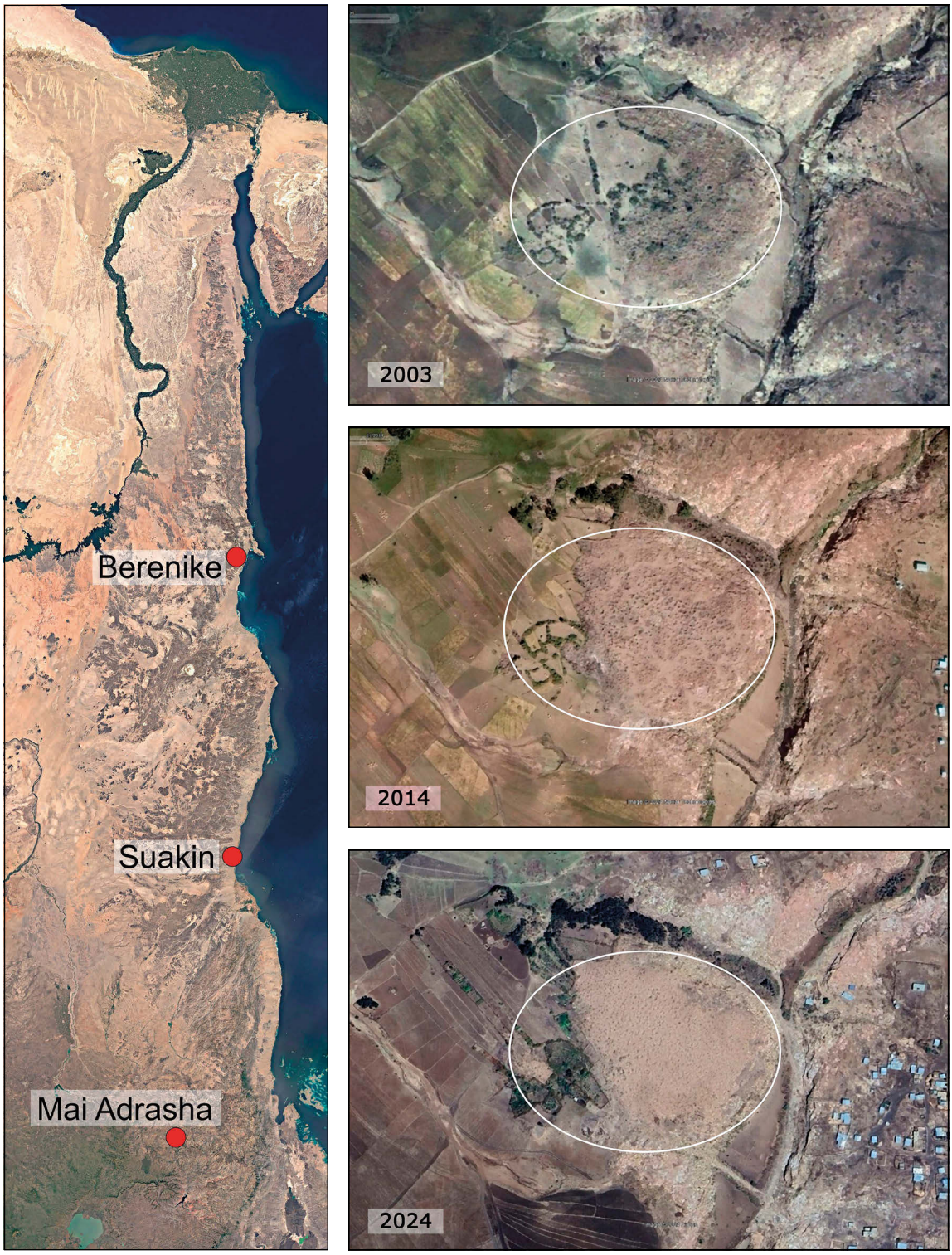

Fig. 13.2 – Google Earth imagery of the location of Berenike, Suakin and Mai Adrasha (left), Google historical imagery of Mai Adrasha in 2003, 2014 and 2024.

Fig. 13.3 – State of the Mai Adrasha storage room in the district's administrative building, 2023 (photo by G. Gebreegziabher).

Tab. 13.1 – Pre-Aksumite and Aksumite chronology (after Bard *et al.* 2014; Harrower *et al.* 2023).

Pre-Aksumite	800-360 BCE
Proto-Aksumite	360-80 BCE
Early Aksumite	80 BCE-160 CE
Classic Aksumite	160-380 CE
Middle Aksumite	380-580 CE
Late Aksumite	580-825 CE
Post-Aksumite	825-900 CE

give full credit to the work of all contributing team members. It will include downloadable data, specify methods and results of the geophysical survey, specialist reports, a detailed outline of the stratigraphy and 92 radiocarbon dates and will include the survey, directed by Matthew C. Curtis and Kifle Zeruhe.

3. Historical context of Western Tigray

In what is currently northern Ethiopia and southern Eritrea, archaeological evidence is preserved going back to before the advent of anatomically modern humans. The remains and artifacts of these early hominids have been the focus of intense scholarly research since the 1970s, whereas the early historical periods have received much less attention (Tab. 13.1). The region was generally viewed as the recipient of the South Arabian culture, from modern-day Yemen, followed by Christianity, from the Near East, and later also Islam. Only relatively recently has this unidirectional flow of cultural influence and political power been questioned and the agency of the native inhabitants been acknowledged (Finneran 2007; Uhlig *et al.* 2017). Around 800 BCE they appear to have organized themselves into a complex society with polities arising around a number of regional centers, including Kaskase, Matara, Mazbar, Seglamen, Wuqro and Yeha. These so-called Pre-Aksumite sites display South Arabian features, including inscriptions in Sabean, written in the Ancient South Arabian abjad (written right to left), but the exact mechanisms behind this phenomenon remain unclear (Sernicola 2021; D'Andrea *et al.* 2023). During the same period further to the north, in what now is Eritrea, Pre-Aksumite sites dated to the 8th-4th centuries BCE have been named the Ona culture (Schmidt and Curtis 2001; Curtis 2009). The sporadic research that was done here, has shown potential links with the Ethiopian highlands and the Sudanese Nile Valley. The settlements on the Asmara plateau were among the earliest known agropastoralist communities in the Horn of Africa.

In the first centuries BCE and CE, Aksum, which lies 60 km east of Mai Adrasha, appeared to have taken primacy over the surrounding polities, with its king taking on the title "king of kings", thus giving rise to the so-called Aksumite period (Phillipson 1998; Sernicola 2021; Bard and Manzo 2025). Many aspects of the material culture changed and inscriptions started to appear in Ge'ez, written in a dedicated abugida, often referred to as *fidal* (written left to right). The Kingdom of Aksum maintained many contacts beyond its borders, leaving archaeological traces much further north and east, as well as in contemporary historical sources, including the anonymous *Periplus of the Erythraean Sea*, most likely dating to *c.* 50 CE (Casson 2012), as well as Procopius of Caesarea's *History of the Wars* and Cosmas Indicopleustes's *Christian Topography,* both completed around 550 CE (McCrindle 1897; Dewing 1914).

Around 325 CE king Ezana made Christianity the official religion of his realm, making it one of the first Christian countries in the world along with Armenia, and Christian symbols started appearing on buildings, coins and other artifacts. In 518 and 525 CE, king Kaleb ordered invasions of the Jewish Himyarite Kingdom, in modern Yemen, to stop the prosecution of Christian groups. This was supported by emperor Justin I and patriarch Timothy IV, who were hoping to curb

the influence of the Sassanian Empire in the Arabian Peninsula. In about 615 CE the Ethiopian king Ashama is said to have given shelter to a group of early Muslims, who at the time faced fierce opposition in Mecca, after which the two religions coexisted more or less peacefully in the kingdom.
As indicated in the discussion below, the deposits thus far excavated at Mai Adrasha have been mostly dated to the Pre-Aksumite period, but push the dates back to at least as early as the 9th century BCE. In general the dates seem to fall into several broad groups: 9th-7th centuries BCE, 3rd-4th centuries BCE, 1st-2nd centuries CE and modern (anything after the 18th century CE). This may be a feature of the particular neighbourhood we have been excavating, considering that most of the town has been dug away. One date of ca. 1250 BCE probably has to be attributed to residual wood or charcoal, because additional samples from the same context give dates around the 8th century BCE. At the same time the depth of deposit of over 4 meters, most of which as yet unexcavated, provides good reasons to consider that this settlement goes back considerably earlier. It strengthens our understanding that the term Pre-Aksumite is not suitable for an indigenous culture with such a considerable life-span.

4. Landscape context of Mai Adrasha

Mai Adrasha is located 2 km east of the town of Shire/Indaselassie, which is the capital of the Western Administrative Zone of Tigray in the Koraro Woreda. The site is located in the northwest corner of our survey area (Fig. 13.4), at an altitude of 1900 m a.s.l. on a flat plain through which runs the main road between Axum and Shire, bordered by mountains on the east and north.
The survey area is bounded by the following UTM coordinates (UTM zone 37P):

- 42 60 00 E / 15 61 000 N
- 42 20 00 E / 15 57 000 N
- 43 90 00 E / 15 49 000 N
- 44 30 00 E / 15 53 000 N

To the south the landscape dips down in a series of canyons, formed by the run-off of a series of natural springs. In the foothills north of the site of Mai Adrasha the Ethiopian church cares for patients who have come to find healing from the mineral-rich waters of one of these. Water also surfaces in the plain just north of the site and has resulted in the formation of the Gumelo water system, which has cut deep valleys that form the natural boundary to the north and east of the site. The Mai Adrasha run-off is just one of several water courses in the UCLA SAP survey area. The Gumelo, Debena, Senbet and Guna Guna / Firfira water course systems run from the Shire plain to the Tekeze river, 33 km south of Shire. These head waters were preferred places to establish settlements, as is apparent from our survey, which identified concentrations of archaeological sites with Pre-Aksumite ceramics that were smaller than Mai Adrasha, but had been established east of the site in similar locations in the landscape: Adi Jamera[2] and Adi Keshef at the head waters of the Debena stream system; Mezaber Adi Menaber at the Mai Anbessa stream, which is part of the Senbet water course system; Adi Abiye, near the Kumil canyon which is part of the Guna Guna / Firfira water system (Fig. 13.4, and Curtis 2018).
The landscape at Mai Adrasha consists of rain-fed cultivated fields on vertisolic soils. The main crops are grain, oil, and legume crops, mainly tef (*Eragrostis tef*), but also finger millet (*Eleusine coracana*), sorghum (*Sorghum bicolor*), maize (*Zea mays*), noog (*Guizotia abyssinica*), sesame (*Sesamum indicum*), and chickpea (*Cicer arietinum*). Vegetables and other seed crops such as peppers, squashes, gourds, onions, cabbage, and sunflowers are cultivated at a smaller scale. Outside the rainy season, farmers use small scale irrigation, retrieving water from wells and streams. The difference between the landscape that has been destroyed by the large-scale gold panning and the undisturbed areas is dramatic. In the part of the site that was used for cultivation undisturbed archaeology was found at a depth of only 10-20 cm. The total depth of deposit was at least 4 meters, but could have been more, because in none of the trenches (with exception of the very shallow deposits in Trench 5) bedrock or virgin soil was reached. The destroyed part is a waste land littered with worked and unworked stone, pottery sherds and other remains, such as fragments of ceramic snake heads and figurines. Between 2017 and 2019 this pattern of land use changed. The soil was panned away from the river and a layer of soil was thus deposited over the destroyed archaeology, which was subsequently being cultivated (Fig. 13.2).

