DHAMAR PROJECT

Tony J. Wilkinson and McGuire Gibson

The fourth field season in 1998 commenced in early February and continued until the end of March 1998, with a break for the Fourth International Conference on the Civilization of Ancient Yemen in San'a, 10–13 March. Soundings were made in the sites of Ribat 'Amran and Karraib; architectural studies of Bronze Age and Himyarite/Iron Ages sites were undertaken by Glynn Barratt (University of Birmingham) and Eleanor Barbanes (University of California at Berkeley); inscriptions were read by Norbert Nebes (University of Jena); the geomorphology of ancient lakes was investigated by Caroline Davies (Arizona State University); Charles French (University of Cambridge) examined the history and development of terraced soils. Our three representatives, Ali Sanabani, Khalid al-Ansi, and Khalid al-Hajj, are all to be thanked for contributing enormously to the success of fieldwork. Considerable gratitude must especially go to officials of the General Organization of Antiquities and Museums, especially Drs. Yusuf Abdullah and Ahmed Shujar, and to Ahmed Shemsan, for help and advice throughout the season. Funding for the sea-

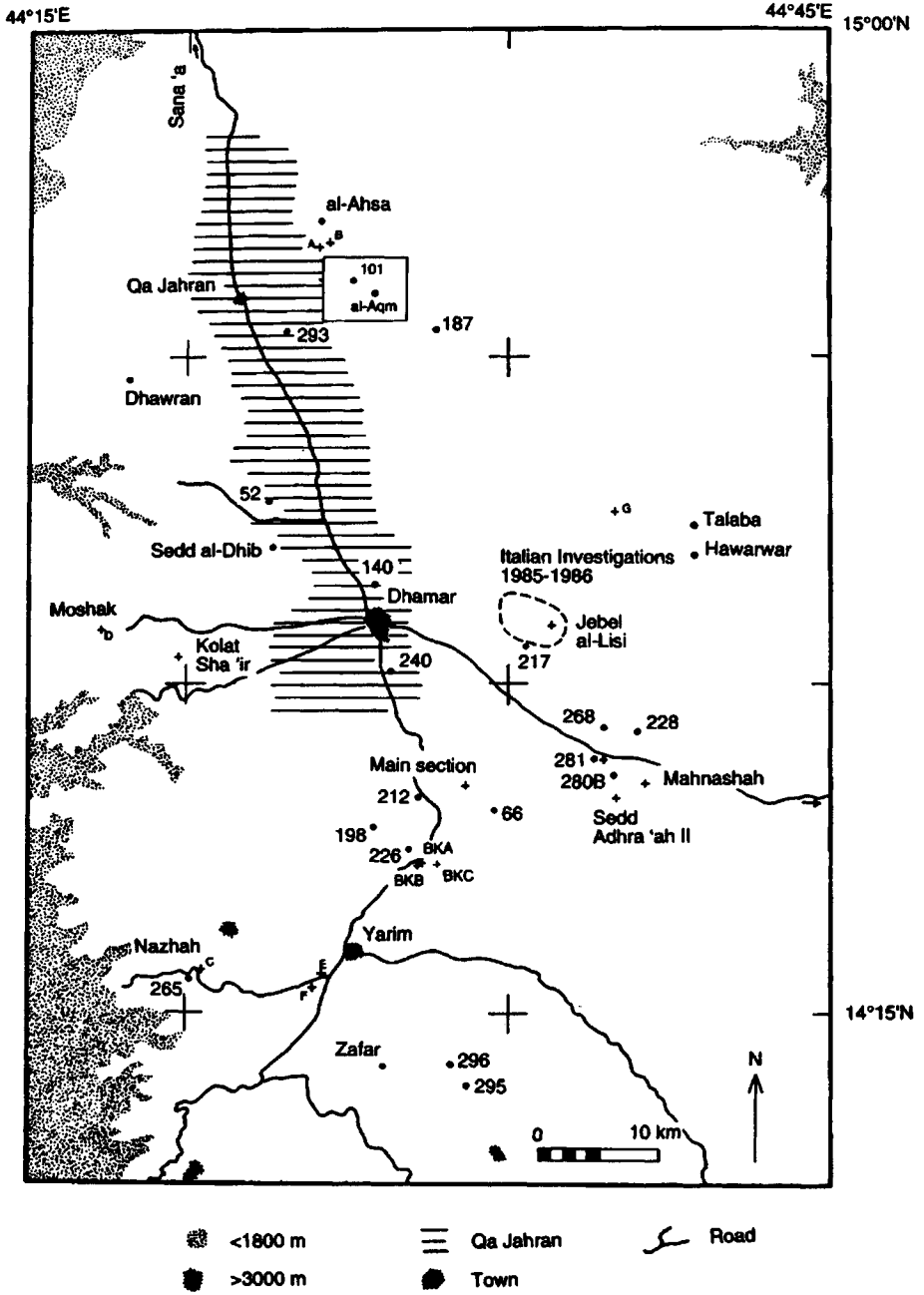

Figure 1. Area of Dhamar Survey showing sites mentioned in text

son came from the National Science Foundation, the National Geographic Society, and several private donors. We wish to thank all who contributed funds to what proved to be a very successful field season.

