

THE ROMAN 'AQABA PROJECT THE 1994 CAMPAIGN

by

S. Thomas Parker

Introduction

This report summarizes salient results of the first season of the Roman 'Aqaba Project (RAP). After some background, it turns to the project's goals and research design. The report then summarizes results from the project's excavation and regional survey. Finally, preliminary conclusions from this research are presented.

The first campaign was conducted from May 15 to July 6, 1994 under a permit granted by the Department of Antiquities. The project is sponsored by North Carolina State University and is affiliated with the American Schools of Oriental Research (ASOR) and the American Center of Oriental Research (ACOR). Principal funding for the 1994 season was provided by the National Endowment for the Humanities, an independent federal agency. Additional funding was provided by the National Geographic Society, Joukowsky Family Foundation, Samuel H. Kress Foundation, North Carolina State University, Kyle-Kelso Foundation, Institute of Classics of the University of Helsinki, IBM Corporation, and various private donors. Additional grants enabled four students to participate on the project. Elizabeth Ann Pollard Lisi and Elizabeth Stephens both received Jennifer C. Groot Fellowships in the Archaeology of Jordan. Kirsten Anderson received a fellowship from the Kyle-Kelso Foundation. Jennifer Blakeslee received a travel grant from the Endowment for Biblical Research. The author is grateful to all these agencies and individuals for their support.

Special thanks are due to Dr Safwan Tell, then Director-General of the Department of

Antiquities, Dr Fayez E. Khasawneh, President of the 'Aqaba Regional Authority, Dr Pierre Bikai, Director of ACOR, and Dr Donald Whitcomb of the University of Chicago. Their support is gratefully acknowledged.

The field team in 1994 consisted of 15 staff, 35 students, and 70 local Jordanians. Sawsan Fakhiry, Inspector of the 'Aqaba Region, served as representative of the Department of Antiquities. Senior staff included John Wilson Betlyon as Numismatist, Vincent Clark as Semitic Epigrapher, Dorianne Gould as pottery and small finds registrar, Nelson Harris as assistant camp manager, Janet Jones as glass specialist, Andrea Lain as human osteologist, Mary Mattocks as landscape architect and drafts person, Tina M. Niemi as geologist, Erick S. Parker as surveyor, S. Thomas Parker as director, stratigrapher, and ceramicist, Andrew M. Smith II as director of the survey, Michael P. Speidel as classical epigrapher and project advisor, Michelle Stevens as lithics specialist and survey archaeologist, Jonathan Tedder as photographer and videographer, Michael Toplyn as faunal analyst, and Peter Warnock as archaeobotanist and camp manager. Area supervisors were Vincent Clark (Areas C and L), Dorianne Gould (Areas E, F, H, O and K), Mary Louise Mussell (Areas D and J), Joanne Ryan (Areas B, G, and M), and James Terry (Area A).

Student staff serving as trench supervisors included Kirsten Anderson, Heather Beckman, Jennifer Blakeslee, Ghida El-Osman, Mark Friedrich, Susan Dana Gelb, Christopher Groves, Jane Ann Hanck, Shery Hardin, Nancy Hulbert, Bradley Kurtz, Anne

McClanan, Sarah Morgan, Matti Mustonen, Brian Overton, Charles Parker, Megan Perry, Elizabeth Ann Pollard Lisi, Christopher Port, Alexandra Retzleff, David Simpson, Elizabeth Stephens, Joseph Stumpf, Lennart Sundelin, Will Tally, Laurent Tholbecq, Mary Turner, Jan Vihonen, Brian A. Wade, Joel Walker, Kristi Jo Warren, and Michele Zaparanick. Marie Barnett and Mary Ann Schumpert were architect/surveyors. John Rucker served on the survey. Heather Beckman, Jennifer Blakeslee, and Elizabeth Ann Pollard Lisi were assistant registrars. Elizabeth Stephens supervised field processing of faunal and human osteological remains.

The Regional Environment

The project focuses on the region around the modern city of 'Aqaba, at the northern end of the Gulf of 'Aqaba (Fig. 1). The region lies within the great rift that extends southward through the Jordan Valley, Dead Sea, Wādī 'Arabah, Gulf of 'Aqaba, and beyond. 'Aqaba thus lies at the border between the southern end of Wādī 'Arabah and the northernmost extension of the Red Sea.

The contemporary climate is arid, with mean annual rainfall of 40 mm per annum confined to the winter months. It is also characterized by high temperatures, often exceeding 40 degrees C in summer. Despite the aridity of the region, fresh water is available through tapping groundwater just below ground surface. 'Aqaba is surrounded by deserts—Sinai to the west, Negev to the north, and Ḥismā in southern Jordan and northwestern Saudi Arabia to the north-east and east.

The coastal plain is ringed by mountains to the north-west and north-east, but lies open via Wādī 'Arabah to the north and is accessible via Wādī al-Yutum to the north-east. Steep gorges have been eroded into the mountains flanking Wādī 'Arabah by flash floods from torrential winter storms carrying sediment. At the mouths of these drainages

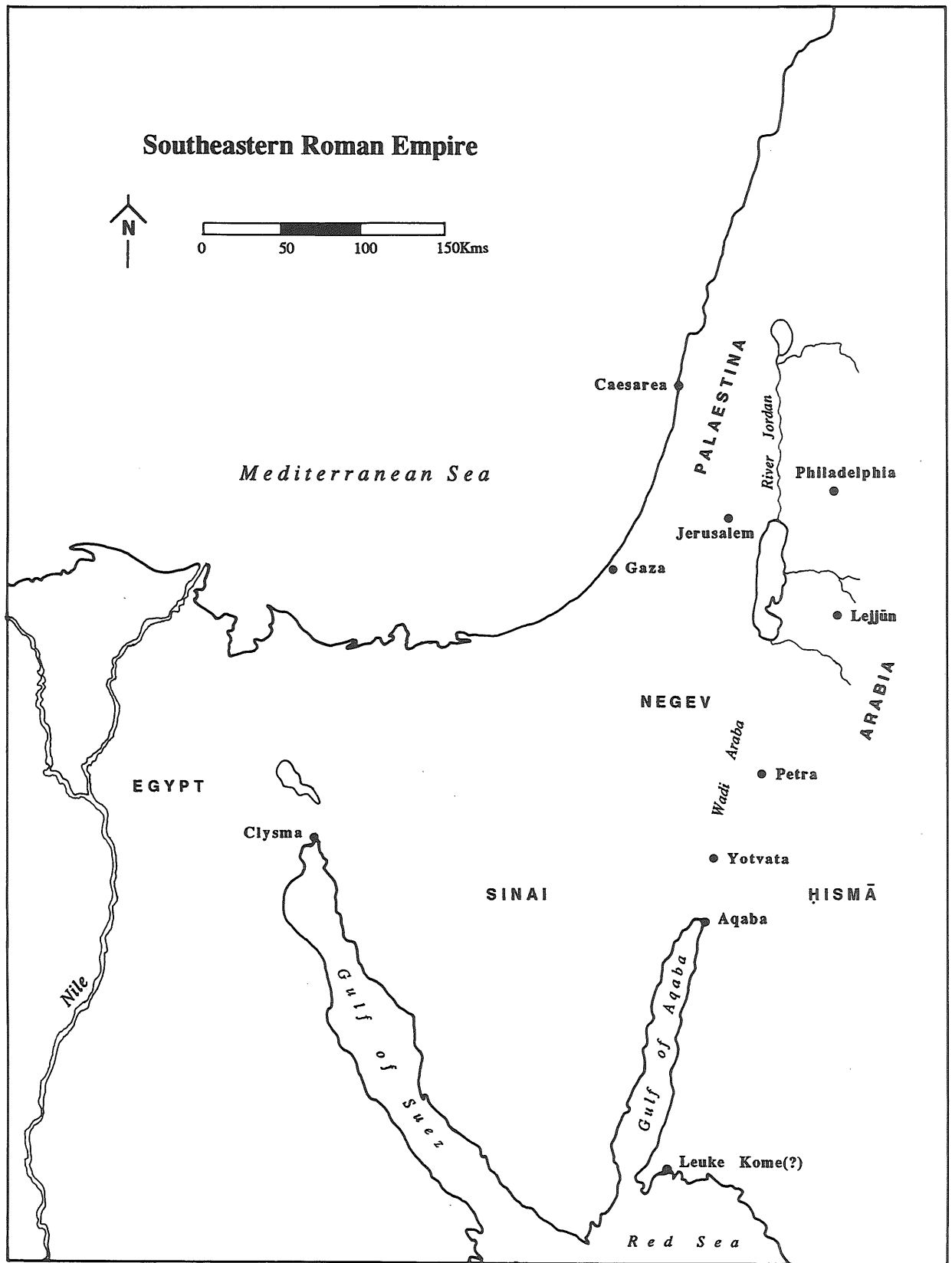
large alluvial fans have been formed by these accumulated sediments and radiate into Wādī 'Arabah, including around 'Aqaba. Modern flood control works divert run-off from the modern city of 'Aqaba, which is built largely on older alluvial sediments (Niemi 1995).

The site lies in an active tectonic zone and has experienced several earthquakes in historic times. Tectonic motion along the fault zone has subsided the valley floor and lifted the flanking mountains. The eastern mountains are Precambrian granites. Many igneous dikes, of varying composition from diabase to felsite, have cut through the granites. North of 'Aqaba and overlying the Precambrian granites are the so-called Nubian sandstones (Cambrian to Silurian). Erosion of these sandstones has created large dune fields in Wādī 'Arabah beginning ca 50 km north of 'Aqaba. The mountains west of 'Aqaba are composed largely of Cretaceous limestone, sandstone, and dolomite. The limestones are frequently interbedded with chert, shale, and phosphate. The valley floor extending to the gulf is covered with sediment derived from alluvial fans and mudflats. These sediments date from the Pleistocene to the Holocene (Niemi 1995).

Historical Sources

Numerous historical sources refer to Aila (Schertl 1936). Some of the more important are presented below. A variety of variant spellings is attested for the site in these sources, including Aila, Ailana, Aelana, Elana, Haila, Ailath, etc. For consistency in this and all subsequent reports, and by agreement with Donald Whitcomb, the Nabataean/Roman/Byzantine city will be referred to as "Aila". The adjacent Early Islamic walled town will be called "Ayla".

Diodorus (ca 60-30 BC), probably relying on earlier Hellenistic sources, mentions that around the coast of the Gulf of 'Aqaba "are many inhabited villages of Arabs who are known as Nabataeans. This tribe occupies a



1. Location map of 'Aqaba and Wādī 'Arabah.

large part of the coast and not a little of the country which stretches inland, and it has a people numerous beyond telling and flocks and herds in multitude beyond belief." He also states that these Nabataeans lived off their flocks but also preyed on merchant shipping in the Red Sea (Diodorus 3.43.4, Loeb transl.).

The most important early evidence on Aila is Strabo's *Geography*, from the early first century AD. Strabo confirms that the region was inhabited by Nabataean Arabs, who were pastoralists but also engaged in piracy until suppressed by Ptolemaic naval forces (*Geography* 16.4.18). His first explicit mention of Aila is in reference to its distance to Gaza, from which

is said to be an overland passage of 1,260 stadia to Aila, a city (Greek *polis*) situated near the head of the Arabian Gulf. This head consists of two recesses: one extending into the region near Arabia and Gaza, which is called Ailanites, after the city situated on it, and the other, extending to the region near Egypt... the overland journeys are made on camels through the desert and sandy places (*Geography* 16.2.30, Loeb transl.).

Elsewhere, describing the southern Arabian peninsula, Strabo mentions that frankincense, myrrh, and other aromatics from south Arabia were sold to merchants who arrive "in 70 days from Ailana (Ailana is a city on the other recess of the Arabian Gulf, the recess near Gaza called Ailanites, as I have said before)" (*Geography* 16.4.4).

Aila is also mentioned by the Elder Pliny (*NH* 5.12), Josephus (*AJ* 8.6.4 [8.163]), and Ptolemy (*Geography* 5.17.1).

Trajan's annexation of Nabataea in AD 106 as the Roman province of Arabia brought Aila under direct Roman rule. The *via nova Traiana*, which extended from the borders of the Roman province of Syria

through Arabia to its southern terminus at Aila, was completed between AD 111 and 114. Two milestones of the *via nova Traiana* have recently been discovered at 'Aqaba itself, dated 111/112 (MacAdam 1989: 172).