2. This name needs to be confirmed, because the same place was also referred to as Ajaramera and Adi Jona Mora.

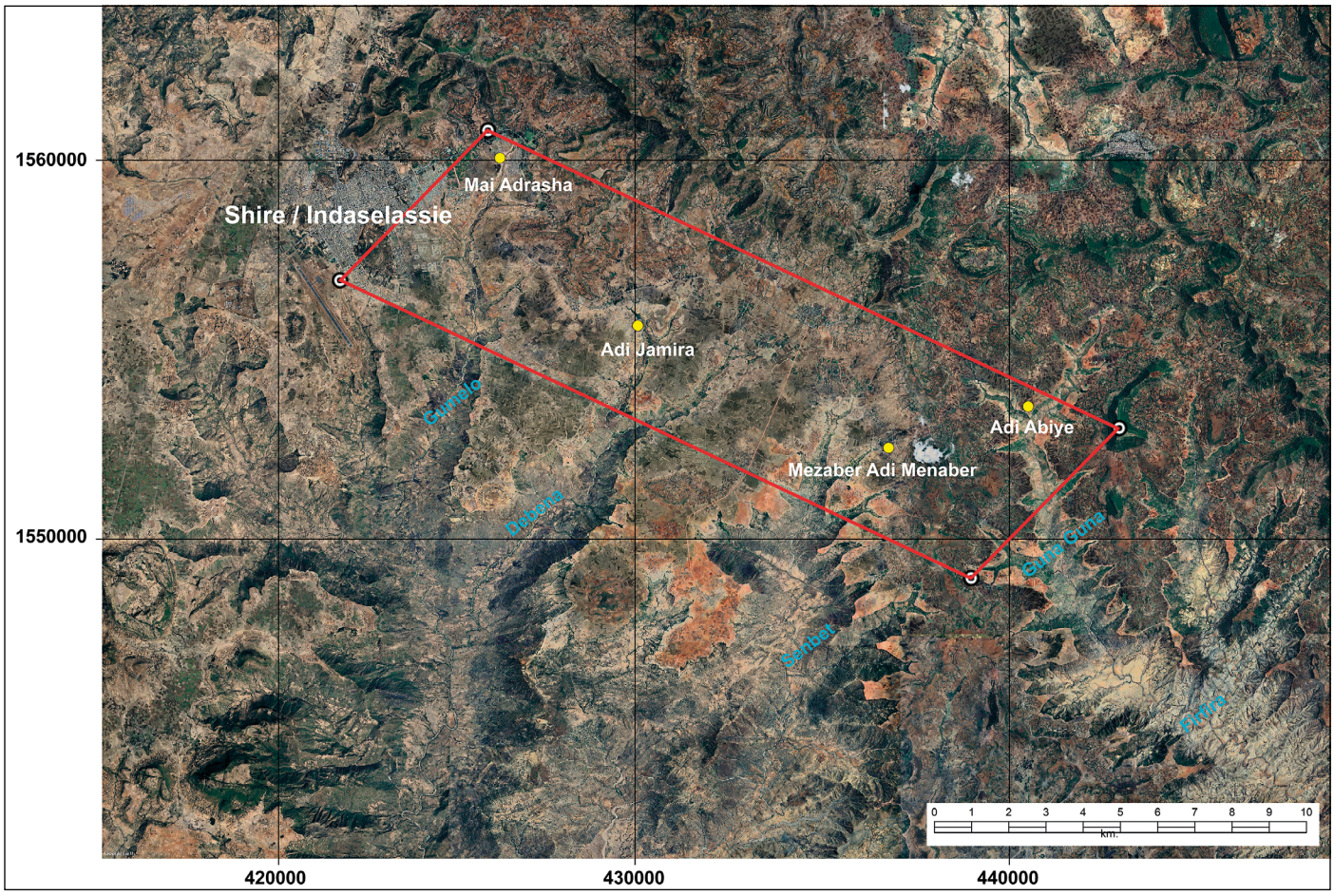

Fig. 13.4 – Survey area, landscape and stream systems near Shire, with at least four settlements at the head waters of major stream systems (Google Earth 2024 image).

Geophysical survey in the agricultural fields included geomagnetic and ground penetrating radar surveys which provided an indication of the extent of the ancient remains to the west and the south of the excavation area (Simon and Markussen 2018).

5. The excavations

The purpose of excavations was mostly exploratory: determining the depth of deposit and time depth of the archaeological remains at Mai Adrasha, refining the stratigraphic sequence through targeted dating of deposits and studying the nature of the agriculture and industries at the settlement. In 2015 three trenches were started, close to the edge with the destroyed area, partially to mark the area as of archaeological interest in the hope to halt the destruction. The stratigraphy in Mai Adrasha turned out to have a considerable depth of probably over 4 meters and excavation was continued in subsequent years in these and six more trenches (Fig. 13.5). In 2019 the end of the archaeological layers was not yet in sight. In the following brief descriptions wall units are indicated with square brackets, deposits with round brackets and pits with triangular brackets. The stratigraphic excavation and recording method used is based on the MoLAS manual, adapted for the circumstances in Ethiopia.

5.1 Trench MA01 – Pre- and Early Aksumite metal working

The location of Trench MA01 was chosen in 2015 in order to assess the extent of preserved architectural remains at the

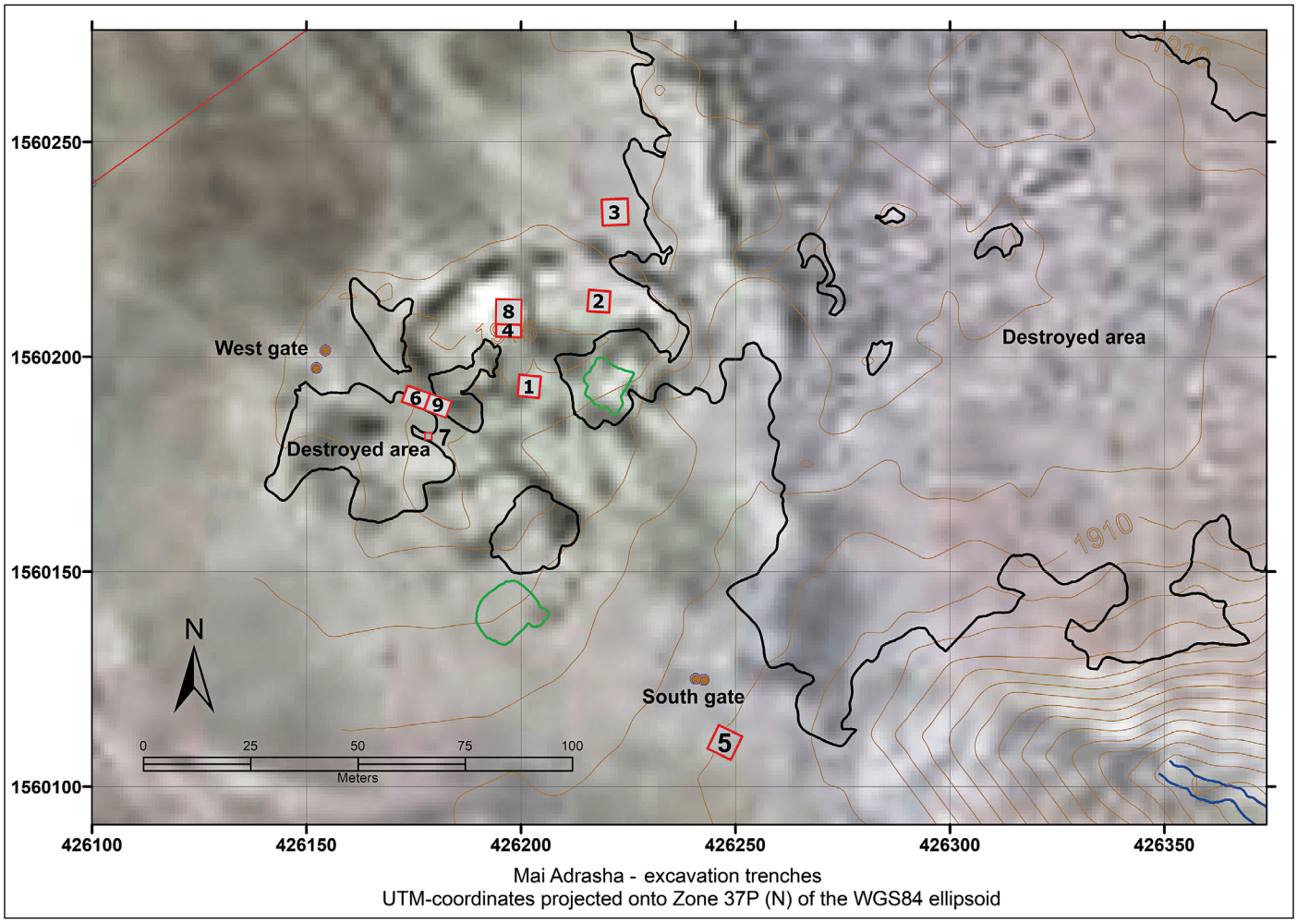

Fig. 13.5 – Location of excavation trenches 2015-2019 at Mai Adrasha. The destroyed areas are outlined in black, 2019 recultivated destroyed areas are outlined in green (as of 2019). Trench 1, 2 and 3 were located close to the border of the largest area of destruction. Trench 5 tested a geophysical anomaly. Trenches 6 and 9 were on a small path between two illegal excavations, trench 7 is a 1×1 sondage immediately south of these. Trenches 4 and 8 explored the side of a high ridge, overgrown with bushes (Google Earth 2014 image, drawing by H. Barnard).

site, close by the area of severe destruction, in the hope to demonstrate the importance of the preservation of the remains (Figs. 13.6-8). Large drystone walls were uncovered in this trench and proved to be a significant location for studying Pre-Aksumite architecture. The walls divided the trench into three areas: a large southwest area (A); a slightly smaller area to the north (B); and a small Southeast area (C). Area C was difficult to excavate and most effort was given to the southwestern and northern areas (see Fig. 13.6). In 2016, sizable amounts of metallurgical remains in the form of slag and crucible fragments were uncovered, providing information on metal production. In both the northern and southwestern areas of the trench there was evidence of large fires: big accumulations of charcoal, sizable blocks of burnt daub, and a red sandy sediment that surrounded these. Excavation of the supposed burn horizon in the southwestern and north areas (A and B) was conducted in 10-15cm increments to add to the understanding of the collapse and the original structure. In the northern part broken, but apparently complete vessels were found.