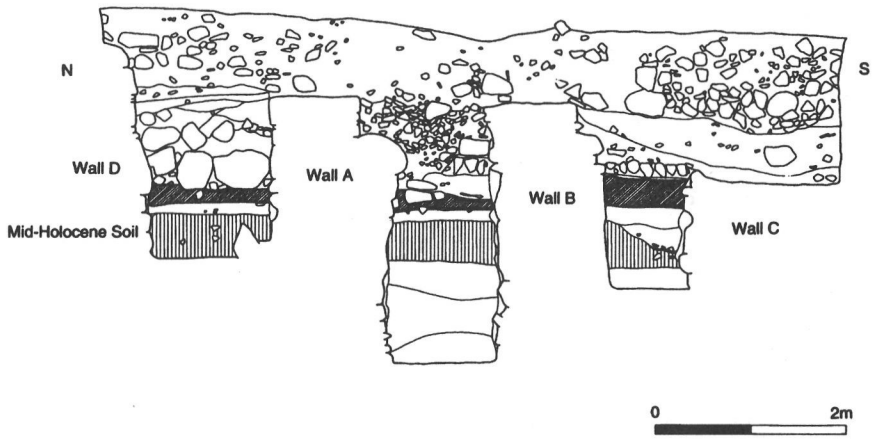

Figure 2. Section of Ribat 'Amran (DS 226) showing massive Himyarite walls cutting through pre-existing Neolithic soil

In order to provide well-dated pottery types for use in dating the sites found during survey, soundings were made in three sites in the 1998 field season. These small excavations were conducted by McGuire Gibson, with the help of Krista Lewis and Jason Ur, and were in the sites of Ribat 'Amran and Karraib. At Ribat 'Amran (DS 226) the east section of a large bulldozer pit was cleaned and partly excavated to expose the foundations of massive Himyarite period buildings (figs. 2–3). The foundations cut through horizontal layers that included an ancient soil of the Neolithic period on top of which was a Neolithic hearth with associated obsidian chipped stone tools. There then followed between about 1500 and 0 BC, the accumulation of cultural deposits on the edge of the settlement, which were then followed by the construction of massive stone foundations of walls dating to the Himyarite period

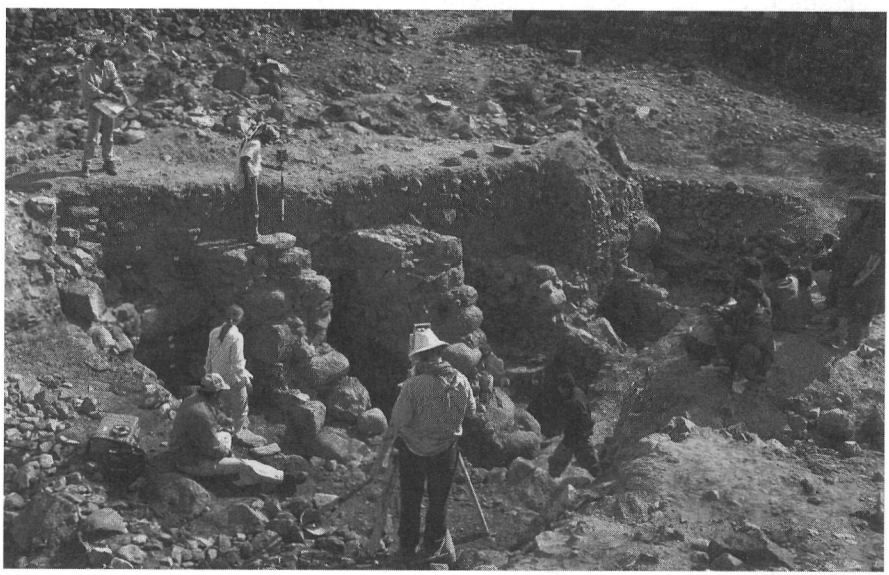

Figure 3. Excavations at Ribat 'Amran (DS 226)