The partition of provincial Arabia by Diocletian (284-305) transferred southern Transjordan, including Aila, to the province of *Palaestina*. Several Late Roman and Byzantine sources provide important details about the city. Eusebius, ca 290, mentions that Aila was located on the outer borders of Palestine, that commercial traffic from India and Egypt passed through Aila, and that *legio X Freten-sis* (formerly based at Jerusalem) was then garrisoned at Aila (*Onomast.* 6.17-21). A fragmentary monumental Latin building inscription of ca 317-326, discovered in the early Islamic town, may reflect the legion's presence at Aila (MacAdam 1989). The legion was posted at Aila until at least the turn of the fifth century (*Notitia Dignitatum Or.* 34.30).

The Peutinger Table, a Late Roman road map, shows Aila (Haila) at the junction of several important land routes: one north through the Negev into Palestine, another basically following the *via nova Traiana* northeast into Transjordan, and a third westward across southern Sinai towards Egypt.

The first literary evidence of Christianity at Aila is attested in 325, when a bishop of Aila attended the Council of Nicaea. Later bishops are listed at church councils in 451 and 536 (Abel 1967: v.2, 201). Another bishop of Aila from the early seventh century is attested among the Nessana papyri in the Negev (Kraemer 1958: 146, no. 51). A Christian Greek epitaph dated 555 has also been reported at 'Aqaba (Schwabe 1953).

Procopius of Caesarea (late sixth century) mentions Aila as a city on the shore of the Red Sea at the head of a narrow gulf (i.e. the Gulf of Aqaba; *B. P.* 1.19.3, cf. 1.19.19). He states that Roman vessels sailed from Aila into the Red Sea (1.19.23). Aila is also mentioned by several other Byzantine writers,

some of whom describe the city as a station for pilgrims en route to Mount Sinai. One such pilgrim, ca AD 570, states that “from Mount Sinai it is eight staging posts to Arabia, and the city called Aila. Shipping from India comes into a port at Aila, bringing a variety of spices” (Antoninus Placentius, # 9, *CCSL* 175: 149). The architect who designed St. Catherine’s monastery at Mount Sinai in the mid-sixth century is described in an inscription as “Stephanus, son of Martyrios, builder and architect of Aila” (Sevcenco 1966: 257, 262, no. 3).

Muslim rule over Aila began in 630, when Yuhanna ibn Ru’ba, perhaps the bishop of Aila, negotiated its surrender at Tabuk with the Prophet Muhammed himself. Of special note is the guarantee offered by the Prophet for the protection of Aila’s ships and caravans on land and sea (Zayadine 1994: 499), suggesting continued importance of commerce in Aila’s economy on the eve of the Muslim invasion. Soon after, ca 650, the Muslim founded a new fortified town less than 1 km to the south-east. Recent excavations have revealed that this Early Islamic town flourished from the mid-seventh to early thirteenth centuries AD (Whitcomb 1986, 1987, 1988a, 1988b, 1989a, 1989b, 1989c, 1993, 1994, 1995). A suggestion that the walled Early Islamic town represents the reused Roman legionary fortress of *legio X Fretensis* (Knauf and Brooker 1988) has rightly been rejected (Whitcomb 1990).

The Arab geographer Shams ad-Din Muqaddasi visited Early Islamic Ayla in the tenth century AD and reported that the city “is usually called Ayla, but [the true] Ayla is in ruins nearby, about which it is written ‘Ask them concerning the town by the sea.’” (Khoury and Whitcomb 1988: 11). It has reasonably been supposed that Muqaddasi was looking from the Early Islamic town northwest to the ruins of the Roman and Byzantine town, by then abandoned and in ruins (Khoury and Whitcomb 1988: 12). As seen below, new evidence from the current pro-

ject supports this interpretation. A fifteenth century Arab chronicler, al-Maqrizi, mentions an arched gate just outside Ayla that he attributes to the Romans (Zayadine 1994: 488).

The early Islamic town was abandoned in the early thirteenth century AD. A new settlement appeared ca 1 km farther south down the coast around the present Hashemite castle. This Late Islamic settlement included the castle (as a caravan station), date palm plantations, and fishing village reported by various travellers (Khoury 1988: 140-41; Whitcomb 1994: 7; Zayadine 1994: 501).

Previous Research

The region of ‘Aqaba was until recently little known archaeologically. Some useful information may be gleaned from travelers who visited the site in the nineteenth and twentieth centuries and from prior scholarly research in the region.

Among the earliest travelers to visit ‘Aqaba was Eduard Rüppell in 1822, who reported seeing ruins called Gelena (Rüppell 1829: 248ff). He was followed by Leon de Laborde in 1828 (Laborde 1836: 45). Edward Robinson reached ‘Aqaba from Sinai in April, 1838. As he traveled around the northeastern head of the gulf he reported that “the extensive mounds of rubbish, which mark the site of Ailah, the Elath of Scripture, were on our left. They present nothing of interest, except as indicating that a very ancient city has here utterly perished.” (Robinson 1841: 241). Other early visitors included E. Joy Morris in 1840, who also saw mounds of ruins on the edge of the sea (Morris 1842: 262).

One important early visitor was Richard Burton, who reached ‘Aqaba by sea in 1878:

Inland and to the north rise the mounds and tumuli, the sole remains of ancient Elath, once the port of Petra, which is distant only two dromedary marches. During rain-floods the site is an island:

to the west flows the surface-water of the Wady el-‘Arabah, and eastward the drainage of the Wady Yitm has dug a well defined bed. A line of larger heaps to the north shows where, according to the people, ran the city wall: finding it thickly strewn with scoriae, old and new, I decided this was the *Siyághah* or “smith’s quarters.” Between it and the sea surface is scattered with glass, shards, and slag (Burton 1879: 240).

Among several valuable observations are the supposed line of a city wall on the northern side of the site and the quantity of slag and “scoriae” on the surface. Also notable is Burton’s remark about problems posed by surface water flowing around the site. He later notes that the locals had constructed earthen dams to divert water away from the town and its date palm plantation (Burton 1879: 241). Morris, Burton, and Charles Doughty, who visited ‘Aqaba ca 1876, all reported seeing a wall or crude masonry dam built across the mouth of Wādi al-Lithm (i.e. Wādi al-Yutum; Morris 1842: 265; Burton 1879: 241; Doughty 1936: 84-85).

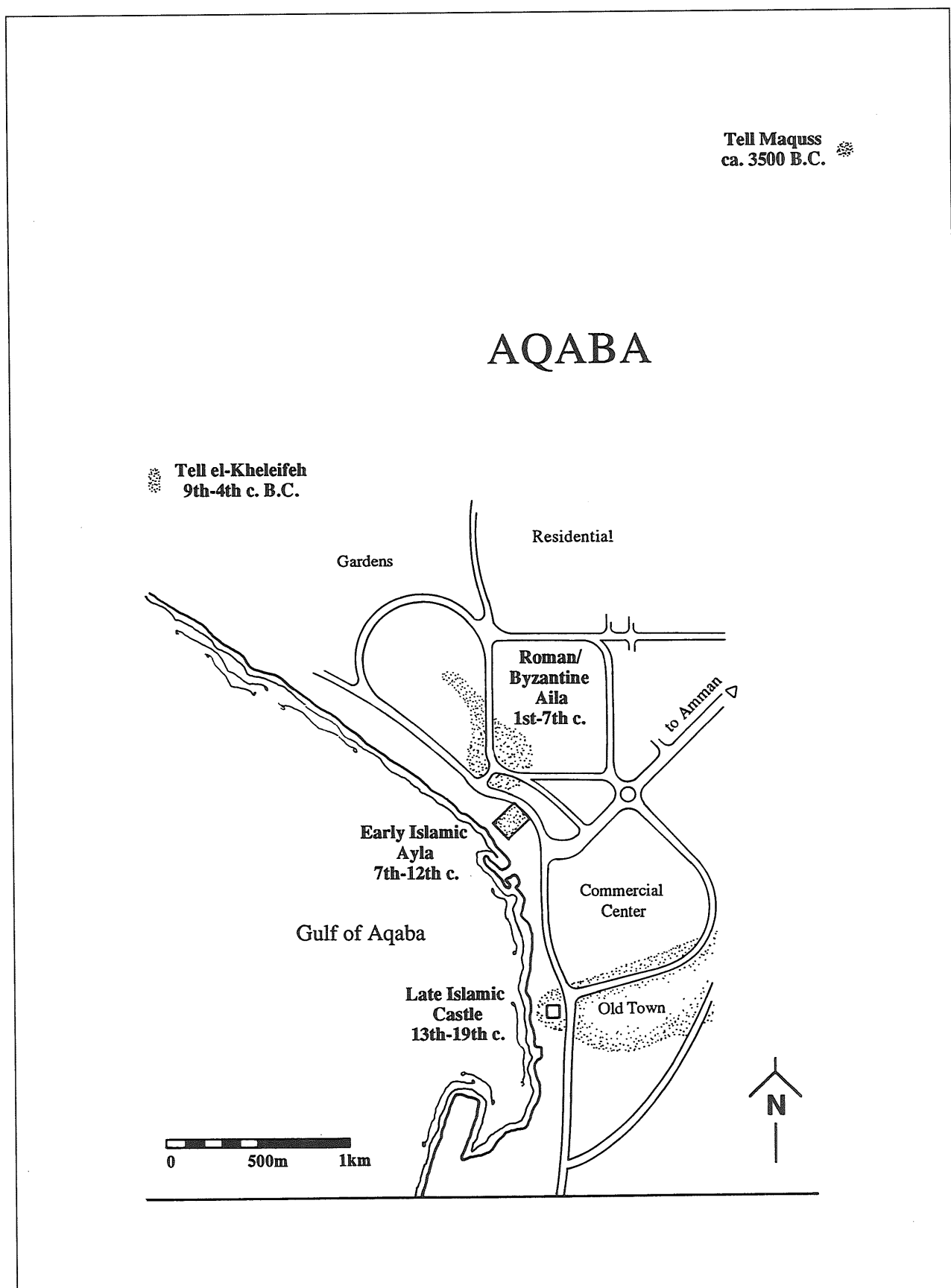
T. E. Lawrence visited ‘Aqaba in 1913. He suggested that visible surface ruins and scattered artifacts represented “an Arab settlement of some luxury in the early Middle Ages” (Woolley and Lawrence 1936: 144). It now seems clear that he correctly located the Early Islamic settlement of Ayla. Of special interest is his observation that “There are remains a little farther inland, and these represent probably a small village outside the gates of the larger place.” (Woolley and Lawrence 1936: 144). Recent work now suggests that these remains are in fact the classical Aila.

Fritz Frank visited the region during his survey of Wādi ‘Arabah in 1933. He apparently was the first scholar to notice the low-lying mound of Tall al-Khalayfi, located 550 m north of the modern shoreline, ca 2 km NW of Aila and ca 3.5 km NW of the Late Is-

lamic castle at ‘Aqaba (Fig. 2). He suggested that Tall al-Khalayfi, which seemed to be of pre-classical date from its surface pottery, was in fact Solomon’s port of Elath/Ezion-geber (Frank 1934: 243-45).

Nelson Glueck surveyed the region in 1934 and 1936, then conducted extensive excavations at Tall al-Khalayfi in 1938-1940. During his initial visit to ‘Aqaba he noted that “About a kilometre west-northwest of ‘Aqabah (i.e. the late Islamic castle) we came upon a very large site, thickly strewn with sherds, which has been correctly identified with the Roman Aila. The site was, however, originally Nabataean, being covered with large quantities of Nabataean sherds of all kinds. In addition there were large quantities of Roman, Byzantine, and mediaeval Arabic sherds. Some fragments of glass were found, which are probably Roman in origin....No sherds earlier than Nabataean were found at Aila.” (Glueck 1935: 46-47). A second visit in 1936 confirmed the absence of pre-classical pottery from the site. He also recorded two Byzantine capitals with bas-reliefs recently found at ‘Aqaba, perhaps from a Byzantine church. Greek inscriptions carved over each warrior-saint identified them as St. Theodore and St. Longinus (Glueck 1939: 1-3).

