

THE CENTRAL LIMES ARABICUS PROJECT: THE 1982 CAMPAIGN

by
S. Thomas Parker

Introduction

The Central *Limes Arabicus* Project is a long-term investigation of the sector of the ancient Roman fortified frontier east of the Dead Sea. The primary purpose of the Arabian *limes* was to control the movement of goods and people between the Empire and the Arabian peninsula and especially to control the incursions of nomadic Arab tribes that inhabited the desert east of the frontier. During the early Principate the security of the southeastern frontier of the Roman Empire was provided by the Nabataean client kingdom. Trajan's annexation of Nabataea in A.D. 106 brought the Romans face to face with the problems of controlling a long desert frontier. By 114 Trajan had completed a major trunk road, the *via nova Traiana*, that extended for ca. 360 kms. from the borders of Syria to the Red Sea. A chain of forts, some reoccupied Nabataean posts, others of Roman construction, spaced at intervals along the *via nova* formed the initial framework of the *Limes Arabicus*.¹ This essentially linear defense was maintained by the Romans for the next two centuries.² The Arabian frontier protected a large sedentary population in Palestine and Transjordan (including the cities of the Decapolis), the lucrative caravan routes between Arabia and the Empire, and the

Palestinian land bridge that connected the two most important Roman provinces in the East: Egypt and Syria.

During the third century the Roman Empire experienced a serious crisis. Civil wars, external invasions, depopulation, and major economic problems beset the Empire. Portions of the eastern provinces were repeatedly ravaged by Persian armies and were temporarily occupied by the rebellious state of Palmyra. Aurelian destroyed Palmyra in 273, but it was Diocletian (284-305) who finally restored political stability to the Empire and began a thorough reorganization of the imperial frontiers. A major victory over Persia in 298 resulted in the advance of the Roman frontier in Mesopotamia east of the Tigris. In Syria, the frontier from the Hauran to the Euphrates was guarded by the *Strata Diocletiana*, the heart of the fortified zone of forts, watchtowers, and roads.³ In Transjordan, a surface survey conducted by the author in 1976 suggested that a major buildup of fortifications occurred in the Diocletianic era along the Arabian frontier, where the number of fortified sites approximately doubled. The linear defense of the Principate was abandoned in favour of a defense in depth along most of the frontier. The Arabian *limes* was now a broad fortified zone, 20-30 kms. in

¹ S. Thomas Parker, Archaeological Survey of the Limes Arabicus: A Preliminary Report, *ADAJ*, 21 (1976) 19-31; Parker, Towards a History of the Limes Arabicus, p. 865-878 in W. S. Hanson and L. J. F. Keppie, eds. *Roman Frontier Studies 1979*, Oxford: British Archaeological Reports, 1980. For additional treatments of the Arabian frontier, cf. G. W. Bowersock, Limes Arabicus, *HSCP* 80 (1976) p. 219-229; David F. Graf, Saracens and the Defense of the Arabian Frontier, *BASOR* 229 (1978) p. 1-26; D. L. Kennedy, *Archaeological Explorations of the Roman Frontier in North-East Jordan*, Oxford, 1982.

² One exception to the linear posture was in the northern sector, where a chain of forts well east of

the *via nova* guarded the northwestern outlet of the Wadi Sirhan. Cf. S. Thomas Parker and Paul M. McDermott, A Military Building Inscription from Roman Arabia, *ZPE*, 28 (1978) p. 61-66; D. L. Kennedy, The Frontier Policy of Septimius Severus: New Evidence from Arabia, p. 879-887 in W. S. Hanson and L. J. F. Keppie, *Roman Frontier Studies 1979*, Oxford: British Archaeological Reports, 1980).

³ A Poidebard, *La Trace de Rome dans le désert de Syrie. Recherches géométriques (1925-1932)* 2 vols., Paris: Geuthner, 1934; Denis van Berchem, *L'armée de Dioclétien et la réforme constantinienne* Paris: Geuthner, 1952, p. 10-17.

depth. The central sector of the frontier, i.e., the region east of the Dead Sea, received the bulk of the new fortifications (Fig. 1). For about two centuries the forts of the Diocletianic *limes* remained occupied, but in the late fifth and sixth centuries there is clear evidence that most of these forts were abandoned, including nearly all in the central sector.⁴ Primary defensive responsibility for the southeastern frontier was turned over to Arab federates, who were unable to contain the explosion of Muslim tribes from Arabia in the early seventh century. The Muslim conquest of Transjordan, Palestine, and Syria opened a new epoch in western history.