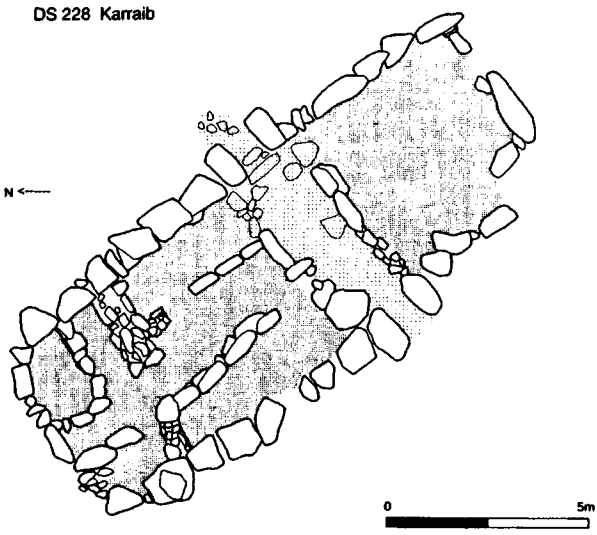

Figure 4. Bronze Age house at Karraib (DS 228)

(ca. first century BC to fifth century AD in this case). As a result of the radiocarbon dating program we can now see that occupation at Ribat 'Amran continued intermittently from the Neolithic period (fourth millennium BC), through the Iron Age, and into late Himyarite times.

Excavations at Karraib (DS 228), near Khirbet Afiq, provided insights into the history, layout, and construction of a single Bronze Age house (figs. 4–6) which was occupied during the second half of the second millennium BC. According to radiocarbon estimates on charcoal recovered from the room fill (ca. 1200 BC), this occupation represents the final stage of the Bronze Age prior to its transition into the distinctive assemblage of Iron Age types of the first millennium BC. In addition to the excavations, a plan covering about 1 ha of the site was drawn by architectural surveyors Barratt and Barbanes. This area, in turn, was placed in a larger context by the general mapping of the 3–4 ha site as well as the adjacent settlement areas of Bronze Age and Iron Age date. In contrast to the sites of Hammat al-Qa (see the *1996/97 Annual Report*), the pattern of buildings within Karraib was rather dispersed, with individual rectangular stone-built structures being separated by broad areas of rubble and open spaces that in part have been recently used as fields. At present it is not clear whether these open areas are ancient features, or have resulted from subsequent clearing of stones for fields. In addition to the house at DS 228, a sounding was briefly conducted in the nearby site of Karraib al-Sufla (DS 227), but this site remains undated.

The program of architectural surveying also produced ground plans of the large first millennia BC and AD sites of Khirbet al-Hussayn (DS 212) and Khirbet al-Kash'a (DS 198), both of which were partly surrounded by major walls with irregular rectangular bastions.

Archaeological Survey

Following four years of fieldwork in which 299 sites have been recorded, it is now possible to make some broad generalizations about the distribution of sites in the Dhamar region through the last 5,000 or so years. We emphasize that the periodization of sites is based upon very coarse chronological divisions — usually some one thousand years duration per period, or even more. Nevertheless, by the excavation of soundings in key sites we are managing to subdivide the cultural sequence into shorter periods than was previously possible. A preliminary chronology has the Neolithic period developing as a result of increased rainfall as the Indian

Figure 5. Bronze Age house at Karraib (DS 228)

Ocean monsoon increased in strength between approximately 7000 and 3000 BC. The end of this wet period appears to correspond to both a decline in rainfall, as the monsoon weakened in strength, *and* an increase in settlement. The arrival on top of the dark palaeosol of various deep deposits of silts, and loams that accumulated behind terrace walls, suggests that soil erosion had increased after about 3000 BC. That human activity probably played a significant role in this accumulation is indicated by the dramatic increase in the number of sites at this time and the now large number of radiocarbon dates on occupation levels within our soundings at various sites. Thus from the available data we can now suggest that during the third millennium BC, both the climate became drier *and* population increased rapidly. Consequently soil erosion increased dramatically as a result of both factors which served to reduce vegetation cover and disturb the soil.

Archaeological sections exposed between 1995 and 1998 at the three prehistoric sites of al-Sibal (DS 66), Hammat al-Qa (DS 101), and Karraib (DS 228) suggest that following the end of Bronze Age occupation, that is at some time during the second millennium BC, the abandoned settlements became veneered by a thin accumulation of aeolian dust. There is however nothing to demonstrate that this represents a single event, but rather it represents an increase in the accumulation of atmospheric dust during or after the second millennium BC, which itself may form part of a general increase in deposition of atmospheric dust since the accumulation of the Neolithic palaeosol.