The oldest phase reached in our last year of excavation 2019, consisted of deposits circumscribed by walls [0245], [0248], and [0003]. Later walls were following the size and orientations of these, hence they are indicated in Fig. 13.6

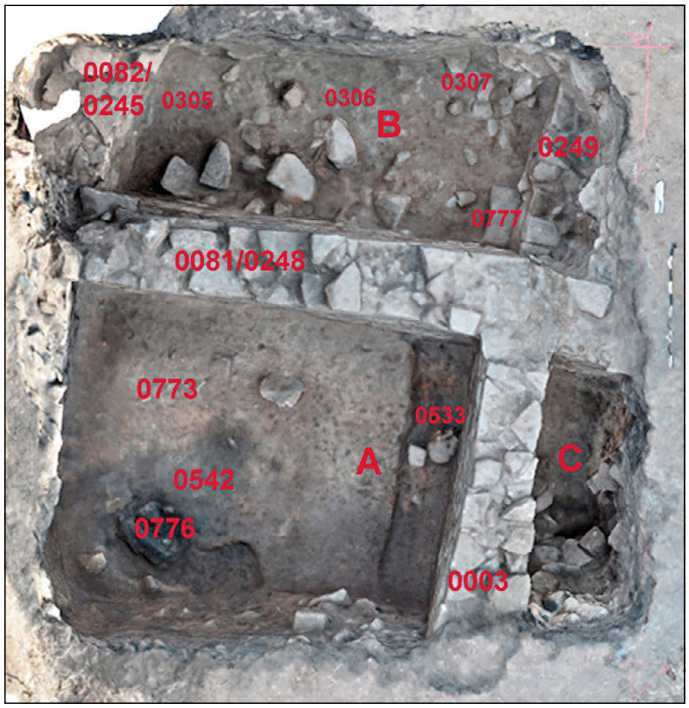

Fig. 13.6 – Trench MA01, characterized by metal working remains dated to the 7th-6th centuries BCE (Area A) and 1st-2nd centuries CE (Area B). Photo from 3D model (Shire Project/A. Brucato).

as [0081/0248] and [0082/0245]. The evidence for fire in the southwestern area A was the main focus of the work, as was the distinction of floor and occupation levels. The north and southwest areas were excavated in small increments of approximately 10-15 cm, however the progress of the excavation was hindered by several episodes of heavy rain fall that flooded the trench. The rain and a subsequent baulk collapse in the north section proved to yield some interesting finds, albeit without firm context, including more evidence of metallurgical work and some stone beads. We hoped to lift a large block of charcoal (0776) and a complete pottery vessel (0533) in the southwest room, but we did not reach the base of either in 2019 and it is unclear whether the backfilled trench is still preserved after the period of further illegal digging.

There are several periods of activity that have been dated with calibrated AMS ^{14}C dates. Underneath the plough zone and overlaying several concentrations of stone wall collapse were pre-modern clay deposits that have been dated to the 17th-19th centuries CE. Most of the wall collapse took place in the 15th century CE and is overlying much earlier deposits. north of wall [0082/0248] several charcoal samples indicated activities in the 1st-2nd centuries CE (area B), while south of this wall in area A, remains were dated to the 7th-6th centuries BCE. In this part of the trench the oldest date attested is the 9th century BCE, based on a charcoal sample from the lower level of a burnt area (0246)[3], separated by stone rubble from a red-yellow burn unit that was over it (0473). The top of this large area with evidence for burning (0310) was also dated to the 7th-6th centuries BCE. It may be that the 9th century BCE date should be considered a residual date from a large piece of charred wood, but may also be indicative of earlier activity, because in the northeast corner of area A a piece of charcoal that was found inside pot (0301) yielded a date of the 8th century CE. Detailed information of the AMS dates will be given in the final report, together with plans, photographs, descriptions and elevations that specify the location of all stratigraphic units identified during excavation.

Trench MA01 thus yielded extensive evidence for burning and metal working. Typically, in village or town contexts, especially those with highly differentiated societies, various stages of the metallurgical cycle become spatially segregated with the formation of specialist workshops and intensification of production. Joseph Lehner who studied the metallurgic remains from the site concluded that nearly all stages of metal production are represented at Mai Adrasha (Lehner 2017). Primary metallurgy is defined broadly as those technologies involved in the reduction of ores into metal, and this is typically observed with smelting slags, partially reduced ores, and certain kinds of crucibles and furnaces. Secondary metallurgy is defined broadly as those technologies involved in the melting of metal, alloying, and its transformation into finished objects. Secondary metallurgy is usually observed with the presence of crucibles, furnaces, moulds, related metal working tools like small chisels and hammers. Together these basic categories comprise part of the so-called metallurgical cycle and defining their presence on or off site forms the basis of interpreting and reconstructing metal technologies and trade/exchange routes associated with them.

In trench MA01 evidence for primary metallurgy was found in area A in the form of copper ore found in a context dated to the 7th-6th centuries BCE (Pre-Aksumite period). Area B, north of wall [0082/0248] had evidence for smelting in the form of

3. Not shown in Fig. 13.6.

Fig. 13.7 – Small crucible found in Area B, dated to the first-second century CE (photo Shire Project/Vanessa Muros).

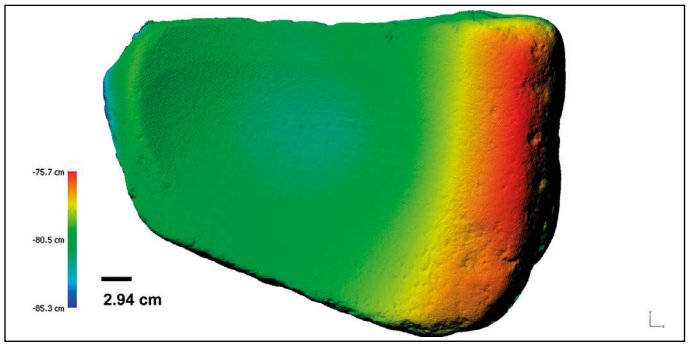

Fig. 13.8 – 3D elevation model of quern (0779), registry number SH19-4939-GK from Area B, with deep striations in the working surface (Shire Project/Weiya Li).

Fig. 13.9 – Almost complete ceramic vessel SH18-4537-aa from unit (0244) in the northeast corner of Area A, Trench MA01 (photo Shire Project/Vanessa Muros).

slag and possible furnace lining in several deposits, all dated to the 1st-2nd centuries CE (Early Aksumite period)[4]. Evidence for secondary metallurgy, or melting, was found in this area as well: eight small crucibles were recovered (Fig. 13.7), one of which was found in the fill (0293)[5] of a vessel that was found in the north baulk of the trench, another in the fill of a large vessel, that may have been a brazier (0292), which stood on surface (0290). These crucibles were small and conical, with diameters ranging from 5-10 cm and a depth of up to 14 cm. The volumes indicate that these were small melts, perhaps for small tools or jewellery. Residue analysis of the interior areas demonstrated both copper and copper-tin alloy melting, which provides strong evidence for the local production of bronze items.

Other trenches also had indications of metallurgic activity, but not to the extent as was found in trench MA01, which seems to have been an industrial area with several burning events. No indication of activities that may have been related to food preparation were found, perhaps with exception of a well-preserved granite quern (0779), which based on the type of coarse striations (Li 2019), could well have been used for metal working (Fig. 13.8). It was found embedded in deposit (0309) and resting on some broken pottery and smaller stones adjacent to the wall of area B, similar to the method

4. Units 0083, 0132, 0202, 0203, 0205, 0209, 0249, 0284, 0310, not shown in Fig. 13.6.
5. Not shown in Fig. 13.6.

Fig. 13.10 – Trench MA02, during excavation in 2019 (photo Shire Project/Dil Singh Basanti).

used to stabilise querns and their placement near walls in present day houses in the region. It therefore seems to be *in situ* and exemplifies the type of activities that occurred before abandonment and destruction. Below the 1st-2nd centuries. industrial remains in area B were several deposits of almost complete, but broken vessels, lined along the north side of wall [0082/0248][6].

Above the 6th-7th centuries. BCE layers in Area A, but below the major collapse, there was another large burn layer, which contained mainly ceramic finds, such as the almost complete vessel, found in the northeast corner against wall [0003] (Fig. 13.9).

6. Area B vessels: units 0300, 0302, 0303, 0535, 0536.

5.2 Trench MA02 – Pre-Aksumite platform and agricultural storage

MA02 was a 5×5 m trench that was excavated from 2015-2019 field seasons and back-filled in the periods in between, to allow the land to be used for agriculture (Figs. 13.10-15). In this area all dated activity could be solidly placed in the Pre-Aksumite period, in which extensive architectural building and re-building sequences occurred, with as its main feature a well-planned platform (Figs. 13.10-13). Our work revealed three phases of Pre-Aksumite occupations and construction. The oldest building phase we identified comprised a space delineated by walls [0460], [0457] and [0458], which was built over in a second building phase, which included wall [0455] (Fig. 13.10). In our last season our purpose to understand this

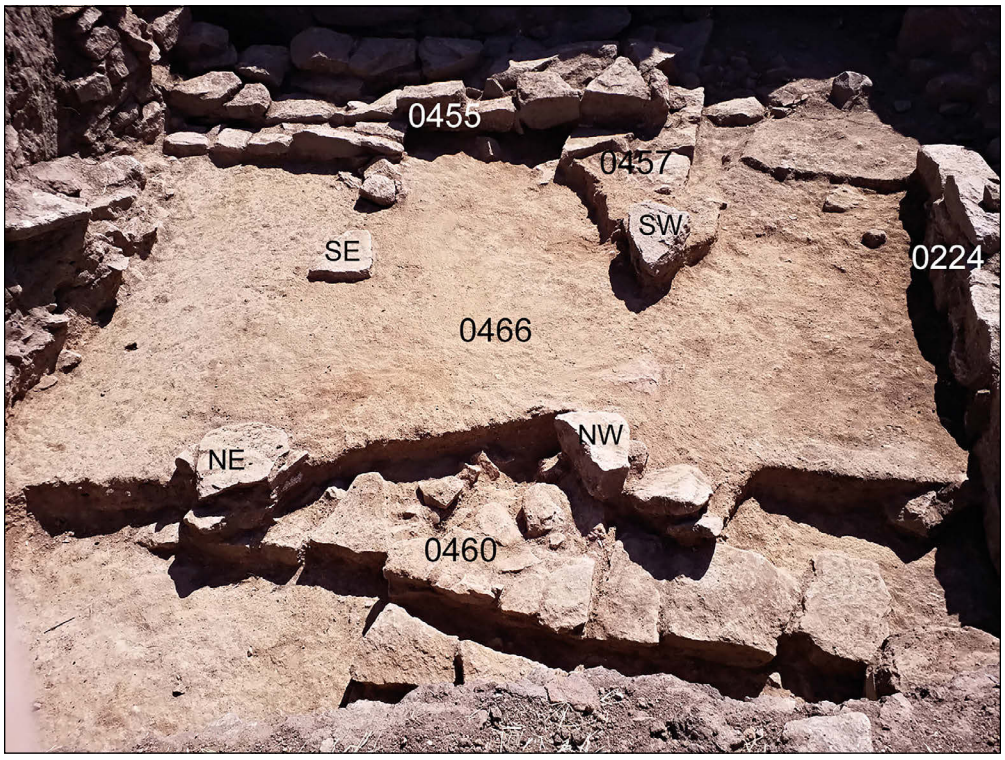

Fig. 13.11 – The four corner stones supporting platform 0214 (photo Shire Project/Dil Singh Basanti).