The Central *Limes Arabicus* Project, therefore, seeks to answer two principal historical questions:

- 1) What can explain the dramatic military buildup in the central sector of the Arabian frontier about A.D. 300?
- 2) What can account for the apparent abandonment of most of these fortifications about two centuries later?

In order to address these principal questions the project is organized around five biennial field campaigns in the even numbered years between 1980 and 1989. The central frontier is being examined through full scale excavation of the Roman legionary fortress at el-Lejjūn, the most important site in the sector, limited soundings of *ca.* six smaller forts and watchtowers (three have been sounded to date), intensive survey of the *limes* zone itself, and survey of the desert fringe immediately east of the frontier in an effort to learn something of the nomadic opponents of the Romans.

The project began field work in 1980.⁵ The 1982 campaign was conducted between June 6 and July 29, under a permit kindly granted by the Department of Antiquities of Jordan. The project is

sponsored by North Carolina State University and is affiliated with the American Center of Oriental Research (ACOR) in Amman. Principal funding for the 1982 season was provided by the National Endowment for the Humanities on a gifts and matching basis. Additional funding was provided by the Department of Antiquities of Jordan, the Dumbarton Oaks Center for Byzantine Studies in Washington, D.C., student fees, and several private donors. The author wishes to express his gratitude to all these organizations and individuals for their support. A special debt is owed to Dr. Adnan Hadidi, Director of the Department of Antiquities, Dr. David W. McCreery, Director of ACOR, and Mr. Dhyab al-Yousef, Governor of the Kerak District, for invaluable advice and assistance.

Senior staff included Dr. S. Thomas Parker of NCSU as director, stratigrapher, and pottery specialist, Dr. Bert DeVries of Calvin College as architect/surveyor, Dr. Frank L. Koucky of Wooster College as geologist and director of the survey, Mr. Scott Rolston of Yarmouk University as human osteologist, Dr. Vincent A. Clark of ACOR as Semitic epigrapher and team leader of the desert survey, Mr. Michael Toplyn of Harvard University as faunal analyst (Dr. Ilse Köhler provided preliminary interpretation of faunal remains in the field in 1982), Dr. John Wilson Betlyon of Smith College as numismatist, Dr. Patricia Crawford of Boston University as paleo-botanist, Ms. Jennifer Groot as object specialist, Dr. Sallie S. Fried of Brown University as draftsperson, Mr. Eric Green of NCSU as photographer, and Ms. Martha Jane Newby of the University of Montana as camp manager. Area supervisors were Dr. Anne E. Haeckl of the University of Colorado (Area A—the *principia*), Ms.

⁴ Parker, *ADAJ*, 21 (1976) p. 26-28; Towards a History, p. 873-874.

⁵ For preliminary reports on the 1980 season, cf. S. Thomas Parker, The Central Limes Arabicus Project: The 1980 Campaign, *ADAJ*, 25 (1981) p. 171-178; The Central Limes Arabicus Project: The 1980 Campaign, *ASOR Newsletter*, 8 (1981) p. 8-20; Preliminary Report on the 1980 season of

the Central Limes Arabicus Project, *BASOR*, 247 (1982), p. 1-26. A summary of knowledge about Lejjun and its garrison unit prior to the beginning of excavation is presented in S. Thomas Parker and James Lander, Legio IV Martia and the Legionary Camp at el-Lejjun, *Byzantinische Forschungen*, 8 (1982), p. 182-210.