Settlement through Time

Because of the low intensity of the archaeological survey not all sites in any area will have been recorded; nevertheless, the following summary demonstrates that sites occupied during the last 5,000 years or so are extremely common on these

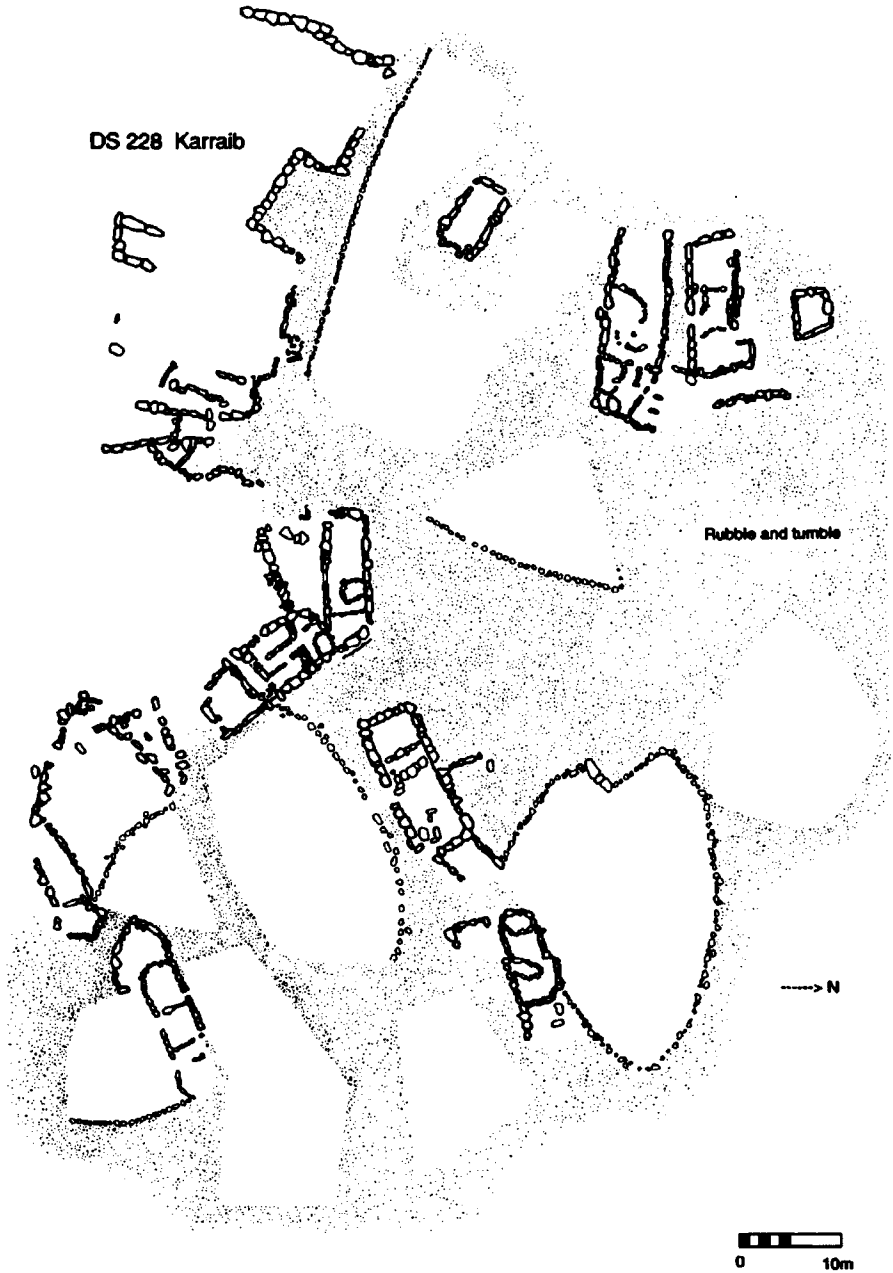

Figure 6. Surface plan of buildings in area of Building 1 at Karraib (DS 228). Blank areas are open spaces recently in use as fields and threshing floors. Drawing by G. Barratt and E. Barbanes

well-watered highlands (elevation ca. 2,000–3,000 m above sea level; rainfall: 200–700 mm per annum). There follows a summary of the salient features of settlement from the four seasons of survey:

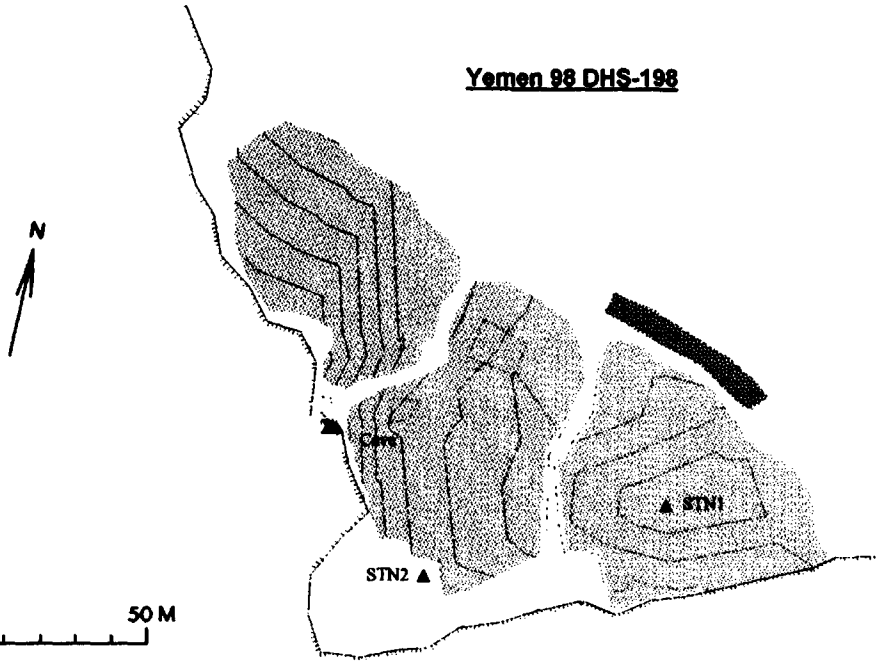

Figure 7. Iron Age / Himyarite site of Khirbet al-Khash'a (DS 198). Drawing by G. Barratt and E. Barbanes

Neolithic: The pattern of pre-Bronze Age settlement is difficult to discern, even though obsidian, the predominant toolmaking material, is a very conspicuous artifact. This under-representation of sites may be due to the fact that many sites have been erased by the intense erosion of the past 5,000 years, or some sites have been obscured by the subsequent accumulation of a layer of soil built up behind terrace walls and on valley floors. In one locality near Sedd Adhra'ah, deep valley floor silts attaining 9–10 m in depth contain a small valley floor terrace wall (at ca. 6 m depth), the associated soil of which provided a radiocarbon date on charcoal of 4970 ±80 BP (Beta 117431). If this single determination can be accepted, it suggests that valley floor agriculture might have commenced during the Neolithic, and this too might have contributed to the increased erosion noted above.

One of the remarkable discoveries of the 1998 season was a small hunting camp (DS 281) typified by an assemblage of well-made bifacially flaked chert and obsidian arrowheads. This site, perched on high cliffs overlooking the lake basin near Zeble to the east of Dhamar, is likely to be contemporary with the lake below, but this cannot be demonstrated at present. The presence of an extensive and locally dense scatter of indeterminate flakes on the valley floor adjacent to the lake sediments suggests the possibility that an extensive valley floor lithic site also co-existed with the hilltop camp. Unfortunately owing to the construction of fields over the last few centuries or millennia, this probable site is disturbed and without any archaeological context.

Bronze Age: At present it appears that there are many more Bronze Age than Neolithic sites in the Dhamar area. Of the total of 51 Bronze Age sites recorded, the

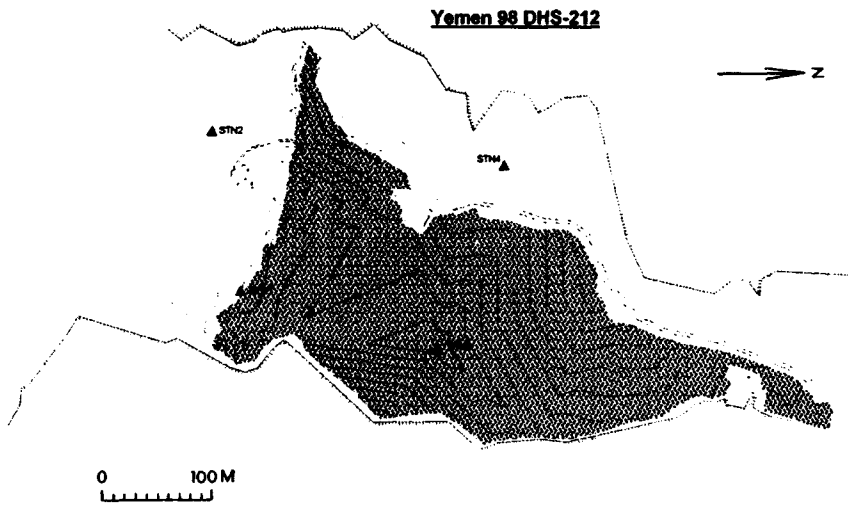

Figure 8. Iron Age Himyarite site of Khirbet al-Hussayn (DS 212). Drawing by G. Barratt and E. Barbanes