Glueck’s excavation of Tall al-Khalayfi yielded valuable evidence of the Iron II and Persian periods. He initially dated the foundation of the site to the tenth century BC and accepted Frank’s identification with Biblical Elath/Ezion-geber. Finds of imported Greek pottery and Aramaic *ostraca* pushed the *terminus* of occupation into the fourth century BC. Although he reported a “few Nabataean sherds” from the surface of the site (Glueck 1939a: 3), no evidence of Nabataean occupation or artifacts was ever reported from the excavations. He also stressed the importance of copper-processing in the site’s economy. Glueck produced a fine record of published preliminary reports (Glueck 1935; 1938a; 1938b; 1939a; 1939b; 1940), but no final re-



2. Map of the modern city of 'Aqaba, with ancient and Medieval archaeological sites .

port appeared before his death. In his last published statement about the site in 1965, Glueck expressed some caution about his initial interpretations but continued to assert that Tall al-Khalayfi could have been Elath/Ezion-geber or at least was “a fortified industrial, maritime, storage and caravanserai for both.” (Glueck 1965: 71).

A recent reappraisal of Glueck’s work has cast doubt on his proposed identification of Tall al-Khalayfi as Solomon’s port of Elath/Ezion-geber. Pratico’s reinterpretation of the pottery now suggests occupation no earlier than the eighth century BC and continuing into the fifth or perhaps fourth century BC (Pratico 1993). A stamped Rhodian jar handle of ca 200 BC, a surface find, is the only published evidence for later occupation (Pratico 1993: 62).

Aurel Stein visited ‘Aqaba in April, 1939. He noted that the “ancient name of Aila clings to a mound stretching for about half a mile [ca 800 m] at a short distance from the northern extremity of the Gulf of ‘Aqaba.... The mound bears on its sandy surface an abundance of sherds which have enabled earlier visitors of archaeological competence to determine occupation of the site from the Nabataean and Roman periods down to mediaeval times.” (Gregory and Kennedy 1985: 304).

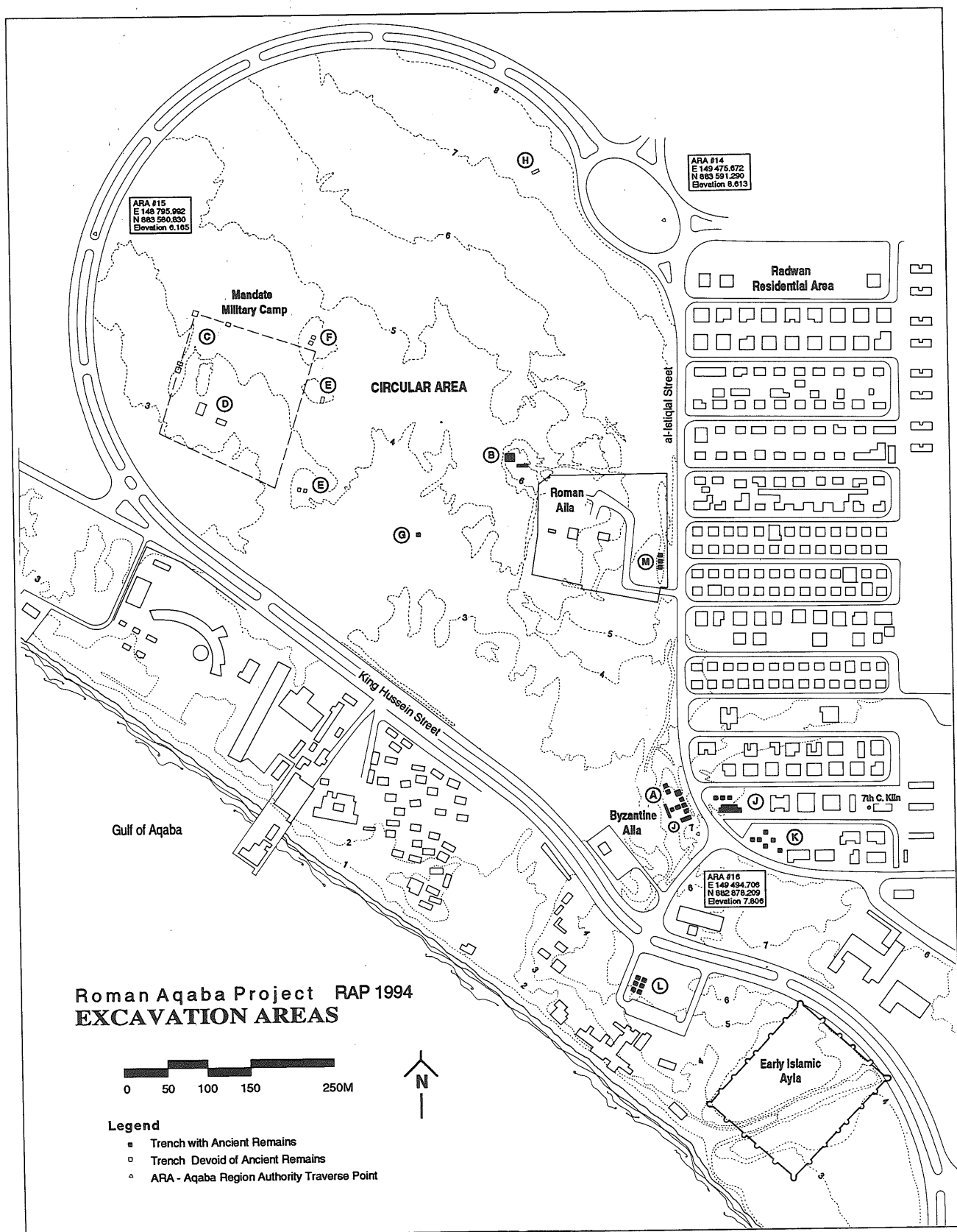
With the site of Aila seemingly well located by these early visitors, it seems surprising that its exact location was soon lost. Only a few years after Stein’s visit, Kirkbride and Harding visited the modern site known as “Aileh” and reported no sherds of the classical period. Further, they inspected a section of the site excavated to its lowest stratum by modern construction activity and claimed that this showed the site was no earlier than Byzantine (Kirkbride and Harding 1947: 24). The first archaeological excavation of ‘Aqaba was conducted in 1954 by Salim Saad, apparently just east of the present ‘Aqaba Hotel. He “uncovered what was thought to be a section of a city rampart, along

with Nabataean lamps and pottery sherds.” (Khoury 1988: 138). Unfortunately, both the artifacts and report of this work were shortly thereafter lost, and nothing was ever published (pers. comm. from Salim Saad).

The post-World War II era witnessed explosive growth of ‘Aqaba as Jordan’s only seaport and a tourist resort. Modern ‘Aqaba rapidly expanded from its old center around the Late Islamic castle northward over the archaeological site (Fig. 2). By the 1980’s it could truthfully be stated that “The site of Roman Aila is unknown.” (Gregory and Kennedy 1985: 429).

Although the precise location of the classical Aila was now a mystery, new excavations in the 1980s revealed important pre-classical and post-classical sites. In 1985 Khalil excavated Tall al-Maqass, a small mound ca 4 km north of the present coastline near the modern airport (Fig. 2). The site, dated to the mid-fourth millennium BC, yielded evidence of copper-working (Khalil 1987; 1992). Rediscovery of Early Islamic Aila began in 1986, when Whitcomb located a rectangular walled town on the beach, apparently founded in the mid-seventh century AD (Figs. 2 and 3). These results and scattered literary references suggested a port that flourished until the early thirteenth century (Whitcomb 1986, 1987, 1988, 1989a, 1989b, 1989c, 1993, 1994, 1995; Khouri and Whitcomb 1988; Melkawi, ‘Amr and Whitcomb 1994). Although these excavations yielded quantities of pre-Islamic artifacts mixed with later material, no stratified remains antedating the seventh century were found. Among these were fragments of a Latin building inscription of AD 317-326 (MacAdam 1989) and a Byzantine lintel inscribed with Christian symbols and a Christian Greek inscription (Zayadine 1994: 489). All this hinted strongly that pre-Islamic Aila must lie nearby.

Suggestions about the location of pre-Islamic Aila were advanced from a surface survey by Meloy in 1990. He surveyed the



3. Map showing location of all areas excavated by the Roman Aqaba Project in 1994.

region north-west of the Early Islamic town. This is a largely flat-lying area now covered by modern buildings and sand dunes lying within 500 m of the modern shoreline. The portion within the modern ring road, designated the Circular Area, encompasses about 40 ha. Here Meloy identified several mounds, traces of mudbrick walls and scatters of surface artifacts. Surface pottery, mostly dated from the first century BC to the sixth century AD, suggested that this area could have been part of classical Aila (Meloy 1991). The survey and the encouragement of Donald Whitcomb encouraged the author to excavate in this sector to find classical Aila.

Principal Research Questions

The project seeks to answer the following principal question: what was the role of the city of Aila in the economy of the Roman Empire and how did this role evolve over the centuries of the city's existence ?

From this primary question, several subsidiary research questions may be grouped into three major categories:

1. What was Aila's role in international trade between the Roman Empire and its eastern neighbors? What specific products passed through the port? Where were their origins and destinations? What structures were developed at the site to facilitate this trade? What were the principal routes of access ?
2. What was the impact of the regional natural environment on the economy of the city? Conversely, how did human activity impact the regional environment? Most Roman cities controlled a *territorium*, that is a rural hinterland that provided agricultural and raw materials. Was Aila's hinterland adequate for self-sufficiency in various necessities, or was some level of importation necessary ?
3. How was economic and other human activity organized within and around the urban space ? How did the physical plan of

the city evolve ? Can areas of specific activities be identified, such as residential districts, industrial areas, commercial districts, caravanserais, harbor installations, cultic buildings, and military quarters ?

Research Design

In order to answer these questions, the project's research design consists of two major components: 1) a regional archaeological and environmental survey of the environs of 'Aqaba, focusing especially on Wādī 'Arabah north of the city, which is largely *terra incognita*, and 2) excavation of the classical city in order to learn about its plan and history and to recover artifactual material for analysis. A preliminary reconnaissance was conducted in 1993 to study the site and formulate the research design; a reconnaissance of southeastern Wādī 'Arabah evaluated prospects for a full-fledged archaeological survey (Smith and Niemi 1994). The results were sufficiently encouraging to plan the current project, which launched the first of three planned field seasons in 1994.

The Regional Survey

A major gap in our knowledge of the environs of 'Aqaba is southeastern Wādī 'Arabah, which offers the easiest access to the site from the north. The region was thus targeted for survey by the project. Wādī 'Arabah is a linear valley that extends ca 165 km north from 'Aqaba on the Red Sea to the escarpment overlooking the Dead Sea. The south-east sector of the valley, that is the study region, extends ca 70 km NNE from 'Aqaba to the watershed of the 'Arabah valley, ca 12 km north of al-Gharandal.

The primary goal of the survey is to explore both the hinterland of the city of Aila and one of the city's presumed principal land routes. The survey team is studying the natural environment (geomorphology, hydrology, climate, flora, and fauna) and recording evidence for past human activity by visiting

previously known archaeological sites and searching for new sites. Although the focus of the project is the classical period, sites of all periods encountered were recorded.

A total of 161 archaeological sites were visited and recorded by the survey team in 1994. The principal periods represented in preliminary analysis of the collected artifacts were Middle Paleolithic, Pre-Pottery Neolithic B (PPNB), Chalcolithic/Early Bronze, Early Roman/Nabataean, Late Roman, and Early Byzantine. There was more limited evidence of occupation in the Late Byzantine and Early Islamic periods. Detailed results of the survey are forthcoming in a separate article.

Excavation of Aila

Based on Meloy's 1990 survey, excavation initially focused on the so-called Circular Area, believed to encompass part of classical Aila (Fig. 3). The sheer size of the Circular Area necessitated sampling selected areas. Selection of excavation areas was determined by analysis of aerial photographs, traces of architectural remains visible on the surface, and scatters of surface artifacts. Nine widely scattered excavation areas (Areas A-H, M) were laid out to sample the Circular Area. As will be seen below, three areas (A, B, and M) closest to al-Istiklāl Street immediately came upon significant ancient remains and will be discussed below. Results from the other excavation areas were negative in terms of ancient remains but yield important evidence on the geomorphology of the region. These will be discussed first.

Areas C, D, E, F, G, and H. Meloy noted several mounds of sand and palm trees close together within the Circular Area. Several surface features suggested the possibility of ancient occupation. Diagnostic sherds dated largely from the first century BC to the fourth century AD. Therefore the project opened six excavation areas, each of one to three trenches, designated Areas C, D, E, F,

G, and H (Fig.3).