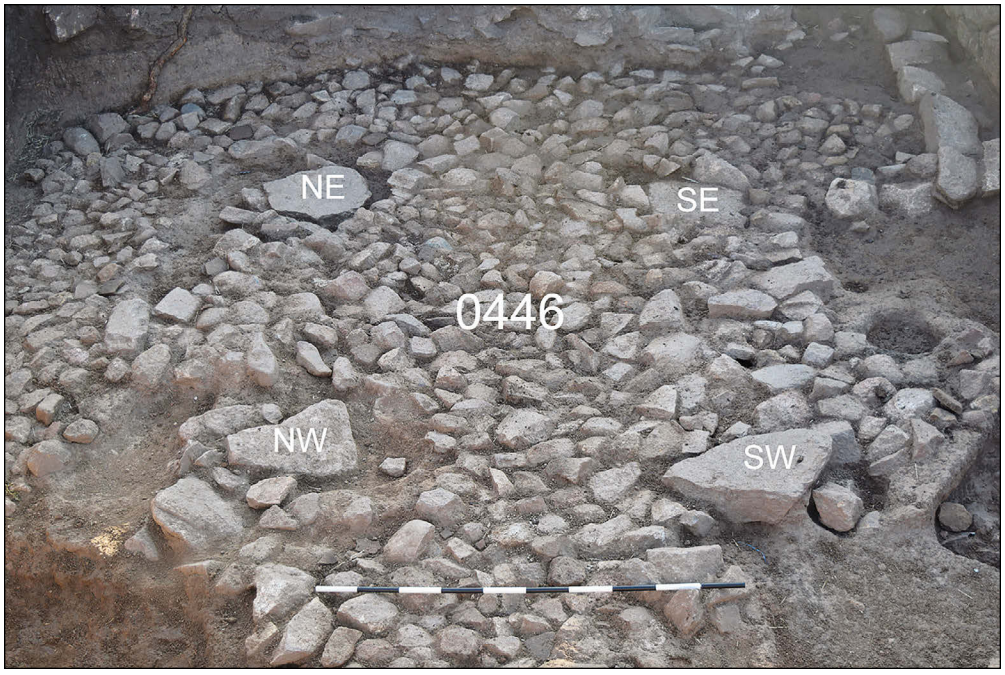

Fig. 13.12 – Trench MA02 looking west. Preparation layer for platform [0214] consisting of corner stones and a cobbled sub-surface (photo Shire Project/Dil Singh Basanti).

Fig. 13.13 – Platform [0214], looking east. The platform consists of a square outline, with a round feature on top, possible the remains of a substantial column, which would have had a diameter of approximately 1.50 m (photo Shire Project/Dil Singh Basanti).

phase was thwarted by adverse weather conditions. Unseasonable heavy rainfall limited the number of fieldwork days.

What we found were midden layers that demonstrated a period of abandonment after the original use of the space. All of these layers, which formed a laminated covering of the space dated to the 8th century BCE, showed signs of burning, to such an extent that it suggested that the middens had been on fire. Abandonment deposit (0466) could not be completely removed before the end of season, but seems to reflect residue from a yet-unexcavated occupation nearby. Finds from these midden deposits included multiple artifacts associated with complex craft activity, especially with copper/bronze metal working (a metal dagger, bead, metal knife, ring, etc.), a needle (sewing), two beads, worked stones (possibly in the shape of a bull's head), and several unusual ceramic forms, including basketry-impressed surfaces. These finds represent some of the earliest examples of complex crafting economies in the Horn of Africa and indicate the presence of metal working, weaving, possible basketry, and ceramic production in the earliest cultural horizons so far excavated at Mai Adrasha. An example of the high level of metal working is the knife found partly stuck inside wall [0455], partly in deposit (0466) (see Fig. 13.27).

Evidence for the second building phase included a north wall [0720], which was found only because of baulk collapse after heavy rainfall. This construction activity seemed to be

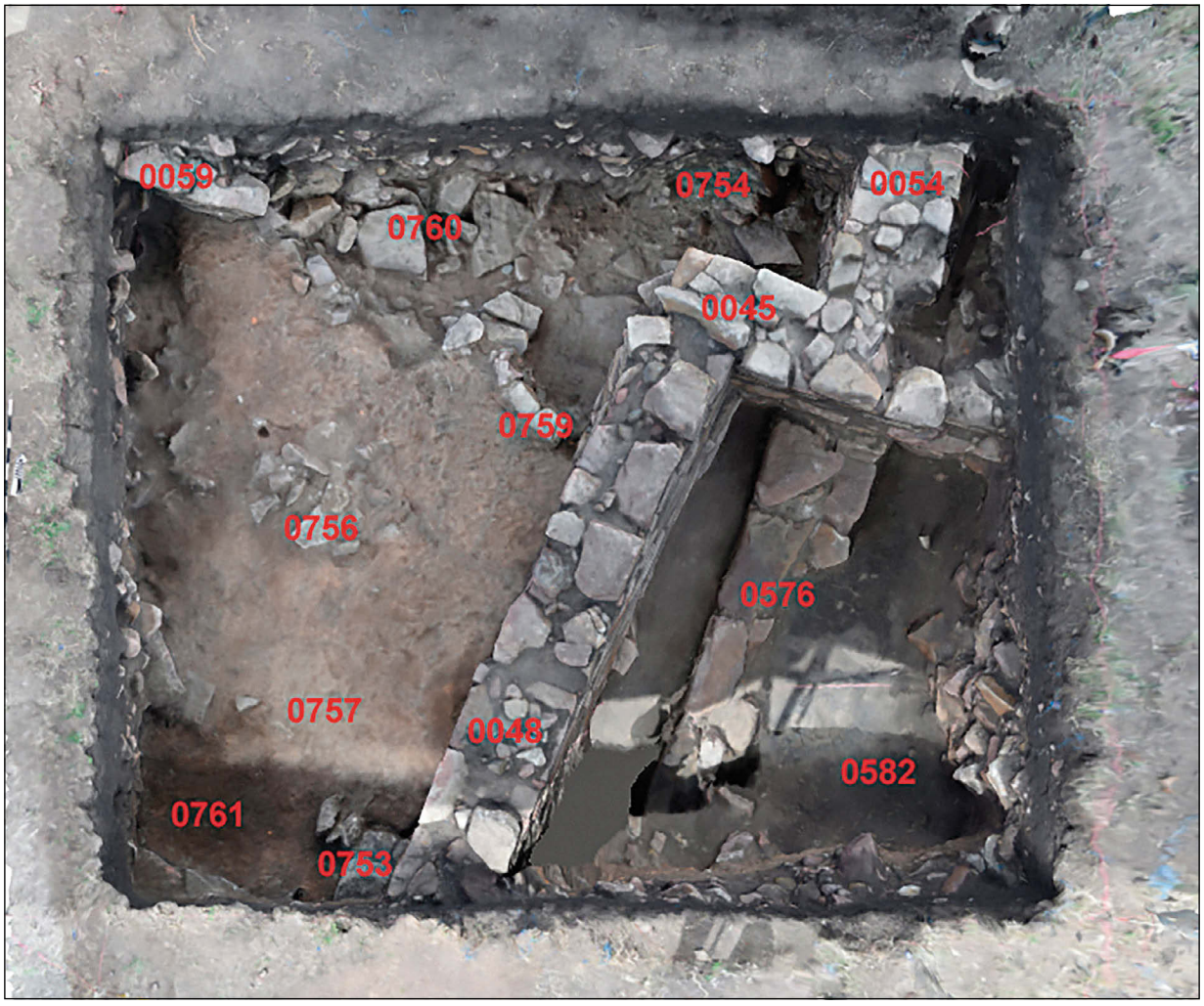

Fig. 13.14 – Trench MA03 (north is up), with the vestiges of walls [0760] and [0753] running approximately east-west and wall [0576] running north-south. Later walls [0059] is built over [0760], while [0054] follows the alignment of [0576]. The dark brown deposit (0761) overlies the oldest deposit (0757) which has not been excavated, but runs up to stone alignment [0759] (photo from 3D model, Shire Project/Alessia Brucato).

below part of a burn layer (0349), dated to the 8th-7th centuries BCE, but resting atop layers, including (0466), that also showed evidence of burning, suggesting that construction began while the middens had recently been, or still were in use, when these architectural features were built. This phase indicates the period of the most intense construction activity so far uncovered in MA02. Corner stone foundations (0555) and (0454) on walls [0457] and [0460] indicated the extent of where a square platform [0214] was to be built (Fig. 13.11). Walls [0224] and [0455] were established, prior to the creation of a foundation layer of cobble stones that supported the stone platform (Fig. 13.12). A large vessel (0456) was next placed and surrounded by this subsurface cobble pavement to buttress the cornerstone [0454]. The contents of this pot yielded several cultivated plant species: emmer wheat, barley, pulses (*fabaceae*) and *eragrostis* seeds (possibly teff), as did several other units in this trench.

After a small layer of earth floor/fill, the stone platform [0214] finally capped the construction. The placement of its original corner stones, multiple strata below the actual platform indicates the careful design of this architectural feature. The square platform had a central round outline which may indicate that the original purpose was support for a large internal stone column, supporting a roof.