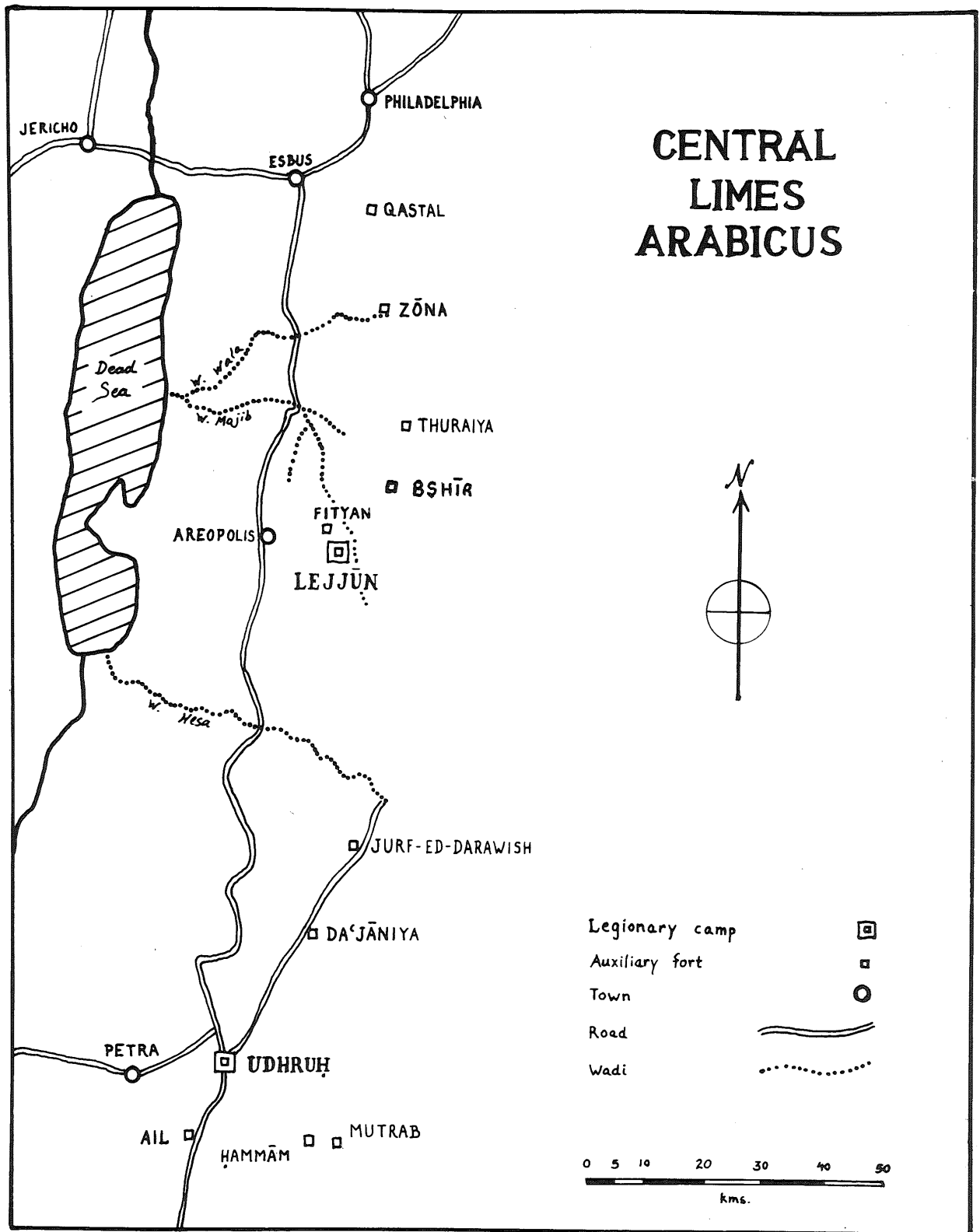


Fig. 1

Jennifer Groot (Area B—the barracks), Mr. Robert Schick of the University of Chicago (Area C—the fortifications), Mr. Scott Rolston (Area F—the cemetery and soundings), Dr. Patricia Crawford (Area G—the *vicus* building), and Dr. Vincent A. Clark (Area H—Qasr Bshir).⁶

The following brief report presents a summary of the results of the 1982 campaign in preliminary form. It includes a tentative stratigraphic outline, results from the areas excavated within the Lejjūn fortress, soundings within the Lejjūn valley, soundings at Qasr Bshir, the survey, and the signaling experiment. Finally, some tentative historical conclusions are drawn that attempt to shed some light on the major historical questions outlined above.