majority are situated on plateaus or rocky hilltops. Many sites are large, and in addition to the settlements of al-Sibal and Hammat al-Qa, excavated in earlier seasons, other major Bronze age sites include Medinet al-Balad near Bet Qahtan (DS 187 at ca. 4–5 ha), Karraib, near Khirbet Afiq (DS 228 at ca. 4 ha), Mosayn'a near Khirbet Afiq (DS 268 at ca. 3 ha), and Hawagir in the eastern Qa Jahran (DS 293 ca. 12.5–15.0 ha). Settlements in the Dhamar area — being larger, more nucleated, and often dense agglomerations of roughly rectangular buildings — contrast with those of Khawlan (to the northeast of our survey area), which were more rounded in shape.

Although most Bronze Age sites were situated either on rocky hilltops or plateaus, the largest site of Hawagir is an exception, being located on the loam plains of the eastern Qa Jahran (DS 293). This massive site of Hawagir, which now only remains as a scatter of large stones pulled out of walls, occasional building mounds, and a massive spread of Bronze Age sherds, has been transformed by centuries of agricultural activity as well as some modern bulldozing. The site lacks both an outer wall and a defensive location, and it appears to have developed in a location that was able to take advantage of the large area of potentially cultivable land located on the Qa Jahran, as well as its position on a major north-south route skirting the eastern edge of the plain. Thus it appears that in this area, settlement was relocated from the hills in order to take advantage of the increased agricultural potential of the plain or trade through the area. This was at the expense of a defensive location, which implies that defense was of a lower priority at that time than either trade or agricultural production. By reference to ceramics from Karraib (DS 228), Hawagir is tentatively dated to the later second millennium BC.

Iron Age: Although there are the same number of Iron Age as Bronze Age sites (51 sites, see fig. 10), the pattern of settlement is very different. Iron Age sites are both larger and in some cases are more accessible to low-lying land than those of the Bronze Age. Nevertheless, hilltop locations continue to be very important and some

of the most impressively situated sites are Iron Age hilltop fortifications. For example, the highest site recorded by the survey is the hilltop Iron Age site of al-Qattan (DS 296), which is located at 3,000 m above sea level on a high ridge some 5.5 km east of the Himyarite capital of Zafar. In this case al-Qattan, along with related lower sites of al-Shahid and al-Usaybiya (DS 295 and 298), occupies the highest ridge line on the watershed between the Red Sea and the Indian Ocean drainage. In comparison, Zafar, the later capital, occupied a lower ridge line to the west. This shift of site must have provided a larger area of low-lying cultivable land within easy reach of the main settlement than was available during the earlier period.

Himyarite: Many Iron Age sites continued to be occupied into the Himyarite period. As for previous periods, hilltop sites were preferred, but in a number of cases there was again a shift to lower ground, to land that could be irrigated by waters diverted from large dams. Although there is no reason to assume that all major dams in the area are of Himyarite date, those with inscriptions, namely Sedd al-Dhib (Qa'ima) and Sedd al-Khanuq (near Aqm) do date to that period. In the area of the latter dam we see a progressive shift of settlement from Bronze Age Hammat al-Qa (DS 101) overlooking the western plain, to the large hilltop location of Hammat al-Fil (DS 119) to the east by the Iron Age (fig. 11). With the construction of Himyarite dams in the upstream basin, there was a further shift of settlement to the location of the Himyarite town at Nunah (DS 294), situated on low rocky land on the north side of the valley (fig. 11). Because this site is within a modern village, the only evidence of Himyarite occupation consisted of re-used stones within modern buildings, scat-