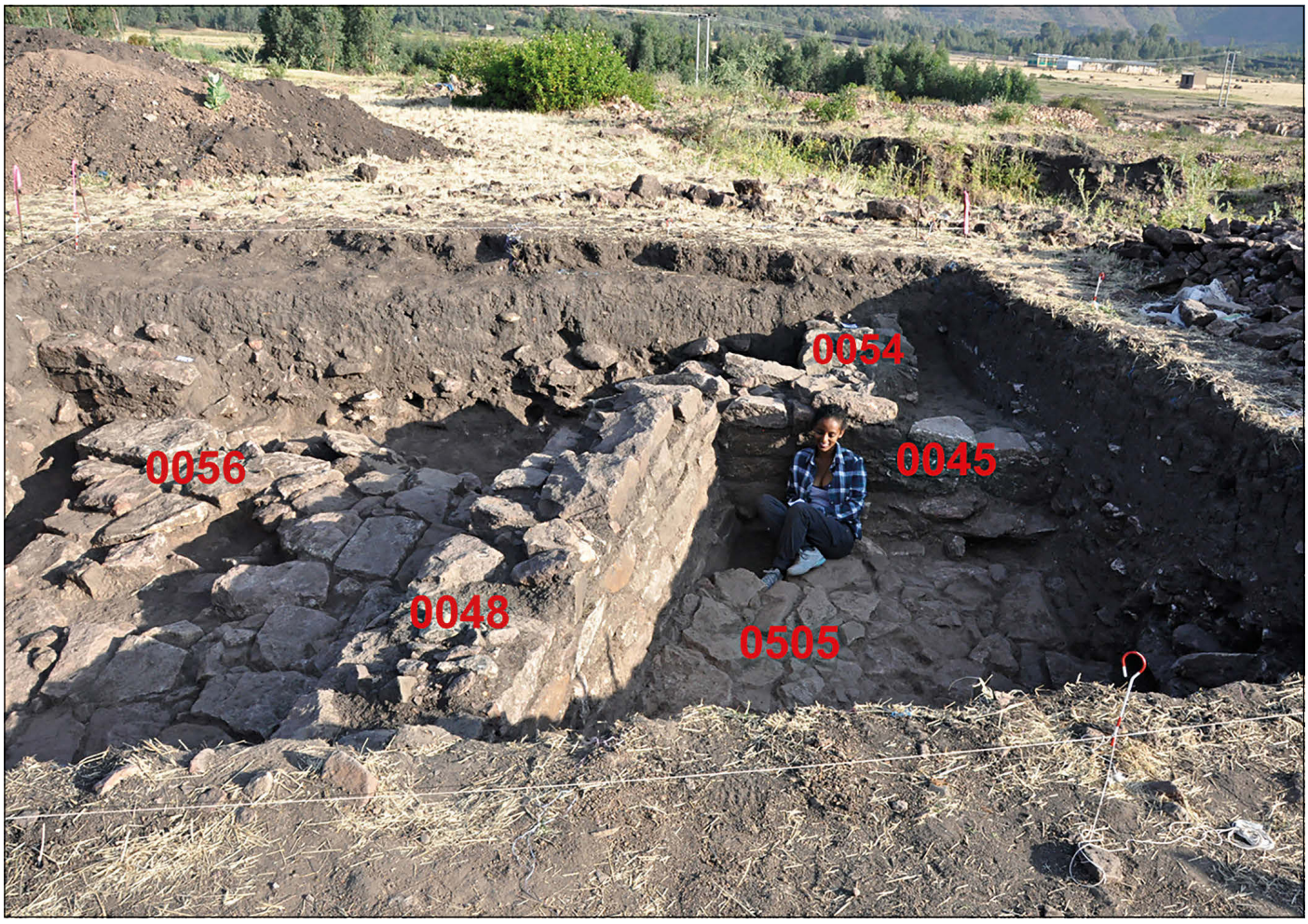

Fig. 13.15 – Trench MA03 looking north, with north-south walls [0048] and [0054] dividing outdoor pavement [0056] in the west and possible indoor or court yard pavement [0505] enclosed by walls [0048] and [0045] (photo Shire Project/Willeke Wendrich).

If the round traces on the platform indeed indicate the existence of a column, this was removed as part of the third building phase, which also included the construction of new walls [0091] and [0258] built on previous walls [0224] and [0455] respectively. An earthen floor was built up around the platform to level the area out as activity and storage space. The platform area in the middle of the room was used to support large storage jars. A radiocarbon date on charcoal underneath these vessels, but on top of the platform yielded the oldest date at Mai Adrasha, 12th-10th centuries BCE, but considering that the layers underneath all dated to the 8th century. BCE this date must be residual. North wall [0720] seems to have been an outer wall of the building, because of its size and the fact that the putative inner walls were not bonded with it.

Trench MA02 yielded the highest percentage of faunal remains based on Minimum Number of Elements (MNE) and Minimum Number of Individuals (MNI), which showed, in this as in the other trenches, a dependence on mammals, mostly domestic livestock identified as *Bos* sp. and caprine. Very few of these showed cut-marks (Janzen 2017).

5.3 Trench MA03 – Pre-Aksumite pavement and earlier walls

MA03 was the third trench started in 2015 at the edge of the destroyed area. Excavations were halted for a year in 2016, due to time limits of a short three-week season, and the

urgency to start trench MA04, but continued from 2017-2019, during which the trench was gradually expanded to a 6×6 m. area (Figs. 13.14-16).

The earliest phase in this trench is shown in Fig. 13.14 and was represented by a deposit (0757) in the western part of the trench between walls [0753] and [0760]. Wall [0760] were built with considerably larger stones than any of the later walls in this trench, but was similar to wall [0576] in the eastern part trench MA03. This substantial wall and a tumble layer, that seems to have come from a wall from the same period, were covered with a clay loam deposit layer (0754), on which the walls from a second Pre-Aksumite building phase, [0045], [0048] bonded with [0054], and [0059] were erected. This clay loam layer seems to have been deposited to even out the surface before the new building was erected. The wall-alignment that characterized the building phases in trench MA02 was also encountered here: the later building followed the outline of the older walls, which were (partly) used as foundation, even if the new space had a different lay-out. Dated to the Pre-Aksumite period a sample from unit (0582) produced evidence for barley, flax, grape, and a legume (Maurer 2019).

Not shown in the figures: in the east part of trench MA03, the first floor layer that was identified (0758) consisted of a thin deposit with frequent ceramic fragments. Underneath were several other occupation layers, fill layers and a foundation layer (0592) which supported a number of flat-lying stones (0594) and (0595) that may be part of a disturbed pavement, that would have been older than pavement [0056], which is indicated in Fig. 13.15. Above these isolated stones, which possibly were part of an older pavement, there are several levelling layers and floors east of wall [0048], forming a pattern of occupation or fill layers, such as (0578) underlying floor (0505). Fill (0578) revealed a wealth of archaeobotanical evidence for the presence of cultivars such as barley, finger millet and chickpeas.

All radiocarbon dates in this trench fall within at least two major Pre-Aksumite phases, ranging from the 11th to 5th centuries BCE. A very early date, 15th century BCE, was based on a charcoal sample, and was subsequently checked by dating a seed from the same context (0578). This seed and a charcoal sample from a deposit at the same level (0579), came out as dating to the 10th century BCE and the very early date may, therefore, be residual. This deposit in the eastern part of the trench was underlying and thus predating stone floor [0505] that was probably part of an internal space, bounded by north-south running wall [0048] and east-west wall [0045]. This well-dated context was overlying deposit (0582), which is visible in Fig. 13.14.

Fig. 13.16 – The better preserved copper alloy coin of king Armah (ca. 600-630 CE). An inscription in Ge'ez on the obvers, around the figure of the king holding a cross, says "King Armah. The reverse has a cross with a gold insert in the middle encircled by two wheat stalks with the inscription "Let there be joy to the people" (Munro-Hay 1999, p. 46, no. 582) (photo Shire Project/Vanessa Muros).

After bonded walls [0045], [0048], and [0054] were constructed, pavement [0056] was laid to its west. The pavement abuts wall [0045] just below the top three courses that remained of this wall. This extension of [0056] is quite regularly constructed and has a rather steep slope down to the south. In the center of this pavement a semi-circular area of missing stones seems to represent a deliberate cut. The occupational fill/debris layers that build up upon pavement [0056], are not shown in the illustrations. Occupation layer (0348) with pottery sherds, worked stone, metal fragments, and charcoal flakes, was dated to the 7th century BCE. A tumble layer above this (0342) and (0345), was made up of medium large cobbles concentrated along the western baulk, likely indicating a wall or architectural feature located outside trench MA03. This sediment, like all that above, was black, compact, and mostly argillaceous. The later fill layers show evidence of tumble and erosional layers that do not represents occupation after the Pre-Aksumite period. It is unclear whether this means that occupation in the Aksumite period, attested in other parts of the site, did not extend to this area, or whether Aksumite occupation layers were removed by agricultural activity. Trench MA03 is at a lower elevation than trenches MA01, 02 and 06, where Aksumite remains were found. Two Aksumite coins were found in the upper layers of trench MA03, one better preserved than the other, but both dated to the reign of king Armah, who ruled ca. 600-630 CE (Fig. 13.15).

Fig. 13.17 – Trench MA04 looking west. No correlation was found between the field boundaries and underlying structures. Deposit 0186 gave a date range in the third century BCE. The area east of wall [0184] consisted of a series of tumble layers (photo Shire Project/Willeke Wendrich).

The 7th century CE coins were found in fill layers (0337) and (0343) which were overlying a deposit that was dated almost a millennium earlier, to the sixth century BCE (0344). This date was consistent with a whole range of other early dates (including a 9th century BCE date) from layers at different elevations in this trench. P-XRF readings showed that the centre of the cross on the reverse side of both of the coins still had traces of gilding.

5.4 Trench MA04 – metal rings and late coffee

Trench MA04 was started in 2016, based on the theory that current field boundaries may reflect ancient structures (Figs. 13.17-19). During the 2015 excavation season a study of the edges of the destroyed areas showed that several large walls were aligned with the boundaries of agricultural fields owned by different persons. These boundaries are marked by substantial earthen ridges overgrown with bushes. The outline of the field boundaries as seen on satellite photography thus could perhaps indicate the lay-out of a very large architectural complex. In order to check the theory that the field boundaries coincided with substantial walls trench MA04 was positioned at the border of an agricultural field, sectioning one of the earthen ridges. In addition, the purpose of excavation was, as with the other trenches, to continue building a ceramic sequence upon well-stratified and well-dated contexts. Excavation showed that there were several walking surfaces and informal pathways between the fields on both sides of the ridge, but no architecture followed the ridge line. Instead several building and collapse phases could be discerned, which yielded dates ranging from the seventh century BCE

Fig. 13.18 – Trench MA04 looking east, with tumble layer (0235) and copper alloy rings against the east baulk within deposit (0233) (photo Shire Project/Willeke Wendrich).