Excavation of the Lejjun Legionary Fortress

A) Stratigraphic Summary

The first season of excavation in 1980 established a basic stratigraphic sequence based on numismatic and ceramic evidence.⁷ Results from the 1982 campaign permit a slightly more refined stratigraphic picture:⁸

<i>Stratum</i>	<i>Period</i>	<i>Approximate Dates</i>
VII	Early Roman	ca. 63 B.C.-A.D. 135
Post Stratum VI Gap	Late Roman I-III	ca. A.D. 135-284
VI	Late Roman IV	ca. 284-324
VB	Early Byzantine I	ca. 324-363
VA	Early Byzantine II	ca. 363-400
IV	Early Byzantine III-IV	ca. 400-500
III	Late Byzantine I-II	ca. 500-551
Post Stratum II Gap		ca. 551-1910
II	Late Ottoman	ca. 1910-1918
I	Modern	ca. 1918-

⁶ Student staff included Michael Brasche, Kim Bryant, Stephanie Damadio, Susan B. Downey, Karen Dubilier, Ann Grabhorn, Victoria Godwin, Erik Harrell, Nelson Harris, Bradley Hunter, Laura Hess, John Lampe, Joy McCorriston, Tom McGimsey, Be Moore, Katy Old, Laurie Tiede, and Janet Wollam. Susan Downey and Karen Dubilier served as pottery registrars; Ann Grabhorn acted as pottery restorer. Tom McGimsey served as assistant architect.

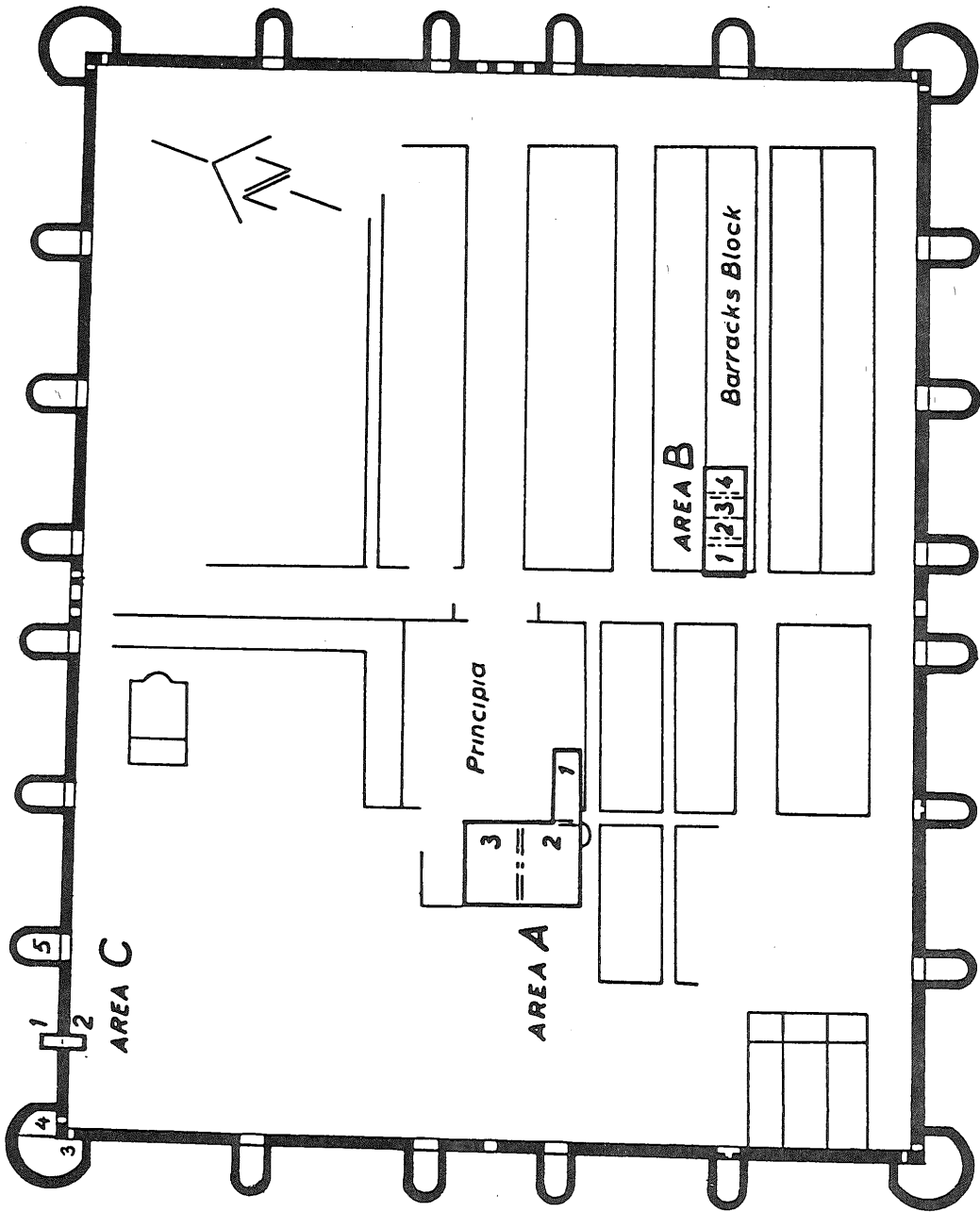
⁷ Cf. Parker, *BASOR*, 247 (1982), p. 3-5.