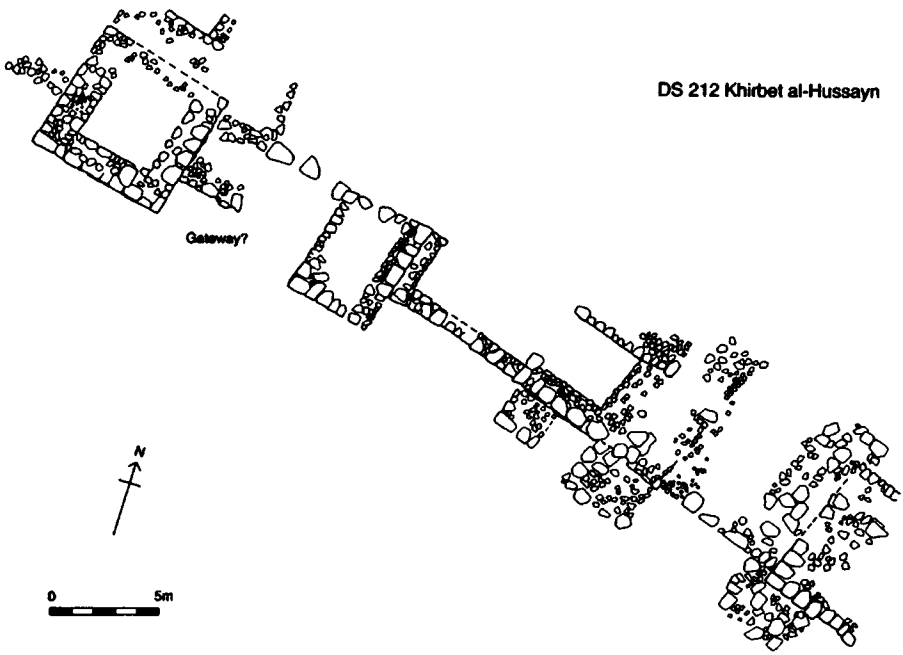

Figure 9. Detail of wall construction at Khirbet al-Hussayn (DS 212) by possible main gate. Drawing by G. Barratt and E. Barbanes

ters of sherds within the lower village of Nunah, and the remains of Himyarite buildings dug into by the local inhabitants as they excavated foundations for new buildings and outbuildings. These remains include one modern house built on pre-existing Himyarite foundations, and a nearby bath or cistern complex that was exposed by local inhabitants.

Although many inscriptions had been noted and recorded in a preliminary fashion during earlier field seasons, no detailed studies had been made until 1998. The following inscriptions were recorded by Norbert Nebes, and together they provide a valuable picture of the administration and construction of water supply systems. The following list includes, as is customary in epigraphic Old South Arabian, a prefix indicating the discoverer, in this case the Oriental Institute!

OI Hisn Afiq 1: Tentatively dated by paleography to pre-Himyarite period.

OI Hakir 1: Himyarite inscription on rock describing campaign or raid to the Hadhramaut.

OI al-Qa'ima 1: Himyarite inscription on sluice of a dam, describing administrative relationship of dam to capital at Dhu-Raydan.

OI al-Aqm 1: Late Himyarite inscription above doorway of house in village of al-Aqm.

OI Nunah 1: Inscription on rock face overlooking site of Sedd al-Khanuq. Dated to 389 of Himyarite era, inscription describes dam's construction and tribal affiliation (Muha'anif) of person who constructed dam.

OI Harwarwah 1: Himyarite inscription above doorway of private house in village of Harwarwah.

OI Harwarwah 2: Himyarite or late pre-Himyarite inscription relating to building of cistern.

OI Harwarwah 3: Himyarite or late pre-Himyarite inscription relating to building of cistern and tribal affiliation of its builder.

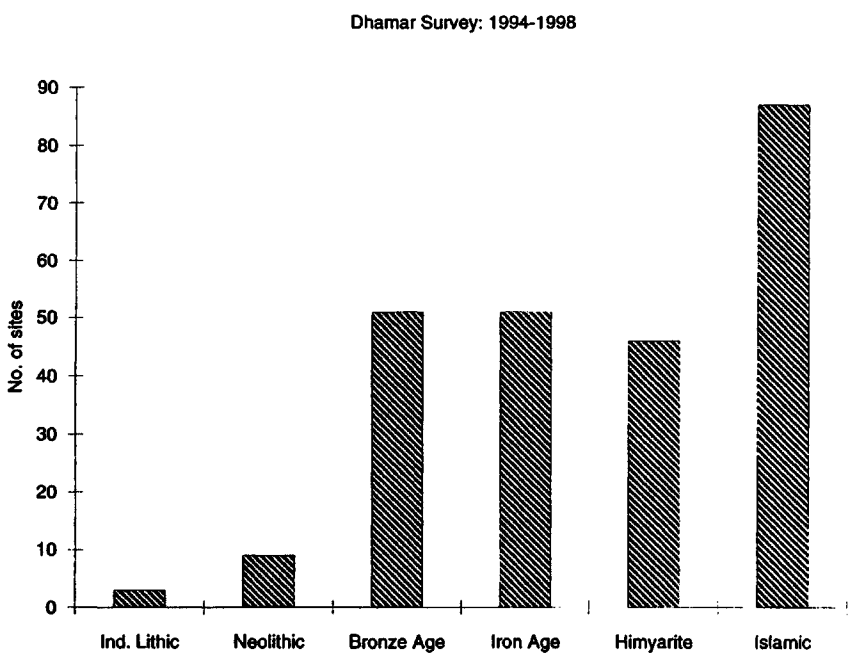

Figure 10. Number of sites dated to six broad periods of occupation in Dhamar area