(0186) in the area within walls [0178], [0179] and [0184], to the third century BCE, near the east baulk underneath tumble (0189) (see Fig. 13.17).

Within the tumble layers several coffee beans were found, in deposits (0185) and (0235), which were dated to the 19th century CE, but all the charcoal dates from these layers gave a seventh century BCE date and the coffee beans might have found their way through the tumble to the lower strata. Roasting coffee beans and making fresh coffee "from scratch" while farming is perhaps not done on a daily basis, but it certainly happened at times as a special treat while we were working in the field with our Ethiopian co-workers.

In unit (0235), we also found a small stack of copper alloy and iron ring shaped objects (see Fig. 13.18), which most likely also date to the seventh century BCE. The qualitative analysis of the five copper alloy rings or bangles revealed compositions similar to those found when they were analysed in 2017. Two of the bangles (SH16-001358-2 and SH16-001358-3) were made of a copper-zinc alloy with some lead. The other 3 bangles (SH16-001358-4, SH16-001358-5 and SH16-001358-6) which included 2 of the thicker bangles, were made of leaded bronze (Cu-Sn-Pb). The iron bangle was analysed as well to look at trace elements, in particular Ni, which could give an indication of the ore source (for example meteoric Fe can have high concentrations of Ni). However, the only prominent element found was Fe. Based on the shape of the copper alloy rod used for the bangles, it is clear that the material was cast in most of the objects as a square rod, and hammered to its rounded shape. In the case of SH16-001385-bd-4, a line, or seam was visible running along a section of the interior surface. This would suggest that this bangle was possibly made using a strip of Cu alloy that was folded and hammered to make the bangle. There seem to have been multiple manufacturing methods employed to make the bangles (Lehner 2017; Muros 2019).

In 2019 we decided to expand trench MA04 towards the north, because the trench had become too deep to safely work in and we needed to get a better idea of the building that was outlined by the walls in this trench. Trench MA08 was opened to investigate the extension of walls [0178] and [0184] in trench MA04 with a baulk of one meter wide between the two trenches. MA08 measured 6 meters on its east-west axis and 4 meters on its north-south axis. In trench MA04 only some work was done to clean the southeastern corner of the trench, which revealed the presence of what appeared as four pots crushed *in situ* at the upper layers of the trench. Three large clusters were discerned, registered and carefully packed away in the storage room for further study.

The western half of trench MA08 was occupied by a modern levelled field (0664) that was farmed by the local landowner.

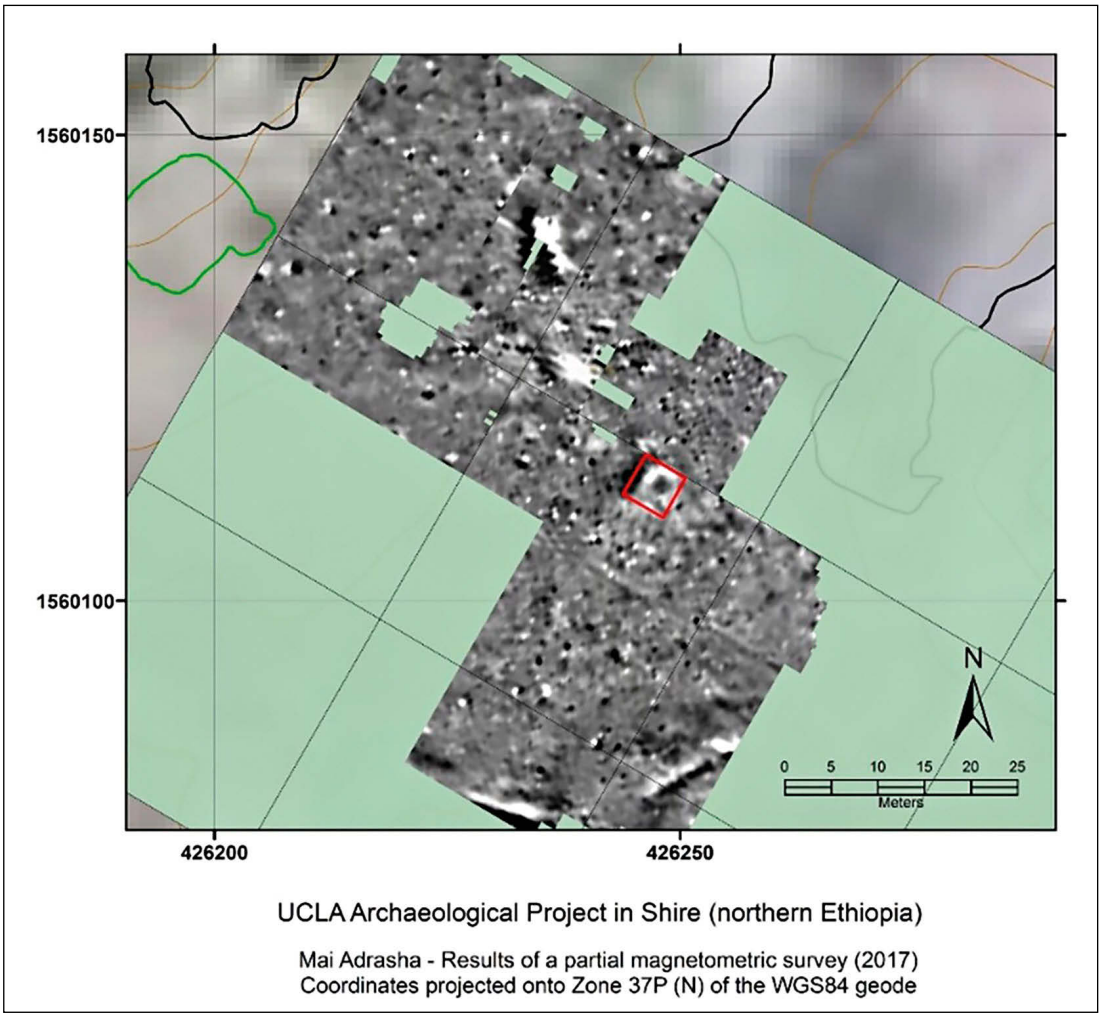

Fig. 13.19 – Part of the magnetometric map of the surface at Mai Adrasha and the location of Trench MA05 over one of the observed anomalies (Shire Project/ Katie Simon, Shire Project/ Christine Magnussen, Shire Project/ Hans Barnard).

Other than the removal of the vegetation and cobbles and some surface cleaning, that unit remained unexcavated. The main focus of the excavation of the trench, in 2019, was the mound covering the eastern half of the trench. The goal was to reach the level of (0664). It remains unclear how the units that were excavated relate to the current field, but the only unit for which a relationship could be determined was a pit cut <0748>. The eastern half of the trench included a ridge of stones and soil hidden underneath bushes that was used by the landowner to discard stones found in the agricultural fields and as borders between the lands of different owners. The excavation of the trench was halted for 4 days due to issues with the landowner, which resulted in a temporary shift of work to remove the backfill of trench MA04. Trench MA08 followed the pattern that was expected after excavating MA04, but due to protracted discussions with the landowner and the unseasonal rain we did not manage to get to a depth below the pathways and stone clearing of the adjacent agricultural fields.

5.5 Trench MA05 – anomalies and metal working waste

Topographic survey work in 2017 was mostly complimentary to other research projects. In November the grids used by a team of geophysical surveyors from SPARC (Arkansas) were located so that the results could be overlaid on existing maps and plans. The results of the magnetometric

survey that was performed were inconclusive, partly because many fields surrounding the site were not yet harvested and therefore inaccessible. In one place, south of the main site, a large circular anomaly was seen and a 5×5 excavation trench (Trench MA05) was opened to investigate this finding (Fig. 13.19). The trench was situated to expose the entirety of this anomaly, which appeared to be approximately 5m in diameter based on the survey results. The trench itself was near the south gate constructed in the fence erected after the previous project at Mai Adrasha in the mid-2000s. Two concrete pillars mark the location of the gate (see Fig. 13.5).

The anomaly was located in an area with a very thin layer of soil, with the bedrock between 70-100 cm below the surface. Most of the intact site deposits are approximately northwest of trench MA05, and are notably upslope from the trench. Runoff channels to the north and south of the trench suggest waterborne sediment and artifacts are likely to have been transported to this location. Trench MA05 was significantly lower in elevation than the other trenches at Mai Adrasha and in addition to its relationship to the site itself, the trench was situated approximately 100 m northwest and south of large expanses of bedrock. The trench was surrounded by teff fields and aligned slightly off true north to accommodate both the anomaly and a modern field boundary that runs roughly east-west along the north edge of the trench.

The primary goal of work in this trench was to test the effectiveness of magnetometry as a method for identifying architecture at Mai Adrasha and elsewhere. Secondary goals included identifying whether the previous project's site boundary was accurate in capturing the extent of the deposits, the depth and topography of bedrock underlying the site, the sequence of soil formation, the patterns of erosion impacting the site, and potentially the presence of occupation dating to periods before the introduction of ceramics at Mai Adrasha. Accomplishing these goals would have the effect of ground truthing the remote sensing method, refining understandings of taphonomy at the site generally, and potentially identifying the earliest deposits associated with occupation at Mai Adrasha.

The sequence of deposition in trench MA05 turned out to be mostly the result of natural erosion impacting Mai Adrasha, located upslope. There was no evidence for construction of field fences or other architectural features in the trench. No circular features of any kind were identified during excavation, nor was it possible to arrive at any strong explanations for the anomaly. Both the soil conditions and the local bedrock composition in the area below trench MA05 seem to have interfered with the survey results. Some metal was recovered during excavation, but they did not account for the large and well-defined anomaly present in the survey.

Yet MA05 is the one trench which provided evidence for copper and iron ores in units (0350, 0356, 0357, 0358, 0359, 0361). Smaller fragments of green ores were also noted in MA 05, however, a larger example (SH17-001732-gh) from MA05 unit (0358) is notably different. This example bears resemblance to a finer quartz matrix with copper oxides and possible sulphides. Quick qualitative scans with a Bruker Tracer 5i pXRF (40 keV 4uA) demonstrated the minor presence of lead and zinc, too, demonstrating the possible exploitation of polymetallic ores. It is presently unknown where these minerals come from, but larger copper sources in Eritrea are known (Lehner 2017).

5.6 Trench MA06 – Early Aksumite stamp seals over Pre-Aksumite modifications

Trench MA06 was opened in 2017, on a small spur of land that was left between illegal excavations to the north and the south. The large area that was excavated away to the south displayed a substantial wall (Fig. 13.20) and the profile in addition showed a stone pavement, covered by substantial deposits and a trash deposit underlaying both wall and pavement (Fig. 13.21). The purpose of excavations was to safeguard the information on the history of the structure represented by this wall and expose the inside of the structure.