Several wall lines of mudbrick visible on the surface in Areas C and D dated to the mid-twentieth century and probably represent a British military camp. In Areas E, F, and H no ancient remains were found under topsoil. In Area G a deposit of mudbrick slump, presumably from some kind of structure nearby, was found atop sterile sand. But no visible structures appeared and only a few artifacts were recovered.

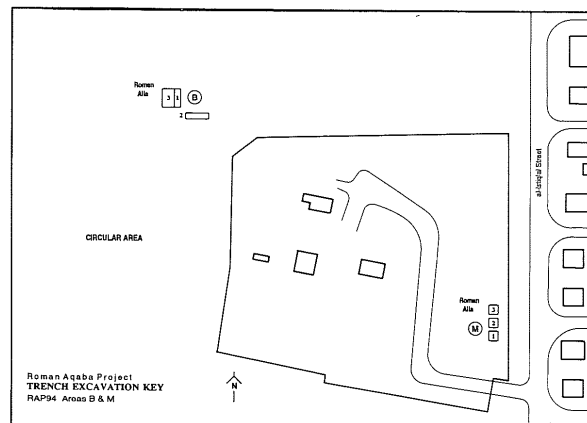
Because the 'Aqaba Regional Authority plans to develop the Circular Area, it seemed appropriate to search for ancient cultural remains at deeper levels in these areas. Therefore, a series of trenches up to 3.50 m deep was excavated with mechanical equipment adjacent to each excavation area. In most cases the deep trenches revealed thick deposits of fluvial and/or beach sand but little evidence of cultural remains. Therefore, by the second week Areas C, D, E, F, G, and H were closed out and their personnel moved to more promising areas. Nevertheless, these areas did aid in defining the parameters of classical Aila and yielded important evidence about possible changes in the coastline, discussed below.

Area B. On the northwestern corner of a now abandoned military base west of al-Istiklāl Street are three mounds of sand and palm trees (marked G8, G9, and G10 on Meloy's map, cf. Meloy 1991: Fig.3). G8 is the highest mound in the entire Circular Area at an elevation of 8.4 m. Although Meloy observed that these mounds had been disturbed by modern military trenching, he nevertheless noted many potsherds and some ceramic slag atop all three. The diagnostic sherds dated primarily from the first century BC to the fourth century AD, that is Early Roman/Nabataean and Late Roman. The recent trenching had revealed traces of mudbrick walls and a few dressed building stones in this area. This suggested that the mounds were remains of structures, probably of the Early and Late Roman periods (Meloy 1991).

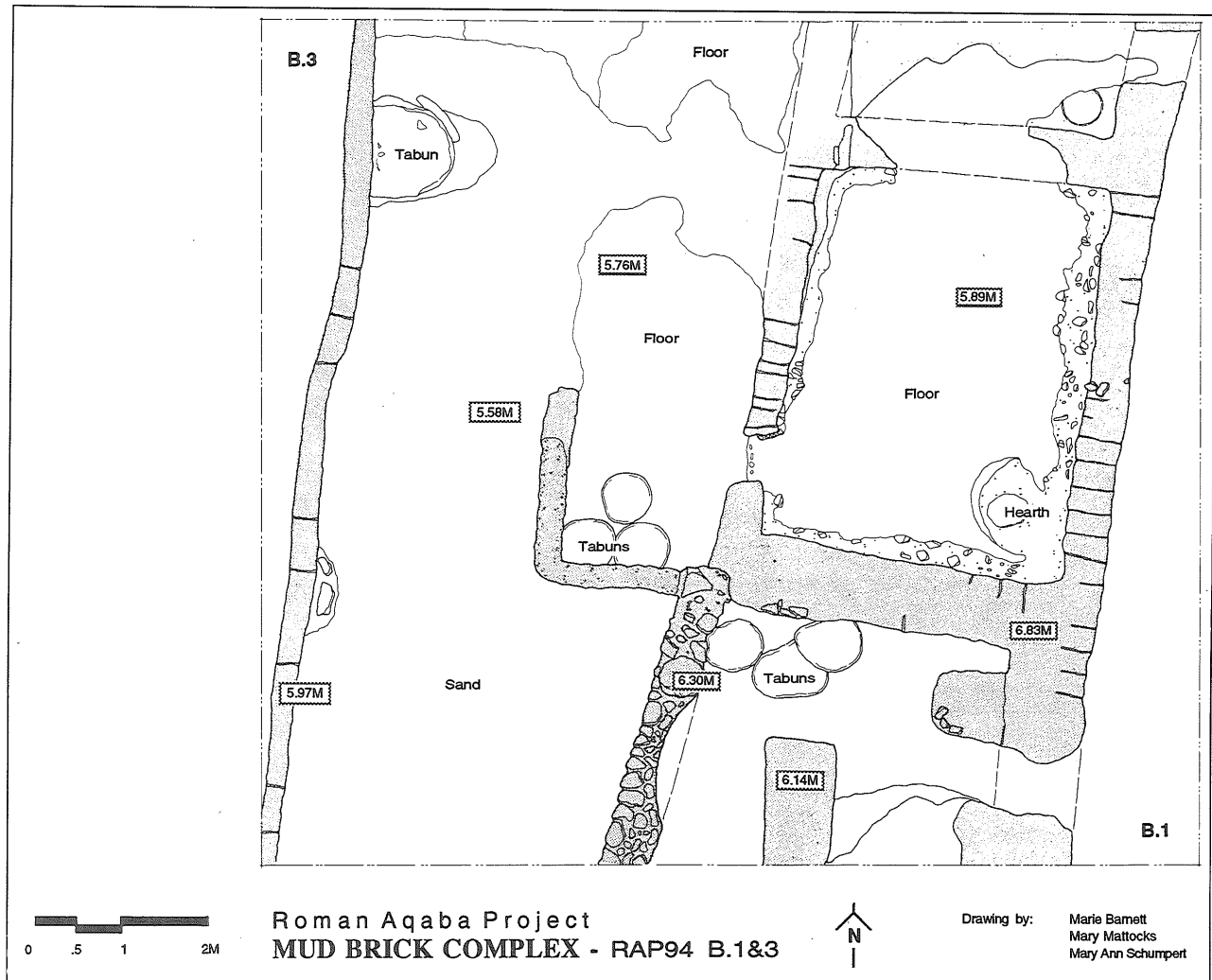
The three mounds surveyed by Meloy seemed too disturbed for worthwhile excavation. But another, lower mound adjacent to the north-west corner of the abandoned military base was excavated as Area B (Figs.4 and 5). Three trenches (B. 1-3) were laid out atop this mound. B.1 and B.2 (both 2 x 10 m) were laid out to provide N-S and E-W cross sections of the mound. B.2 was later expanded by a 2 x 7 m extension to the south-east of the original trench. B.3 (7 x 10 m) was opened west of B.1 to elucidate structures exposed in B.1. The 1.50 m balk between B.1 and B.3 was eventually removed as well.

Excavation revealed a complex of mud-brick structures (Figs. 5 and 6). Occupation

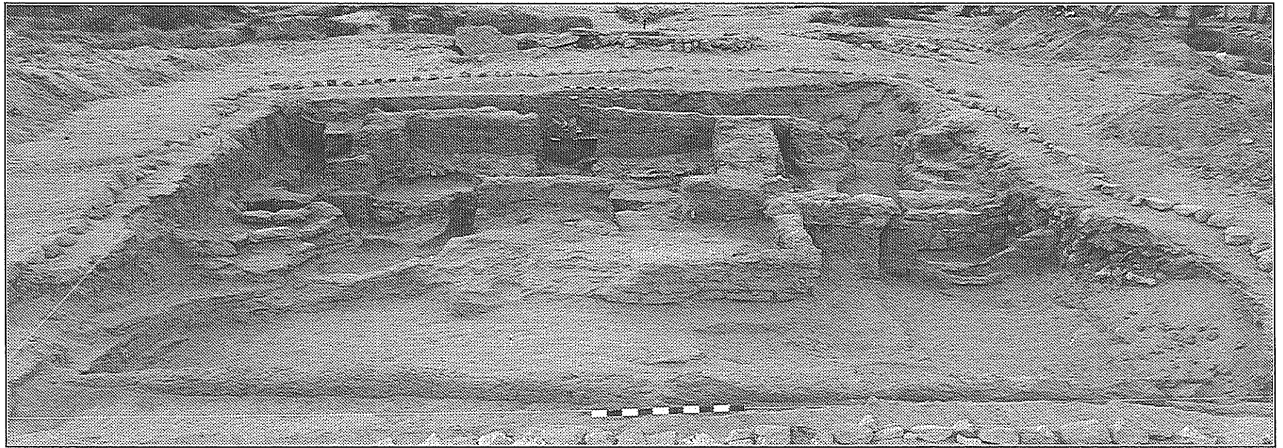
began in the Early Roman/Nabataean period (first centuries BC/AD) and continued in several phases through the Late Roman pe-



4. Map showing location of trenches in RAP Areas B and M.



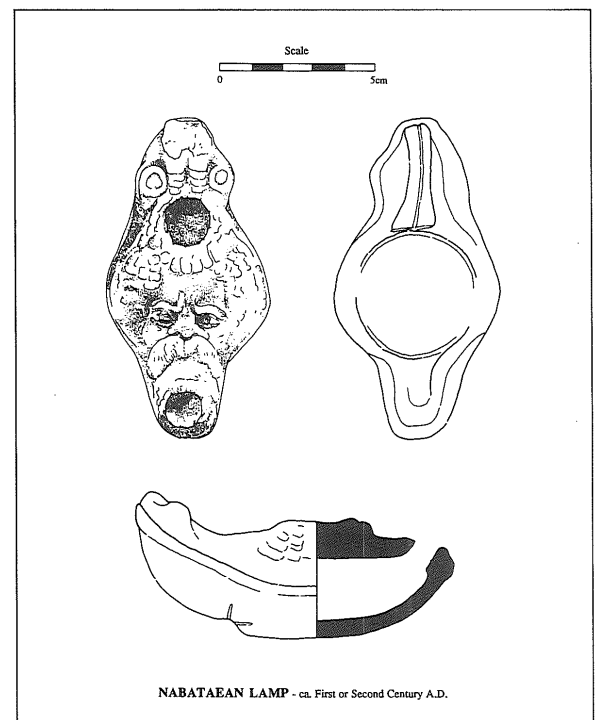
5. Plan of mudbrick complex in Area B (Trenches B.1 and B.3). The Nabataean/Roman structures were subsequently disturbed by modern military trenching.



6. General view of domestic mudbrick complex in Area B (Trenches B.1 and B.3). View to east.

riod (second to early fourth centuries AD). Although the ancient structures had been disturbed by modern trenching, they contained many *ṭawābīn* with associated ash and other installations. Artifacts provided useful economic evidence about this early period in the city's history. The pottery included Eastern Sigillata, a few amphorae, glass sherds, many faunal remains (ca 70% fish), several imported stone objects, and seven bronze coins. A Nabataean lamp from Area B with a man's face in low relief probably dates to the first or second century AD (Fig.7). It is paralleled at Mo'a in the Negev (Cohen 1993: 1139). The evidence suggests that Area B was a domestic complex occupied until perhaps the fourth century AD, then abandoned. Only a handful of Byzantine sherds and two Byzantine coins (both from modern contexts) suggest a possibility of transient later occupation before the modern military trenching.

Area M. East of Area B and on the western side of al-Istiklāl Street, a deep trench for a sewer pipe had been dug in 1993. Many sherds of the Early Roman/Nabataean period were noticed near this trench, suggesting evidence of the earliest period of the city's history. Therefore three 5 x 5 m trenches were opened as Area M in a N-S line just west of and parallel to the modern street (Figs. 3 and 4). These trenches (M. 1-3) yielded mostly Early Roman/Nabataean material. Notably, the area did not yield a single Byzantine



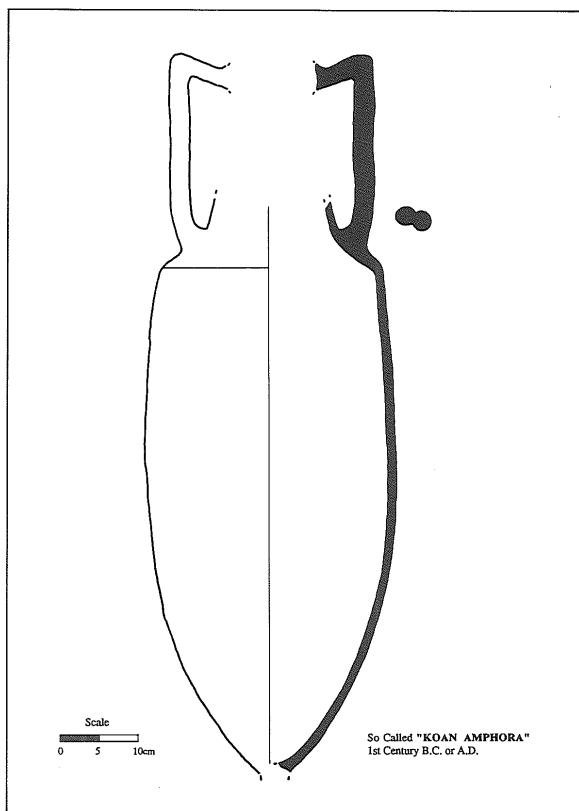
7. Drawing of a Nabataean molded lamp, decorated with the face of a human male in low relief, recovered from Trench B.3. Probably first or second century AD.

sherd.