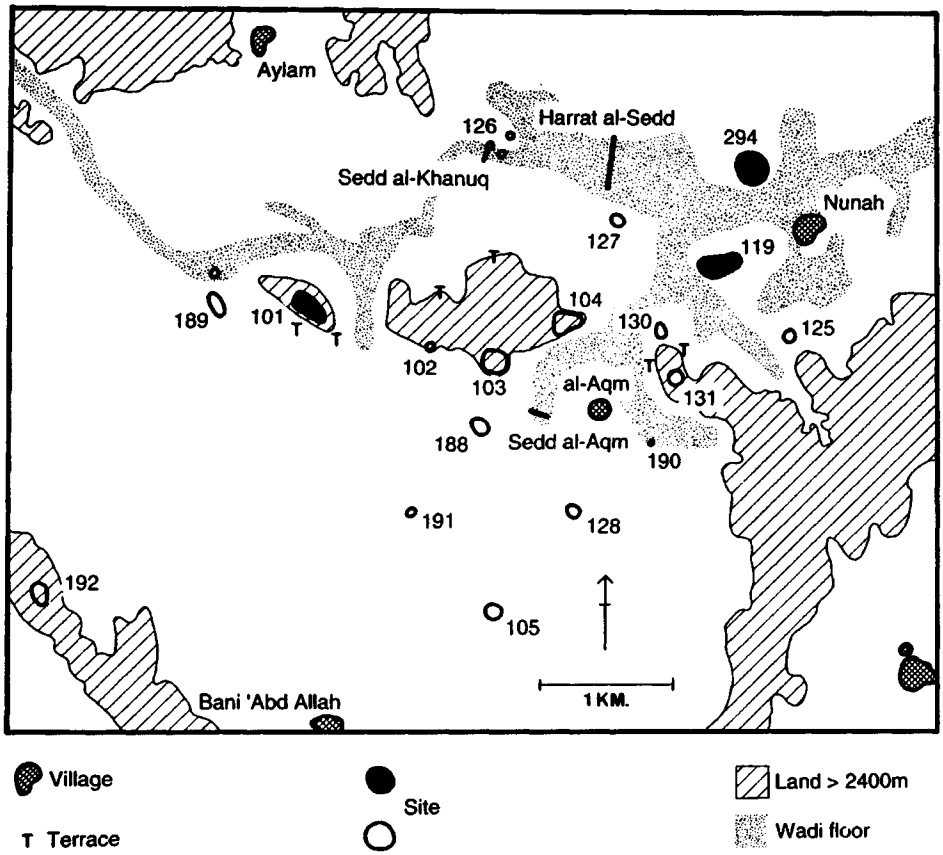

Figure 11. Area of Hammat al-Qa and dams associated with Himyarite settlement around Nunah

These eight inscriptions provide a valuable impression of aspects of the administration and construction of water supply systems. In addition it seems that some inscriptions can be dated by their style of writing to earlier than the Himyarite period, and in fact several appear to have been cut during the last few centuries BC.

Islamic: By 1998, 87 Islamic sites had been recorded, making this the most densely settled period of all. Furthermore, because many existing villages have probably been occupied for several centuries, we must assume that the existing pattern of villages must merge with occupations of the later and middle Islamic periods. Unfortunately, although we are able to recognize the broad types of Islamic pottery, finer subdivisions still elude us.

With the exception of the major late Islamic capital of Dhawran located in the western part of the region, most Islamic sites are unexceptional both in scale and in terms of monumental architecture. Dhawran has the remains of a massive mosque, ablution, and funerary complex. Being the capital of Yemen in the time of al-Mutawakkil (AD 1644–1676), Dhawran is a site of considerable importance and is currently being recorded by a joint American, French, and Yemeni architectural project sponsored by the American Institute for Yemeni Studies. In general, the Is-

lamic period is characterized by a dense scatter of villages located in virtually all topographic locations. Although some dams continued in use into the Islamic period, many such as Sedd al-Ajma and Sedd Adhra'ah were probably breached and heavily damaged by mid-Islamic times and therefore ceased to function in terms of irrigation.

To conclude, we can now see that by the late third millennium BC population in the Dhamar region was already rather dense, and small walled towns of up to 4–5 ha had started to appear on the plateau. Similar towns became increasingly common in the Iron Age, when large agglomerated settlements were up to 15–20 ha in area. Although the Himyarite period may represent the height of formal "civilization," with more monumental architecture, dams, and other landscape features, survey evidence suggests that population continued to increase after this. Consequently, it may only have been during the Islamic period that population pressure might have led to the extremely densely settled and terraced landscape that is now evident in much of the area.