The oldest remains related to trench MA06 consisted of trash deposit (0374) underlying wall [0372] and dated to the seventh century BCE. This predates wall [0372], as well as putative stone pavement [0445], neither of which were reached by excavations. The units overlying these were excavated as part of trench MA06 and showed at least four substantial changes in building phases ranging from the seventh to the third centuries BCE, with the top layers giving first century CE dates.

The final season reached a level with many organic remains, which may have been a dirt floor, on which two large stones were placed (Fig. 13.22). The organic fill underneath these two stones (0655) and (0651) both gave dates of the seventh century BCE.

Fig. 13.20 – The south face of wall [0372] was exposed in between the 2016 and 2017 excavation seasons. Trench MA06 is located at the left, straddling a small spur of land in between two major illegal excavations (photo Shire Project/Reuven Sinensky).

Fig. 13.21 – View of trash deposit (0374), underlying wall [0372], and putative pavement [0445] (photo Shire Project/Reuven Sinensky).

Fig. 13.22 – Trench MA06 (6×4 m), looking east. The two large flat stones seem to be *in situ* and perhaps originally functioned as column bases, within a space bordered on the south by wall [0372]. The soil concentrations underneath these stones were both dated to the seventh century BCE (photo Shire Project/Rinus Ormeling).

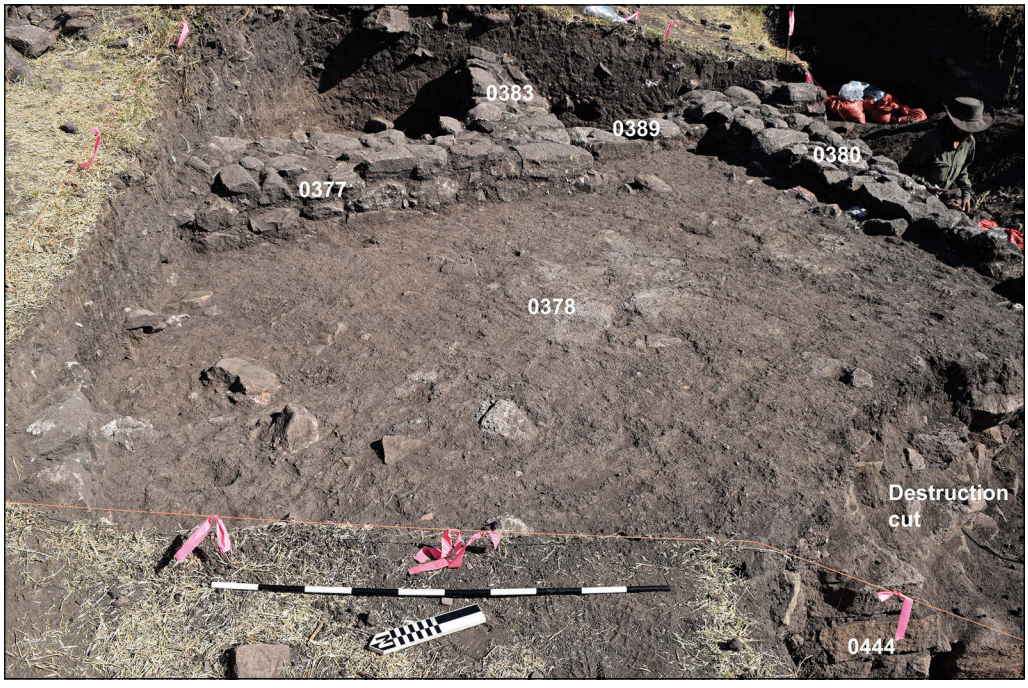

Fig. 13.23 – Trench MA06, third century BCE floor (0378) overlying earlier phases. Wall [0380] does not follow the line of underlying wall [0372], but runs at an angle of approximately 25 degrees (photo Shire Project/Reuven Sinensky).

The elevation of floor level (0683) was still a considerable height above the bottom of the large exposed wall [0372], which bonded with a north-south wall [0444], partly visible in Fig. 13.23. The level excavated in 2019 was dated to the seventh century BCE and did not reach the original use level of the space included in the latter two walls. Since the date of the trash deposit underneath wall [0372] also dated to the seventh century BCE, the modifications took place in a relatively short period of time. Two copper alloy rings were found along wall [0444] and are perhaps part of a foundation deposit. Above the use phase with the two large flat-lying stones several later phases with different wall configurations were excavated, mostly dated to the third century BCE (see Fig. 13.23).

Soil samples from several units dated to the third century BCE contained barley, emmer wheat and flax, while one sample from unit (0434), not shown in Fig. 13.23, contained a seed from *noog*, a plant native to Ethiopia and at present used for oil production (Maurer 2019). Several of the finds from the latest phase in this trench are known from Early Aksumite contexts from other sites, such as two fired clay seal stamps (Fig. 13.24). Parallels are known from Matara (Anfray 1967), Kidane Mehret (D. W. Phillipson 2000 fig 309c) Mangagebit and Ziban Adi (Benoist *et al.* 2021).

To understand the relationship between the later phase buildings in trench MA06 and the wall exposed by the large pit an additional trench, MA09, was planned to the east of MA06. There was just a sliver of land left, that would enable us to understand the relationships between the finds from the upper levels and the exposed wall [0372] and putative floor/pavement [0445] (Fig. 13.21). Conversation with one land-owner conveyed to us that this small part of land measuring approximately 3×4 m belonged to three persons. The prolonged negotiations took too long for us to be able to spend sufficient time to get to a meaningful result.

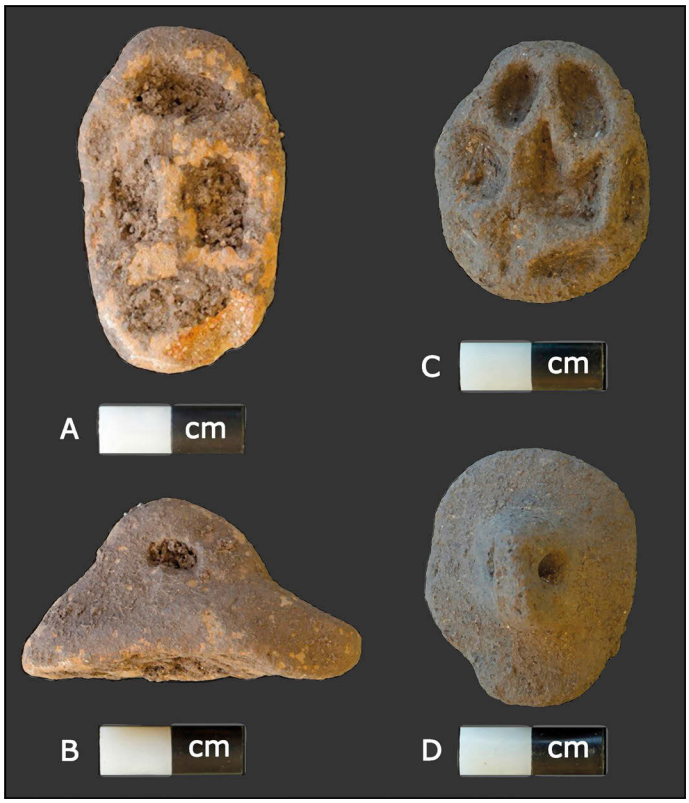

Fig. 13.24 – Fired clay seal stamps from contexts dated to the first century CE from the latest phase of trench MA06. A frontal view and B side view of stamp 1488-gj found in trash unit (0434); C frontal view and D upper view of seal stamp 2126-gj found in occupational deposit (0371) (photo Shire Project/Hans Barnard).

5.7 Trench MA07 – soil column

Trench MA07, was a 1×1 m trench at the edge of the destroyed area, that was used to get a deep stratigraphic sounding of the site. All levels of the trench were sampled for future flotation. A try-out in 2019 showed that preservation of botanical materials was very promising and the one sample that was checked with flotation yielded emmer wheat, barley and flax, as seen in many of the botanical samples from the other trenches.

Trench MA07 represented a long-term trash dump, capped by natural deposits, the collapse of architectural stone, and the use of the topsoil for teff cultivation. As a result, the trench yielded substantial amounts of material that was designed to contribute directly to evaluating the history of occupation at the site, and to connecting the sequence of use at the other trenches. While trench MA07 was somewhat far from the trenches at lower elevation (MA01-04), the depth of the excavations exceeded that of all other trenches at Mai Adrasha. Interestingly, although bedrock was only 70 cm underneath the surface at trench MA05, trench MA07 did not reach bedrock at the end of the 2019 season. It did cut through a large ash lens (0492), likely a hearth or hearth remains dumped in the area), yielded significant quantities of seeds and charcoal even in preliminary processing, and identified the first true sand deposits at the site, and encountered a pit below

Fig. 13.25 – Area of trench MA09 after removal of wild plant overgrowth, before start of excavation (photo Shire Project/Sarah Ricketts).

1912.00m ASL that was filled with large sherds of burnished and impressed blacktop wares.

The deepest stratum reached was (0498) and whatever is below it remained essentially unknown. A small sounding in the NW corner of the unit identified a dark black clay layer, but beside colour, depth and composition, no further detail about that deposit (0499) could be ascertained. Unit (0498) and units above, are clearly trash deposits from the very beginning. Into the earliest and sandiest deposit (0498), a pit <0496> was cut and with a single fill layer (0497) consisting of large sherds. Most of these strata were characterized by relatively large pot sherds, large quantities of charcoal and faunal remains, and very sparse lithic density. This pattern suggests repeated dumping of kitchen or food preparation debris of some kind, accumulating through time in the area of trench MA07. The upper, dry, deposits formed clearly definable layers, in nearly all cases in direct vertical orientation to each other, represented by the sequence: (0421)-(0429). The one exception was the substantial ash lens (0492), which was likely either a discrete dump event or a hearth feature. The soils at deeper elevations were extremely wet, however, and distinguishing whether they represented separate layers, unfortunately was not possible. Individual events cannot otherwise be discerned, though the accumulation of trash deposits such as these were undoubtedly the result of many small depositional events. The general uniformity of soil texture, and lack of significant non-artifactual inclusions in much of the sequence, makes distinguishing these events difficult.

Fig. 13.26 – Trench MA07 during excavation (photo Scott Sunnell/Shire Project).

At a first approximation, however, this suggests continual use of the site without interruption for a substantial amount of time. Above (0421), the strata become obviously natural, with a significant uptick in stone content (primarily pebbles and a layer of cobbles (0418). An exposed ash lense in the side of the illegal excavation (0420), was sampled, even it lay outside MA07. Above (0418), units (0417) and (0416) represent the topsoil composed of the contemporary ploughzone and active agricultural field.