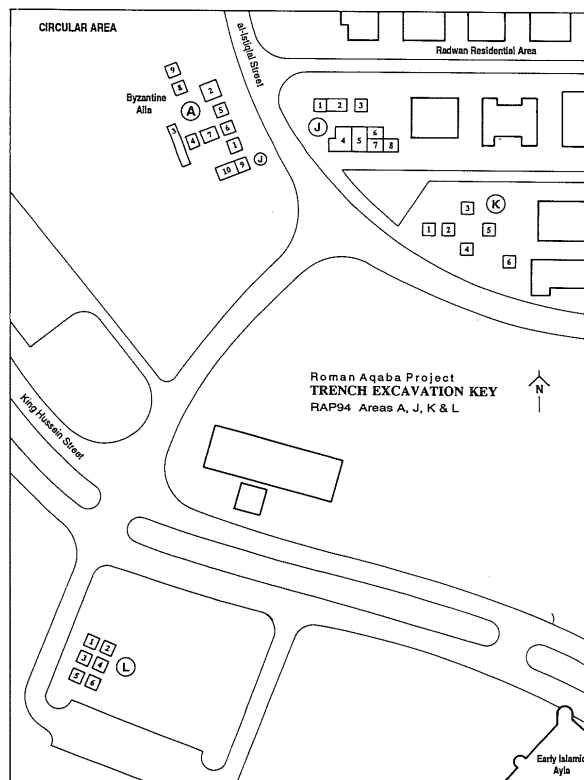
Excavation revealed stone and mudbrick structures. These experienced several phases of use, with mudbrick walls and associated *ṭawābīn* in the earlier phases and crude stone walls in the later phases. Rich artifactual remains included two Nabataean coins, glass sherds, classic Nabataean painted and unpainted pottery and Eastern Sigillata. Trench M.1 also yielded several largely reconstructable ceramic vessels from

mudbrick tumble marking the end of one phase. Among these was a so-called Koan amphora (Fig. 8) produced in the western Mediterranean in the first centuries BC/AD. These vessels were wine containers. They are attested at other Red Sea ports and as far east as India (Peacock and Williams 1986: 105-06). In fact, sherds of this same type of amphora were found in other excavation areas, proving that the vessel from Area M was not an isolated find. It thus constitutes important evidence for wine traded from the western Mediterranean to the Red Sea via Aila in the Early Roman period.

Area A. A low mound of sand, nearly 500 m south of Area B and ca 300 m south of Area M, is located in the south-east edge of the Circular Area, directly adjacent to al-Istiklāl Street (Figs. 3 and 9). Much of the mound now lies under the modern street. The mound clearly extends much further,



8. A so-called "Koan amphora" (actually from the western Mediterranean) found in Area M. It dates to the first century BC or AD and probably served as a transport vessel for wine.



9. Map showing location of trenches in RAP Areas A, J, K, and L.

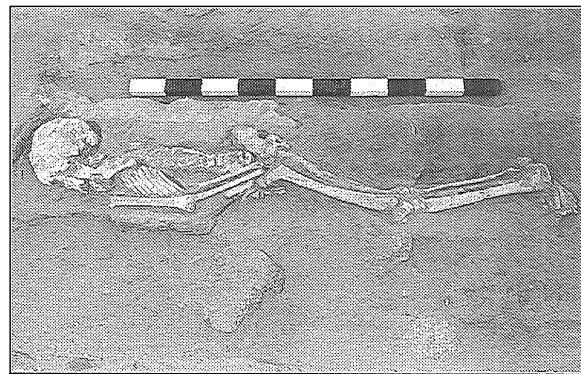
into the Raḍwān residential area. The surviving portion west of al-Istiklāl Street measures ca 100 x 50 m and rises over 3 m in height. Meloy noted that the mound was rich in surface artifacts, including pottery and glass sherds and ceramic slag. Most of the surface pottery was Byzantine, especially fifth/sixth centuries AD (Meloy 1991: 407-10). Thus it was hoped that excavation of this mound (Area A) would provide evidence of Byzantine Aila.

A series of nine trenches (A.1-9) of varying dimensions was laid out to sample portions of the mound. Trenches A.1-7 basically formed a T, with the N-S line extending through Trenches A.2 (8 x 8 m), A.5 (6 x 6 m), A.6 (6 x 6 m), and A.1 (6 x 6 m) and an E-W line through Trenches A.6 (6 x 6m) A.7 (5 x 7 m), A.4 (5 x 5 m), and A.3 (2 x 8 m). The seven trenches together encompassed an area of nearly 300 sq. m.

Excavation in Trenches A.1-7 revealed a complex of mudbrick structures just below

the modern ground surface (Fig.10). Beneath the complex was a thick (ca 1m) layer of mostly sterile sand. Tina Niemi, project geologist, suggested that earlier remains might lie under the sand layer. Further, the 'Aqaba Regional Authority was planning extensive road work that threatened to destroy Area A. Therefore, given this emergency, mechanical equipment was employed to search for earlier remains north of the existing trenches in Area A. After removal of the overlying sand layer, two additional trenches were laid out to the north of the original seven trenches. Trench A.8 (4 x 4 m) uncovered domestic installations, including three *tawābīn*. The trench also yielded four coins, dating from the late third to mid-fourth centuries, a steatite (schist) cooking bowl and Late Roman Red Ware (mostly African Red Slip) of similar date. This was the earliest stratified evidence from Area A. The steatite vessel, previously attested only in Early Islamic contexts at 'Aqaba (Whitcomb 1994: 27-28), is the earliest dated evidence for the importation of these distinctive artifacts into Jordan, apparently from the Arabian peninsula.

Trench A.9 (4 x 4 m), situated immediately north of A.8, uncovered a portion of a cemetery with at least five mudbrick tombs. Each tomb consisted of a shallow cist dug into the soil (Fig.11). The sloping walls of the cist were lined by two low parallel mudbrick walls surmounted by a mudbrick cap. Three tombs were excavated. Each contained a single articulated skeleton. Two were adults, aged ca 18-25 years (Fig.11) and 25-40 years, and one child aged 1-1.5 years. The tombs were mostly devoid of grave goods. A few associated sherds were predominately Early Byzantine, a date supported by a coin dated 347-355 found within one tomb, providing a *terminus post quem* for the cemetery. How long it remained in use is problematic, but the tombs were covered by sand and thus no longer visible by the time the mudbrick complex was founded

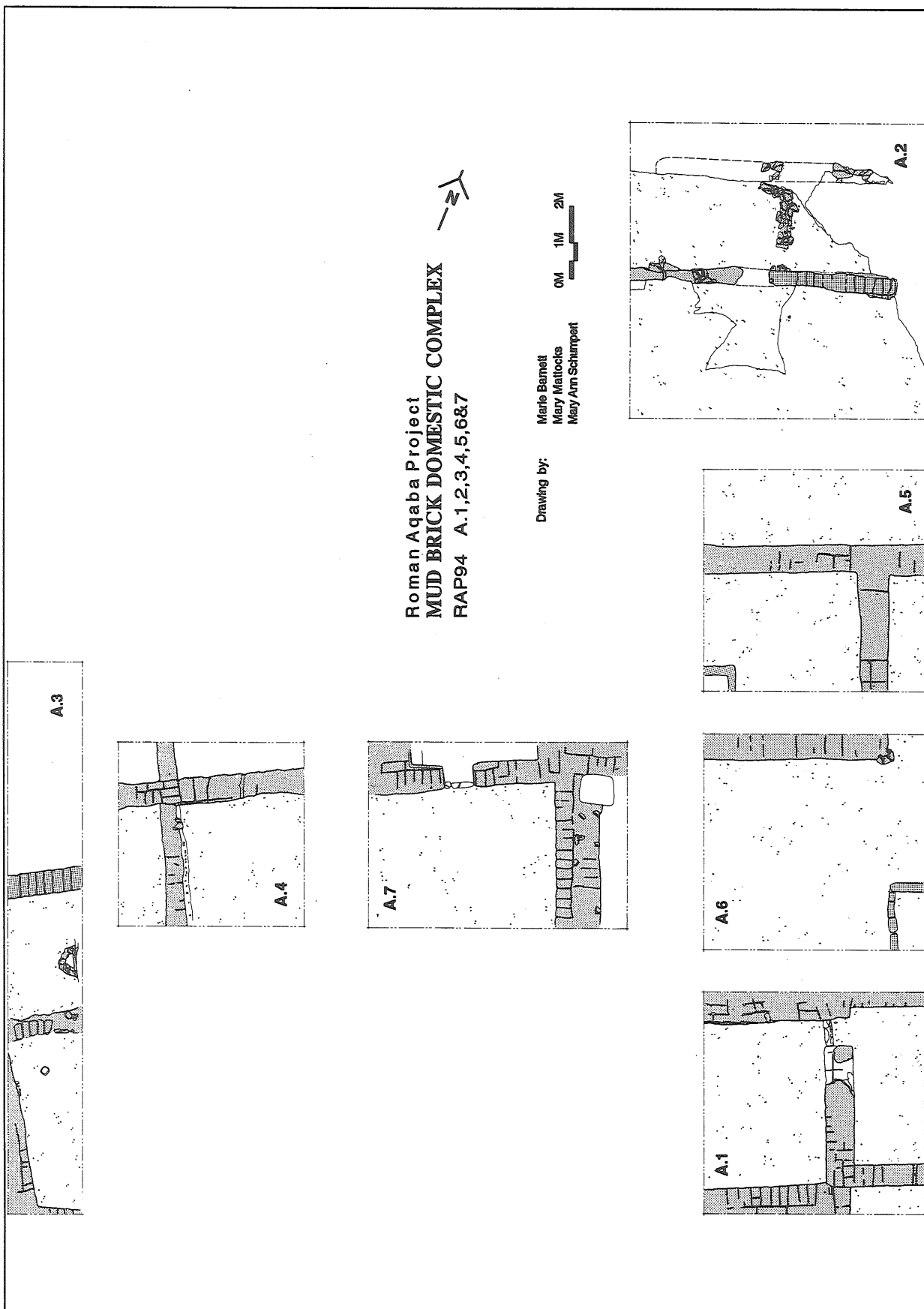


11. An articulated skeleton, probably an adult female aged ca 18-25 years, from a mudbrick tomb in Area A. Probably fourth century AD. View to west.

just to the south.

The mudbrick complex in Area A consisted of several rooms with associated floors built around a paved courtyard (Fig. 10). Most of the mudbrick walls survived only one course high. Portions of about a dozen rooms or courtyards were exposed, some connected by doorways with stone-paved thresholds. Most of the floors had been swept clean of artifacts before abandonment, as reflected by the paucity of artifacts in primary association with the structures. But domestic activities were suggested by installations built into the floors and walls of the complex and by artifactual evidence. These included fragments of steatite cooking vessels, glass sherds, two basalt millstones, and various domestic ceramics.

Close dating of the complex proved problematic. The pottery was mostly Late Byzantine (sixth/early seventh centuries), including African Red Slip of the sixth/early seventh centuries. The complete absence of glazed wares precludes a date after ca 800. However, a few Early Islamic sherds usually appeared in the later phases along with the predominately earlier pottery. Especially characteristic were so-called Mahesh Wares, attested in late Umayyad/early Abassid levels at Early Islamic Ayla (Whitcomb 1989c). This suggested that the complex, or at least its latest phase of occupation, dates to the eighth century. It was founded earlier, however, in the Late Byzantine period.