Significant artifacts from trench MA07 were abundant. Notable finds were stone and bone beads, and bead fragments, a very large rim/shoulder sherd of blacktop ware at the top of pit fill (0497), and substantial amounts of charcoal throughout the trash deposits in the trench. Bone preservation in the lower strata was also excellent, with very large and frequently complete elements recovered. This trench had significant potential to yield plant materials for analysis, and to contribute substantially to our understanding of animal use as well. All of the primary goals of excavation for this trench were accomplished (reaching depth, identifying dateable plant materials, capturing a vertical sequence of site formation), except the possibility of reaching bedrock to establish the full depth of the site. Only two strata were put in for AMS dating, awaiting the 2020 season's study of the soil samples, so that botanical remains could be identified and dated. These were dated to the 6th century BCE (0491), overlying the ash dump, and the 3rd century BCE (0409).

6. Discussion

Excavations at Mai Adrasha revealed evidence for complex metal working dated to the 7th-5th centuries BCE and the 3rd century BCE. Other production types that may be attested are stone working, jewellery making, sewing, and perhaps basket making (evidenced by pot sherds with basket impressions). Ceramic use is widespread, but ceramic production has not been attested with certainty.

Pottery vessels are typically smoothed, while burnished vessels occur infrequently and these always have a black or red surface. Scraping, typically on the interior of pots, has been attested in all trenches. Red slipped ware occurs in nearly every stratigraphic unit, but in most cases it has been at least partially eroded. Common shapes include cups, small and large open bowls, pots with everted rims, necked jars, and large storage vessels. A number of nearly complete globular bowls have been found, with a diameter ranging from 10-20 cm, a ring base, a strap handle, and a nonfunctional moulded handle on the opposite side. Examples were found in MA01 and MA04 and this form is similar to that found in the excavations at Bieta Giyorgis. Nearly all the large storage jars were found in MA02, on top of the platform. These are large

pots with everted rims and a ring base, in a coarse orange to brown fabric. The diameters are all between 30 and 35cm. Sometimes they have nonfunctional moulded handles or other moulded decoration. Large open bowls were common in all trenches usually in an orange or brown fabric, but sometimes black topped. Occasionally examples in orange or brown fabric have a combed wave decoration just below the interior of the rim. Moulded, incised, impressed, and combed decorations all occur with some frequency.

The ceramic fabric types represented at Mai Adrasha have much in common with other archaeological sites in the highlands. Red orange fabric is by far the most common and ranges from a darker brown or red to a lighter orange or light brown. These changes in colour appear to result from differences in the firing process rather than significant differences in clay composition. An orange or pink exterior with a blue grayish interior found at some Pre-Aksumite sites, such as Seglamen, appears frequently, though slightly darker. Black, grey, and brown wares are also present, but in lesser quantities. Black topped vessels are frequently present in all trenches. Most fabrics are characterized by a large number of small white sub-rounded inclusions. Thin section analysis has shown these minerals to be quartz and feldspar. Biotite mica is also a frequent temper, especially in brown fabrics. Temper is usually large and frequent, while fine fabric is rare. All the trenches excavated have some similarities in their ceramic assemblages (Moy 2016, 2019).

The Mai Adrasha lithic assemblage can be discussed in terms of two parallel technological strategies; expedient to semi-structured flake production, and production of small blades as part of a "microlithic" formal tool component. These trajectories are largely, but not exclusively dependent on raw material. Orange-red cherts that are abundant locally as well as quartz cobbles were primarily used to produce expedient core types (typically radial or polyhedron core types), whereas higher quality chalcedonies were preferred for hierarchical microbladelet cores. There is some apparent variation (in terms of basic artifact inventory) between the trenches as Mai Adrasha. The most obvious difference is in terms of lithic density, with MA01 and MA06 having the greatest evidence of lithic reduction. Differences in proportions of cores, tools, and debris are also becoming apparent. In all trenches except for MA06, non-hierarchical core types outnumber hierarchical morphologies by at least 1.5:1 (in trench MA01 expedient cores at 4x as common). Trench MA06 however has

Fig. 13.27 – Copper alloy knife blade from trench MA02, units [0455] and (0466), dated to the 7th or 8th century BCE (photo Shire Project/Dil Singh Basanti/Vanessa Muros).

an even ratio of hierarchical to non-hierarchical forms, and a very low proportion of polyhedron type cores. Trench MA01 also has the greatest abundance of core modification flakes and flake debris by both count and weight, possibly suggesting a greater amount of in-situ core reduction relative to other trenches. Tools are common across most trenches, however the proportion of tools to cores and other debris is highest in trenches MA02 and MA03. It may be that these patterns reflect differences in tool production vs. tool use (or tool discard) areas within the site. Further details on context groups and proposed activity areas/ spaces generated from excavation will help elaborate these spatial relationships (Goldstein 2019). The overall technological industry is typical of the Later Stone Age of Eastern Africa, with higher proportions of a few formal tool morpho-types that appear to be specific to the Aksumite/Pre-Aksumite periods, such as the "Gudit" scraper described by Laurel Phillipson (2000).

The botanical samples are dominated by remains of agricultural crops, wild plant remains are underrepresented. The main focus is on barley, wheat and flax; crops which originated from the Middle East. However, the presence of local

domesticated crops, such as *noog*, tef and finger millet, are also tentatively demonstrated (Maurer 2019).

Most of the grinding stones have been found as part of wall-tumble or were observed to still be part of standing walls. The raw material for grinding stone production was primarily granite, a material that can be obtained locally in the nearby mountains. Most of the grinding tools are broken, with some of the fractures implying intentional destruction. Pecking traces on grinding stones are usually visible, suggesting re-roughening was carried out to make grinding stones more efficient after a certain time of use. Grinding traces (e.g. striations), indicating the backand forth movement of the grinding process in ancient Mai Adrasha, were characterized by deep striations on the stone surfaces, suggesting that considerable physical strength was applied during grinding. The grinding stones were not washed to enable sampling for starch grains (Li 2019).

The identifiable zooarchaeological specimens recovered from Mai Adrasha thus far point to an economy reliant primarily on cattle. Caprines comprise a very minor proportion of the faunal assemblage, as do wild ungulates. Other Pre-Aksumite or Aksumite assemblages show similar patterns in terms of faunal representation. Domestic livestock, particularly cattle, comprise the overwhelming majority of faunal remains at the Pre-Aksumite faunal assemblage from Mezber, situated in Eastern Tigrai (reported in D'Andrea *et al.* 2011). Avifauna at Mezber also comprise a very small portion of the assemblage, only 3% of the total Mezber NISP of 5192).

7. Conclusion

Through time drinking coffee in Berenike and Mai Adrasha is just one connection of many. Excavations at Berenike brought to light evidence of Aksumite contacts, such as coins and ceramics (Tomber 2007). The participation of the Kingdom of Aksum in the trade routes in the Indian Ocean, as well as the Red Sea is well-known (Tomber 2008; Darley 2024), and Berenike was one of the main harbours active from the third century BCE to the sixth century CE, which in its later phases evidenced close contact with Aksum.

The historical sources that outline the existence of the powerful Kingdom of Aksum, also show the close links of what at present is Ethiopia, Eritrea and Yemen. But what Mai Adrasha has shown is that beyond trade, there is a world to discover in how people lived in Northeast Africa before, during, and beyond such direct contacts. The term "Pre-Aksumite" reflects the dearth of knowledge on the archaeology of these areas. To term something as "pre" is like putting up a blank canvas that needs to be filled in. Attempts have been made to paint this canvas in one particular way: the Ethio-Sabaean kingdom of D'MT (*Daamat/Di'amat*), with its centres such as Yeha shows clear links with South Arabia (Fattovich 1990, 2009, 2010, 2019; Japp *et al.* 2011; Phillipson 2011). But a few kilometres away an indigenous "Pre-Aksumite" culture or cultures that are yet to be named, do not demonstrate such South-Arabian connections (Schmidt and Curtis 2001; D'Andrea *et al.* 2008). Eastern and Western Tigray abound in archaeological sites for which recent research has demonstrated an indigenous culture with similar subsistence strategies based on emmer wheat and barley, part of the cereals that were domesticated in the Near East, but also locally domesticated grasses, such as *Erigrosta*. Parellels in ceramics, lithics, metals and other industries exist, but the locations in the landscape are different. The midden deposits at Mai Adrasha have started to provide some semblance of identity that helps connect elements of the ancient culture with elements of society still important today. While oral traditions and modern cultural sentiment emphasizes the continuity of societies today with their ancient past, the archaeological excavations provide us with material evidence that can be used to bolster, refine, and clarify such claims.

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Ann B. Stahl

Marking the 70th anniversary of the Libyan-Italian archaeological Mission in the Tadrart Acacus and Messak, this volume offers a multidisciplinary reflection on Africa's deep past and its enduring legacies in the Anthropocene. By tracing the echoes of human-environment interactions across time, it highlights how archaeological research continues to reshape our understanding of adaptation, resilience, and transformation in African societies. Drawing on interdisciplinary approaches — including palaeoecology, bioarchaeology, rock art analysis, the archaeology of food production, and their various connections and networks — this book challenges outdated, Eurocentric narratives by foregrounding African agency and complexity. Key themes include – among others – the Holocene environmental changes that influenced settlement patterns, the significance of rock art in interpreting past belief systems, and the impact of colonial trade and imperial expansion on indigenous communities. *Echoes of Africa's Past* serves as a resource for archaeologists, historians, anthropologists, and heritage scholars, offering fresh perspectives on Africa's dynamic past and its relevance to debates on sustainability and cultural heritage in the Anthropocene.

«Archaeological knowledge is incremental and hard won. It is assembled through time-intensive study of fragmentary evidence and its corpus represents intergenerational effort. Though sometimes based on the study of stones, our interpretations are not written in them. Our working hypotheses typically run ahead of the evidence needed to assess them. Expanded investigations, new methods and changing premises compel revision and sometimes outright rejection of earlier ideas. Typological aids deemed useful by earlier generations may outlive their usefulness, at the same time as the evidence they organize remains pertinent and available for rethinking. The cumulative character of archaeological knowledge enables scalar perspectives across space and through time, casting what we know of one location in relief through comparison to others. These revisions, rethinkings and scalar reflections encourage us to appreciate the complexity and diversity of past contexts, as amply illustrated in contributions to this volume. In short, resuscitating echoes of Anthropocene Africa is painstaking work. In this way and others, archaeology is – and should be – slow science».

Ann B. Stahl, University of Victoria, BC, Canada

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This book is dedicated to the women and men of the Kel Tadrart, who have allowed us to work in their lands, guided us to hidden places, and shared their knowledge

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