10. Plan of the mudbrick domestic complex in Area A. Its latest phase of occupation dates to the Early Islamic period.

Area J. Discovery of mudbrick structures in Area A drew attention to the east, directly opposite al-Istiklāl Street, where the artificial mound seemed to extend. Thus a vacant lot east of the street was targeted for excavation as Area J (Fig. 9). It initially consisted of six 5 x 5 m trenches laid out in two parallel rows of three trenches each. Trenches J.4-5 were later expanded 5m to the south. Two more trenches were opened to the east in the southern line: J.7 (5 x 5 m) and J.8 (2 x 10 m). Finally, two other trenches were opened west of the road, just south of Area A. These were Trenches J.9 (6 x 6 m) and J.10 (6 x 8 m).

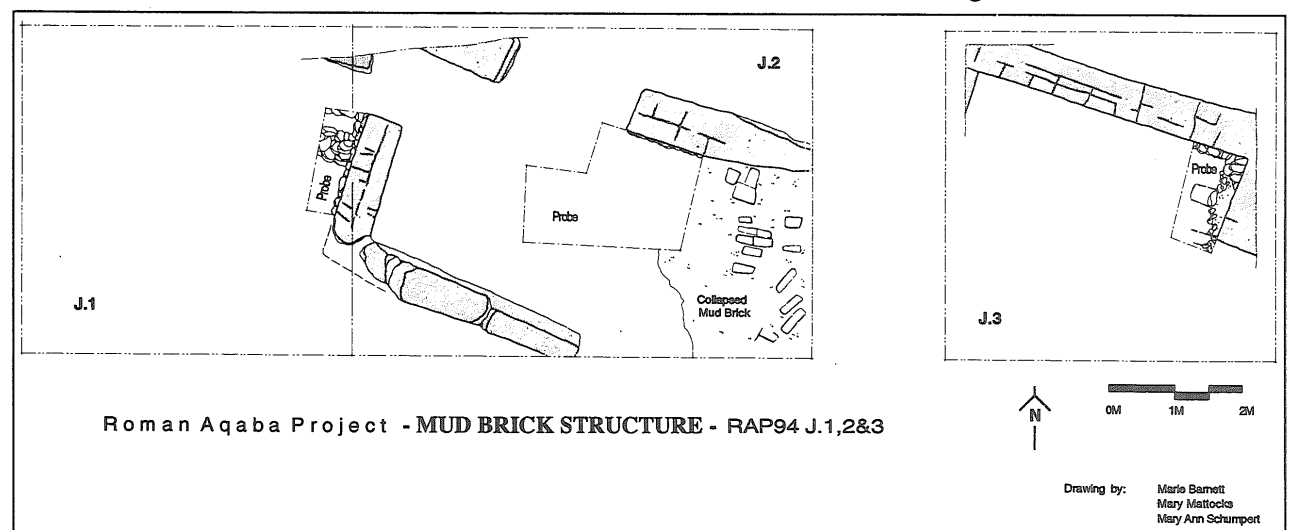
The more northerly row (J.1-3) uncovered parts of a massive mudbrick structure ca. 18.20 m wide (Fig. 12). Plastered walls of this structure rested on stone foundations. The walls and associated piers possibly once supported barrel-vaulted roofs. More fragmentary remains of these mudbrick structures were also discovered in the southern range of trenches (J.4-8), where the later city wall had cut and partially covered the mudbrick structures. Latest pottery from the foundations was Early Byzantine, including diagnostic African Red Slip sherds from the fourth century AD. Several fourth century coins were also retrieved from the foundations of the structure. The structure seems to

have witnessed little actual use. Deep probes to the foundations within the structure revealed little occupational debris and no substantial floors. The structure partially filled with sand before collapsing in several phases.

The function of the structure remains enigmatic, both because much remains unexcavated and southern portions were demolished and/or covered by later construction. A Christian basilica is one possibility, perhaps associated with the Early Byzantine cemetery in Area A just to the northwest. Mudbrick basilicas are attested in Egypt in the fourth century. A bishop for Aila, as noted above, is attested as early as 325. But more excavation is required to test this suggestion.

These mudbrick structures were cut by construction of a massive stone curtain wall and projecting tower (Figs.13 and 14). The wall averaged 1.60 m thick, was preserved up to ca. 2.00 m in height, and extended E-W for 28 m through the entire southern range of trenches. It rested directly on sand and was constructed mostly of local granite and diabase mortared into two faces surrounding an interior fill of mortared rubble.

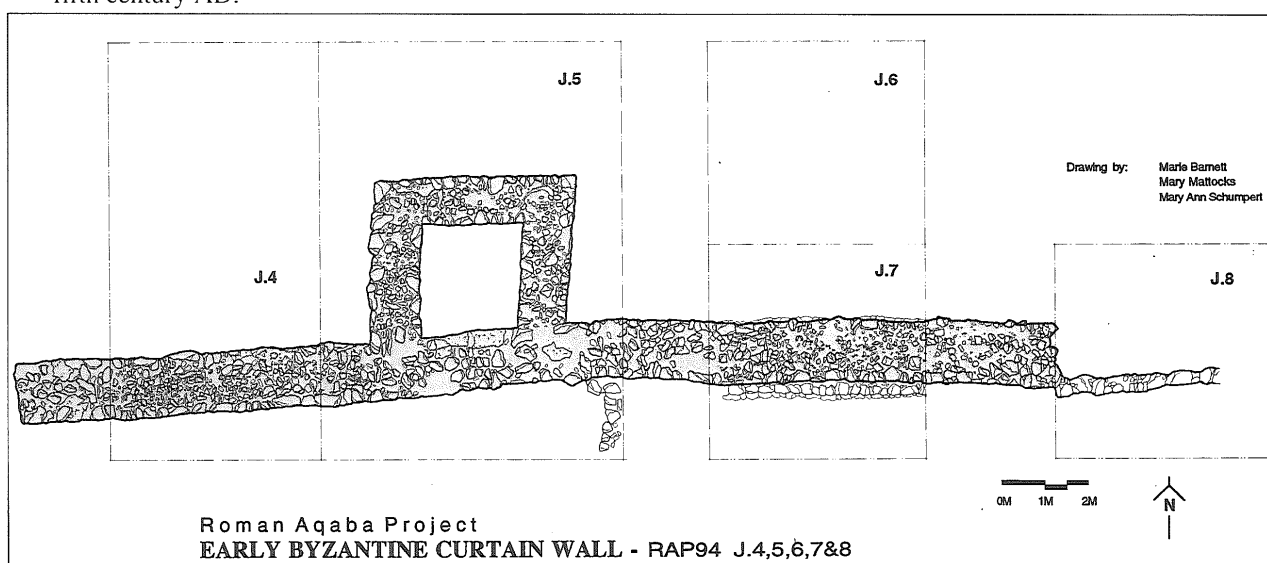
A rectangular tower was bonded to the north face of the curtain wall and projected outward 4 m. Although both curtain wall and



12. Plan of the mudbrick vaulted structure in Area J. It probably dates to the fourth century AD.



13. The Early Byzantine curtain wall and projecting tower in Area J. It was probably constructed in the late fourth or fifth century AD.



14. Plan of the Early Byzantine curtain wall and projecting tower in Area J.

tower were excavated to their foundations, no doorway was found to give access into the tower. The tower, like much of the curtain wall, was cut into the earlier mudbrick structure, part of which filled part of the tower's interior. The remainder of the interior was filled with mostly sterile sand. There was no trace of interior floors. This suggested that the lower portion of the tower was never intended for use as a room, but rather was filled immediately after construction, perhaps to create an elevated fighting platform.

The curtain wall presumably represents

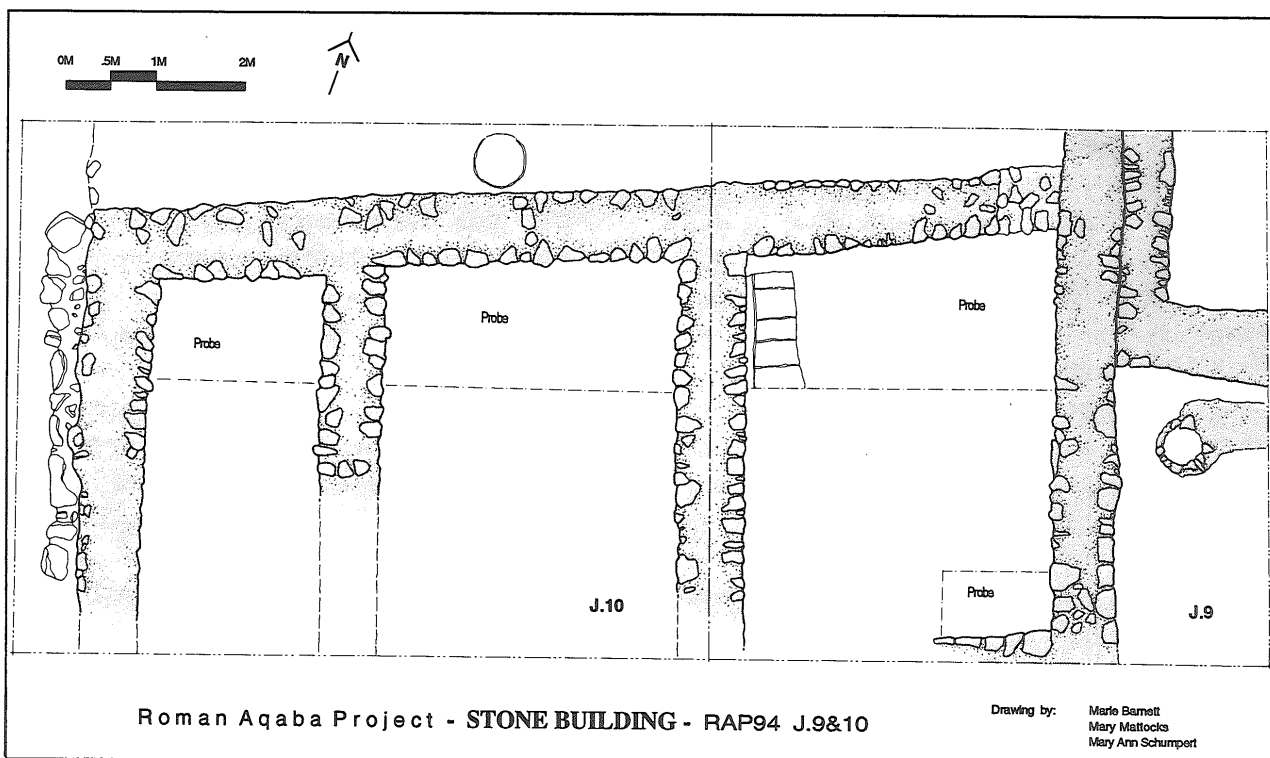
part of the city wall of Byzantine Aila. Early Byzantine pottery was recovered from the fill within the tower and mid-fourth century coins were found both in the rubble core of the wall and in sand fill within the tower. This suggested that the curtain wall dates to the Early Byzantine period and must have been constructed after the mid-fourth century. Late Byzantine (i.e., sixth/seventh centuries) pottery sealed under collapsed portions of the tower and curtain wall suggested that the curtain wall had gone out of use by this period. The wall and tower then served

as a dump, which included kiln wasters and ceramic slag. Some debris probably derived from the seventh century pottery kilns found just to the east (Melkawi, `Amr, and Whitcomb 1994). The curtain wall was robbed to its foundations in Trench J.8, the most easterly trench, but seemed to have once extended further east into the area now occupied by modern apartment buildings. Pottery associated with this robbing suggested it may also have occurred in the seventh century, when the adjacent Early Islamic town was built.

To the west the curtain wall disappeared under al-Istiklāl Street, suggesting that more of the wall might be found across the street. Therefore, late in the season two additional trenches (J.9, 10) were opened along the presumed line of the city wall, just south of Area A. Excavation revealed a complex of stone walls that formed a series of three adjacent rooms along this line (Fig.15). But none of the walls was substantial enough to be the city wall. These rooms yielded Late Byz-

antine pottery, suggesting that the walls might in fact overlie the city wall. On the last day of excavation a more substantial wall of large stones was found under the western most later wall in J.10 (visible as the unshaded wall on the extreme western edge of Fig. 15). This earlier wall extended for 3 m N-S and perhaps represents part of the northwestern corner of the curtain wall, that is where the wall turned southwards towards the shoreline. Further excavation may uncover the remaining E-W wall segment and thus complete another long portion of the Byzantine city wall.

Area K. Just southeast of Area J, across an oval paved parking lot, is another vacant lot. A group of six 5 x 5 m trenches was opened here as Area K (Fig. 9). The goal was to locate ancient remains through horizontal exposure; therefore individual trenches were widely scattered over the lot. Once the Byzantine city wall was discovered just to the northwest in Area J, it seemed likely that Area K would provide evidence of



15. Plan of Late Byzantine stone building in Trenches J.9-10. The earlier wall, shown unshaded, visible at the extreme western edge of the drawing may be a remnant of the Early Byzantine curtain wall.

occupation within the Byzantine city.

All six trenches revealed ancient remains just below the modern ground surface. A complex of stone walls, mudbrick walls, and associated floors appeared, partly covered by extensive dumps. Rich artifactual remains were recovered from these dump layers, including over 44,000 potsherds, nearly 5,000 glass sherds, hundreds of animal bones, some carbonized plant remains, and ca 40 coins. The latest pottery from these dump layers was Early Islamic, mostly Abbasid. One of the latest dump layers yielded an Abbasid coin of the early tenth century. An Arabic *dipinto* was found in an earlier context from the same trench (K. 4). The text was painted in black ink on a camel bone. The project's Semitic epigrapher, Vincent Clark, suggests dating the *dipinto* on paleographical grounds between the early eighth and early ninth centuries AD (Clark, pers. comm.), which accords well with its stratigraphic context. Other notable artifacts from these dump layers were fragments of bronze, copper, and iron artifacts, jewelry, and beads of various materials. There were also various imported stone artifacts, such as fragments of steatite cooking vessels, marble, basalt (used for small mills), and alabaster.

Removal of these dump layers exposed more architecture, including several phases of mudbrick and stone walls with associated occupation. Within these structures was some evidence of domestic and industrial installations, such as *ṭawābīn* and clay mixing pits. The latest pottery from the layers under the dumps was Umayyad and Early Abbasid. This suggests that Area K served as a domestic and possibly industrial suburb to the Early Islamic town in the Umayyad and then Abbasid periods. It was subsequently abandoned and used as a dump after the ninth century.

Despite the fact that all excavated loci excavated in Area K could be dated to the Early Islamic period, there were clear hints of earlier occupation. Most coins identified thus

far from Area K are Byzantine. The predominant pottery from the area was Late Byzantine (ca 500-650), although usually mixed with some Early Islamic sherds. Given that the deepest probe in Area K reached only ca 1 m below the modern ground surface, it seems likely that future excavation will find Byzantine occupation under the Umayyad stratum.

Area L. Nearly 250 m south-west of Area K and only ca 150 m west of the Early Islamic town is a parcel of undeveloped land near the beach, ca 100 m from the shoreline, excavated as Area L. A surface survey yielded many artifacts. A modern construction trench just west of Area L had revealed apparent ancient structures and occupation just below the modern ground surface. The goal in Area L was to locate any remains of harbor works or other installations that might have been associated with the port of ancient Aila. Area L consisted of six 6 x 6 m trenches laid out in two parallel rows of three trenches each (Fig. 9).

Excavation revealed ancient stratification immediately below the surface. A complex of mudbrick and stone walls with associated floors and domestic installations was located along one side of what appears to have been a street. Four phases of occupation were recognized. The pottery was predominantly Early Islamic, dating primarily to the late Abbasid period (ninth/tenth centuries AD). Various glazed wares, including imports from Iraq, Egypt, and the Ḥijāz were recovered. Other finds included ca 2,000 glass sherds, over forty fragments of steatite vessels, a dozen basalt grindstones and mortars, six copper/bronze weights, and a complete pair of iron scissors. Fish bones were especially prevalent in the rich faunal corpus from the area.

Therefore it appears that Area L, like Area K, was a suburb of the nearby Early Islamic settlement. It seems to have witnessed significant domestic occupation followed by extensive dumping, all within the late Ab-

basid period. Although it seems likely that earlier Islamic occupation underlies the late Abbasid phases, it remains unclear whether pre-Islamic remains lie deeper within Area L. Some pre-Islamic sherds and a few Byzantine coins were found mixed in later contexts. Since the deepest excavation in Area L reached only ca 1.70 m below the modern ground surface, further excavation is required.

Analysis of Organic Remains

Archaeobotanical Remains. The excavation yielded a significant amount of botanical remains, recovered by hand retrieval, sieving, and flotation of soil samples. Preliminary analysis of the remains provides some insights into the local economy and environment.

The relative scarcity of large wood fragments and the abundance of dung suggests that timber was not readily available in the region during the classical and Early Islamic periods. The one exception is palm wood, which does appear fairly frequently in the botanical record. Palm trees can provide large and fairly straight logs but the fibrous nature of its wood makes them difficult to cut. The palm apparently was used for both construction and (along with its fronds) as fuel. Most of the rest of the wood derived from varieties of shrubs. Dung clearly served as the principal fuel for most purposes, including cooking. Several charred but intact dung balls were recovered, most apparently from camels. Preliminary analysis suggests that the regional environment in the Roman and Byzantine periods was not appreciably different from modern conditions. This raises the question of where fuel was obtained to supply the city's metal-processing and, at least by the seventh century, pottery industries (Melkawi, 'Amr and Whitcomb 1994).

Most dietary plant remains recovered were grains, with barley predominating but wheat also being present. Some dung con-

tained barley, suggesting its use as animal fodder. Wheat presumably was mostly for human consumption. Apart from grain, grape pips were also attested. Conspicuously absent from the record were figs, olives, dates, and legumes. The absence of dates is especially surprisingly given the presence of palm wood and the existence of an extensive date palm plantation at the site in modern times. The lack of olive pits is less surprising, for the region's present environment could not have supported substantial olive cultivation and thus olives and olive oil were probably imported into the city. However caution is required by the relatively small corpus of evidence available thus far.

Faunal Remains. The 1994 excavations recovered thousands of animal bones and shells. Not surprisingly, various species of fish comprised a significant portion of the faunal corpus. Hunting seems to have made virtually no contribution to the local diet. The vast majority of mammalian bones were derived from caprines (sheep and goat), with camel bones as a significant minority. There was very limited evidence for a few other domestic mammalian species exploited for food, such as cattle, pig, and chicken. These species were much more prominent at contemporary sites farther north along the Arabian frontier, such as the forts of the *limes Arabicus* (Toplyn 1994). But the harsher environmental conditions around 'Aqaba seem to have limited their exploitation in this region. A few other domestic species used principally as work animals, such as donkey, horse, and dog, were present but also extremely rare.

Of particular importance are the sex and mortality profiles of the caprines recovered. Preliminary analysis suggests that most of these animals were imported "on the hoof" to the city for immediate consumption, rather than being raised by the local population. This model of importation for urban consumption is paralleled at other urban centers of the Roman Empire. It strongly contrasts

the forts of the *limes Arabicus* farther north, where the evidence suggests a subsistence model of locally managed caprine herds (Toplyn 1994). This raises the question of the external sources of these animals.

Conclusion

Much has been learned about ancient Aila and its environs from the first season. The regional survey has provided a wealth of new evidence about Aila's hinterland. The excavations have identified major portions of the Nabataean, Roman, and Byzantine city of Aila. Further, new evidence of the suburbs of the Early Islamic town has also emerged. The large artifactual corpus has begun to provide insights into the economy of the city.

First, there is clear evidence of human activity in the region in the prehistoric era, especially the Middle Paleolithic, Pre-pottery Neolithic, and Chalcolithic periods. Further, it also seems that human settlement in the region has tended to migrate from north to south from at least late prehistoric times through the Late Islamic period. The earliest attested sedentary occupation is at Tall al-Maqaṣṣ and its associated sites, dated to the mid-fourth millennium BC and now ca 4 km north of the present coastline. In the Iron II and Persian periods the only known settlement was at Tall al-Khalayfī, now ca 500 m from the coast.

By the first century BC the focus of settlement shifted over two km south-east of Tall al-Khalayfī to Nabataean Aila (RAP Areas B and M). There was a substantial Nabataean settlement here by the first centuries BC/AD. Both areas yielded remains of apparent domestic structures. Although Area M yielded evidence mainly from the first centuries BC/AD, Area B was occupied from the first to perhaps the fourth century AD.

Large quantities of imported goods, including fine ware pottery and amphorae from the Mediterranean, glass from the Levant and Egypt, and exotic stone suggest that

Aila was a thriving center of commerce in this period, as also documented by written sources. Results of the regional survey suggest that the Early Roman/Nabataean period was the best represented period both in terms of number of sites occupied and quantity of datable artifacts in Wādī 'Arabah north of Aila.

The ceramic corpus included 373 sherds of terra sigillata, mostly Eastern Sigillata A from eastern Mediterranean production centers. Wine amphorae from the western Mediterranean were also passing through the port, perhaps in transit to destinations via the Red Sea. The recovery of a small number of kiln wasters and ceramic slag from Area M suggests that Aila may have been producing some pottery as early as the Nabataean era. Trade via the Red Sea was certainly thriving in this period (Sidebotham 1986).

The glass consists of a variety of forms, mostly plain utilitarian vessels with a few luxury vessels. Some of the glass vessels from Aila are paralleled at the Egyptian Red Sea port of al-Quseir. Among these are examples of cast and cut colorless wares, which appear to be Egyptian imports of the first two centuries AD (Meyer 1992: 19-20, pls. 4:62, 5:93, 6:103-09). There is as yet no evidence of glass production at Aila.

A variety of stone imported for various uses also passed through the port in the Roman period, including marble, limestone, basalt, sandstone, and alabaster.

It is impossible as yet to evaluate the impact of the Roman annexation of AD 106 upon Aila. Continuity of occupation from the Early Roman to the Late Roman period is demonstrated in at least one area (Area B). Completion of the *via nova Traiana* in 111-114 with its attendant forts and garrisons probably improved both physical infrastructure and security for commercial traffic. The Romans soon began exploitation of the copper mines of Wādī 'Arabah, apparently the most intensive period of exploitation ever witnessed at these mines (Hauptmann

and Weisberger 1987, 1992; Rothenberg 1962, 1971, 1988, 1993). The 1994 excavations at Aila produced over 500 objects of copper or bronze, including some small fragments of copper ore and copper slag.

By the Early Byzantine period the principal focus of Aila had again clearly shifted another 500 m southward. A mudbrick vaulted structure in Area J and a cemetery in Area A, possibly associated with the mudbrick vaulted structure, were both established in the fourth century. But not long after, perhaps in the late fourth or early fifth century, the stone curtain wall with its interval towers cut through this sector as the northwestern segment of Byzantine Aila's defenses. Therefore Byzantine Aila must have been centered somewhere south of the city wall. How far the Byzantine city extended to the east, where a pottery industry flourished in the seventh century ca 150 m east of Area J, is unknown. Certainly the Byzantine city did not continue as far southeast as Early Islamic Ayla, which was founded *de novo* ca 650.

It is reasonable to associate the Byzantine fortifications with the presence of *legio X Fretensis*, based at Aila throughout the fourth century and presumably into the fifth century. The recovery of two coins of Constantius II (337-361) from two different construction loci of the wall and tower would seem to negate the possibility that this wall is the building project suggested by the fragmentary Latin inscription of ca. 317-326 found at Early Islamic Ayla. At least two of the three major land approaches to the city were controlled by Roman garrisons in the fourth century: a string of garrisons lined Wādī 'Arabah, including a Tetrarchic fort at Yotvata (*ad Dianam*, cf. Meshel 1989), and the *via nova Traiana*, where its southern segment through Wādī al-Yutum north-east of Aila was protected by forts at al-Wu'ayra, Khirbat al-Khalde, and Qaṣr al-Kithara (Parker 1986: 105-10).

The history of Byzantine Aila is obscure. International commerce via the Red Sea in

general and the Gulf of 'Aqaba in particular remained a high priority to the imperial government. This is illustrated by the campaigns by Romanus, *dux Palaestinae*, ca 500. He re-established Roman control over the island of Iotabe, possibly at the entrance to the Gulf of 'Aqaba, where tariffs were levied on cargoes (Parker 1986: 150-51). Literary sources make clear that Aila remained an active port through the sixth century, including trade with India. Copper ore and copper slag were recovered from Byzantine contexts, suggesting that copper extracted from the mines of Wādī 'Arabah was still being processed at Aila.

But ca 530 Justinian initiated a dramatic change in the security situation on the frontier. He demobilized many of the regular Roman frontier forces (*limitanei*) and transferred primary responsibility for the defense of the southeastern frontier to the Ghassanids, who ruled as allied kings over an alliance of Saracen tribes. *Legio X Fretensis* probably disappeared about this time, as for example the evidence suggests for *legio IV Martia*, based at Betthorus (al-Lajjūn) and several other forts farther north in Arabia (Parker 1986: 149-52; 1987: 819-23). There seems to have been no garrison at Aila by the early seventh century. Arab sources make no mention of any garrison in accounts of Aila's submission to Muslim forces in 630. The fact that stone structures were erected over the presumed line of the city wall in Area J.9-10 suggests that the wall had ceased to have any military function by the Late Byzantine period. Its masonry was then extensively robbed, perhaps to build the adjacent Early Islamic town in the mid-seventh century.

One of the most important discoveries in 1994 was the Early Islamic occupation around the Byzantine city wall, well outside the walls of Early Islamic Ayla. The walled town measures only ca 145 x 170 m, or 2.465 ha. At its height in the Umayyad and Abbasid periods, one could imagine the walled

town serving as the urban core but with extensive extramural settlement for industrial and domestic use. Excavation in Areas A, K, and L all revealed evidence of significant Early Islamic occupation. In Areas A and K this seems confined to the seventh and eighth centuries, after which the areas were abandoned or used as dumps. But the domestic occupation in Area L, closest to both shoreline and the Early Islamic town, continued well into the Abbasid period, after which it too was used as a dump by the tenth century.

The evidence suggests that these extramural areas north and west of the walled town were abandoned by the tenth century. This interpretation receives further support from Muqaddasi, cited above, who states that

the extramural settlement was in ruins by the time of his visit in the tenth century. This also seems to confirm Whitcomb's view of Ayla in the Fatimid period as an era of decline, with a smaller, poorer population (Khouri and Whitcomb 1988: 13; Whitcomb 1994: 7). Finally, Early Islamic Ayla was itself abandoned by the early thirteenth century, when settlement moved another one kilometer southward to the site of the Late Islamic castle.

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Bibliography

- Abel, F. M.
1967 *Géographie de la Palestine*. 2 vols. Paris: Gabalda.
- Burton, R.F.
1879 *The Land of Midian (revisited)*. 2 vols. London: Kegan Paul (Reprint New York: Oleander, 1984).
- Cohen, R.
1993 Hellenistic, Roman, and Byzantine Sites in the Negev Hills. v. 3. Pp. 1135-45 in *The New Encyclopedia of Archaeological Excavations in the Holy Land*. Jerusalem: Israel Exploration Society.
- Doughty, C.M.
1936 *Travels in Arabia Deserta*. 2 vols. 3rd ed. London: Jonathan Cap (Reprint New York: Dover, 1979).
- Frank, F.
1934 Aus der 'Araba. *ZDPV* 57: 191-280.
- Gregory, S. and Kennedy, D.
1985 *Sir Aurel Stein's Limes Report*. BAR Int. Ser.272. Oxford: British Archaeological Reports.
- Glueck, N.
1935 *Explorations in Eastern Palestine, II*. AASOR 15. New Haven: ASOR.
1938a The First Campaign at Tell el-Kheleifeh. *BASOR* 71: 3-17.
1938b The Topography and History of Ezion-geber and Elath. *BASOR* 72: 2-13.
1939a *Explorations in Eastern Palestine, III*. AASOR 18-19: 1-3 New Haven: ASOR.
1939b The Second Campaign at Tell el-Kheleifeh (Ezion-geber: Elath). *BASOR*. 75: 8-22.
1940 The Third Season at Tell el-Kheleifeh. *BASOR* 79: 2-18.
1965 Ezion-geber. *BA* 28: 70-87.
- Hauptmann, A. and Weisgerber, G.
1987 Archaeometallurgical and Mining-Archaeological Studies in the Area of Feinan, Wadi 'Arabah (Jordan). *ADAJ* 31: 419-31.

- 1992 Periods of Ore Exploration and Metal Production in the Area of Feinan, Wadi 'Araba, Jordan. Pp. 61-66 in *SHAJ* IV. Amman: Department of Antiquities of Jordan.
- Khalil, L.
1987 Preliminary Report on the 1985 Season of Excavation at el- Maqass - 'Aqaba. *ADAJ* 31: 481-83.
1992 Some Technological Features from a Chalcolithic Site at Magass-Aqaba. Pp. 143-48 in *SHAJ* IV. Amman: Department of Antiquities.
- Khoury, R. G.
1988 *The Antiquities of the Jordan Rift Valley*. Amman: Al Kutba .
Khoury, R. G. and Whitcomb, D. S.
1988 *Aqaba: "Port of Palestine on the China Sea"*. Amman: Al Kutba.
Kirkbride, A. S. and Harding, G. L.
1947 Hasma. *PEQ* 79:7-26.
Knauf, E. A. and Brooker, C. H.
1988 Review of Khoury and Whitcomb 1988. *ZDPV* 104: 179-81.
Kraemer, C. J.(ed).
1958 *Excavations at Nessana*. v. 3, Princeton: Princeton University.
- Laborde, Léon de
1836 *Journey through Arabia Petraea, to Mount Sinai and the Excavated City of Petra, the Edom of the Prophecies*. London: John Murray.
- MacAdam, H. I.
1989 Fragments of a Latin Building Inscription from Aqaba, Jordan. *ZPE* 79: 163-72.
- Melkawi, A. 'Amr, K. and Whitcomb, D.
1994 The Excavation of Two Seventh Century Pottery Kilns at Aqaba. *ADAJ* 38: 447-68.
- Meloy, J. L.
1991 Results of an Archaeological Reconnaissance in West Aqaba: Evidence of the Pre-Islamic settlement. *ADAJ* 35: 397-414.
- Meshel, Z.
1989 A Fort at Yotvata from the Time of Diocletian. *IEJ* 39: 228-38.
- Meyer, C.
1992 *Glass from Quseir al-Qadim and the Indian Ocean Trade*. Studies in Ancient Oriental Civilization 53. Chicago: Oriental Institute, University of Chicago.
- Morris, E. J.
1842 *Notes of a Tour through Turkey, Greece, Egypt, and Arabia Petraea, to the Holy Land: including a Visit to Athens, Sparta, Delphi, Cairo, Thebes, Mount Sinai, Petra, etc.* Philadelphia: Carey and Hart.
- Niemi, T. M.
1995 Geoarchaeological Investigations in the Greater Aqaba Region: Roman Aqaba Project 1994. Unpublished field report.
- Parker, S. T.
1986 *Roman and Saracens: A History of the Arabian Frontier*. ASOR Dissertation Series 6. Winona Lake, IN: Eisenbrauns.
1987 History of the Roman Frontier East of the Dead Sea. Pp.793-823 in S. T. Parker, (ed.), *The Roman Frontier in Central Jordan: Interim Report on the Limes Arabicus Project, 1980-1985*, 2 vols. BAR Int. Ser. 340. Oxford: British Archaeological Reports.

- Peacock, D. P. S. and Williams, D. F.
1986 *Amphorae and the Roman Economy: An Introductory Guide*. London: Longman.
- Pratico, G. D.
1993 *Nelson Glueck's 1938-1940 Excavations at Tell el- Kheleifeh: A Reappraisal*. Atlanta: Scholar's Press.
- Robinson, E.
1841 *Biblical Researches in Palestine, Mount Sinai, and Arabia Petraea: A Journal of Travels in the Year 1838*. Boston: Crocker and Brewster.
- Rothenberg, B.
1962 Ancient Copper Industries in the Western Arabah. *PEQ* 94: 5-71.
1971 The 'Arabah in Roman and Byzantine Times in the Light of New Research. Pp. 211-23 in *Roman Frontier Studies 1967*. The Proceeding of the 7th International Congress. Tel-Aviv: Tel-Aviv University.
1988 *The Egyptian Mining Temple at Timna*. London: Institute for Archaeo-Metallurgical Studies, Institute of Archaeology, University of London.
1993 Timna'. Pp. 1475-86 in *The New Encyclopaedia of Archaeological Excavations in the Holy Land*. Jerusalem: Israel Exploration Society.
- Rüppel, E.
1829 *Reise in Nubien, Kordofan und dem peträischen Arabien vorzüglich in geographische-statistischer Hinsicht*. Frankfurt: Wilmans.
- Schertl, P.
1936 Ela-Akaba. Die Geschichte einer altchristlichen Bischofsstadt. *Orientalia Christiana Periodica* 2: 33-77.
- Schwabe, M.
1953 *Harvard Theological Review* 46: 49-55 (=SEG 13.598).
- Sevcenko, I.
1966 The Early Period of the Sinai Monastery in the Light of its Inscriptions. *Dumbarton Oaks Papers* 20: 255-64.
- Sidebotham, S. E.
1986 *Roman Economic Policy in the Eurythra Thalassa: 30 B.C.-A. D. 217*. Leiden: Brill.
- Smith, A. M. II and Niemi, T. M.
1994 Results of the Southeast 'Arabah Archaeological Reconnaissance. *ADAJ* 38: 469-83.
- Toplyn, M. P.
1994 *Meat for Mars: Livestock, Limitanei, and the Logistics of Food Provisioning for the Roman Army on the Arabian Frontier (A.D. 284-551)*. Ph. D. Diss., Harvard University.
- Whitcomb, D.
1986 Excavations in Aqaba: Preliminary Report on the 1986 Season. Unpublished field report.
1987 Excavations in Aqaba: First Preliminary Report. *ADAJ* 31: 247- 66.
1988 A Fatimid Residence in Aqaba, Jordan. *ADAJ* 32: 207-24.
1989a Evidence of the Umayyad Period from the Aqaba Excavations. Pp. 164-84 in M. A. Bakhit and R. Schick (eds) *The Fourth International Conference on the History of Bilad al-Sham during the Umayyad Period. Proceedings of the Third Symposium 2-7 Rabi'I 1408/24-29 October 1987*. V. 2. Amman: University of Jordan.
1989b Coptic Glazed Ceramics from the Excavations at Aqaba, Jordan. *Journal of the*

- American Research Center in Egypt* 26: 167-82.
- 1989c Mahesh Ware: Evidence of Early Abbasid Occupation from Southern Jordan. *ADAJ* 33: 269-85.
- 1990 Diocletian's *misr* at 'Aqaba. *ZDPV* 106: 156-61.
- 1993 The Fourth Gate at Ayla: A Report on the 1992 Excavations at Aqaba. *ADAJ* 37: 533-47.
- 1994 *Ayla: Art and Industry in the Islamic Port of Aqaba*. Chicago: Oriental Institute of the University of Chicago.
- 1995 The Miṣr of Ayla: New Evidence for the Islamic City. Pp. 277-88 in *SHAJ* IV. Amman: Department of Antiquities.
- Woolley, C. L. and Lawrence, T. E.
- 1936 *The Wilderness of Zin*. New York: Scribner's.
- Zayadine, F.
- 1994 Ayla-'Aqaba in the Light of Recent Excavations. *ADAJ* 38: 485-505.

Bibliography of Ancient Authors

Antoninus Placentius

- 1965 *Corpus Christianorum Series Latina*. No.39 v. 175: 149. Turnhout: Brepols.

Diodorus Siculus

- 1933-67 Library of History. 12 vols. in the Loeb Classical Library. Translated by C.H. Oldfather, *et al.* Cambridge, MA: Harvard University.

Eusebius

- 1904 *Onomasticon der biblischen Ortsnamen*. E. Klostermann (ed). Leipzig: Hinrichs.

Josephus

- 1926-65 *Jewish Antiquities*. 7 vols. in the Loeb Classical Library. Translated by H. St. J. Thackeray, Ralph Marcus, Allen Wikgren, and L. H. Feldman. Cambridge, MA: Harvard University.

Pliny the Elder

- 1938-62 *Natural History*. 10 vols. in the Loeb Classical Library. Translated by H. Rackham, W.H.S. Jones and D. E. Eichholz. Cambridge, MA: Harvard University.

Procopius

- 1914 *The Persian War*. Vol. 1 in the Loeb Classical Library. Translated by H.B. Dewing. Cambridge, MA: Harvard University.

Ptolemy

- 1843-45 *Geographia*. C. F. A. Nobbe (ed). Leipzig: Tuebner. Reprint Hildesheim 1966.

Strabo

- 1930 *Geography*. 8 vols. in the Loeb Classical Library. Translated by H. L. Jones. Cambridge, MA: Harvard University.