B) Plan of the Fortress

It has long been supposed that Lejjūn was the base of *legio IV Martia*. Although this identification seems increasingly likely, it has still not been proven by the recent excavations. The fortress (Fig. 2) measures 242.00 m. x 190.00 m. and covers an area of ca. 4.6 ha. (ca. 11 acres). One gate is located in the middle of each wall. Two major streets intersect at a right angle in the middle of the fortress: the *via principalis* extends from the north gate to the south; the *via praetoria* extends from the east gate to bisect the *via principalis* at the *groma*, the exact centre of the fortress. At the intersection of the two main streets is the *principia* or headquarters building. The entire eastern half of the fortress is devoted to barracks blocks. The fortress is protected by an enclosure wall 2.40 m. in thickness and studded with projecting towers: four circular angle towers and twenty U-shaped interval towers.⁹ Excavation within the fortress in 1982 continued in three areas opened in 1980: the headquarters building, a barracks block, and the fortifications.

⁸ The following periodization is based on James A. Sauer's chronology for the later periods of Palestinian history, cf. *Heshbon Pottery 1971*, Berrien Springs, MI, Andrews University, 1973 p. 1-7. The one refinement in the stratification of Lejjūn presented here is the subdivision of Stratum V (Early Byzantine I-II) into two phases (VA, VB) separated by the earthquake of 363.

⁹ For a detailed discussion of the plan and architectural features of Lejjūn, cf. Parker and Lander, *BF*, 8 (1982) p. 188-199.



L.80 areas A, B & C EL-LEJJÜN FORTRESS

Plan adapted from Brünnow & Central Limes Arabicus Project
 von Domaszewski, FA, vol. 2

architect: bert de vries



Fig. 2

C) The Principia (Area A)

The headquarters building (63.00 m. x 52.50 m.) is paralleled by many such structures throughout the Empire. The main entrance through the eastern wall gives access to a large central courtyard (Fig. 3). Subsidiary entrances are located in both the north and south walls. The principal range of official rooms is located along the western wall, including administrative offices and the *aedes* or shrine of the legionary standards. Primary goals of excavation in the *principia* are to recover its architectural plan, reconstruct its occupational history, and provide any evidence regarding the identity, origin, and internal organization of the garrison unit of the fortress. The large squares opened in 1980 along the southern and western walls of the building were continued this season. In square A.1, along the southern wall, removal of massive earthquake collapse was completed, exposing a beaten earth surface of early sixth century (Stratum III) date. The discovery of two piers with collapsed arches suggested that the courtyard was once flanked on the north and (presumably) south sides by a monumental arcaded portico of arches supported by piers. The portico was roofed by tiles (literally thousands were recovered in this square).

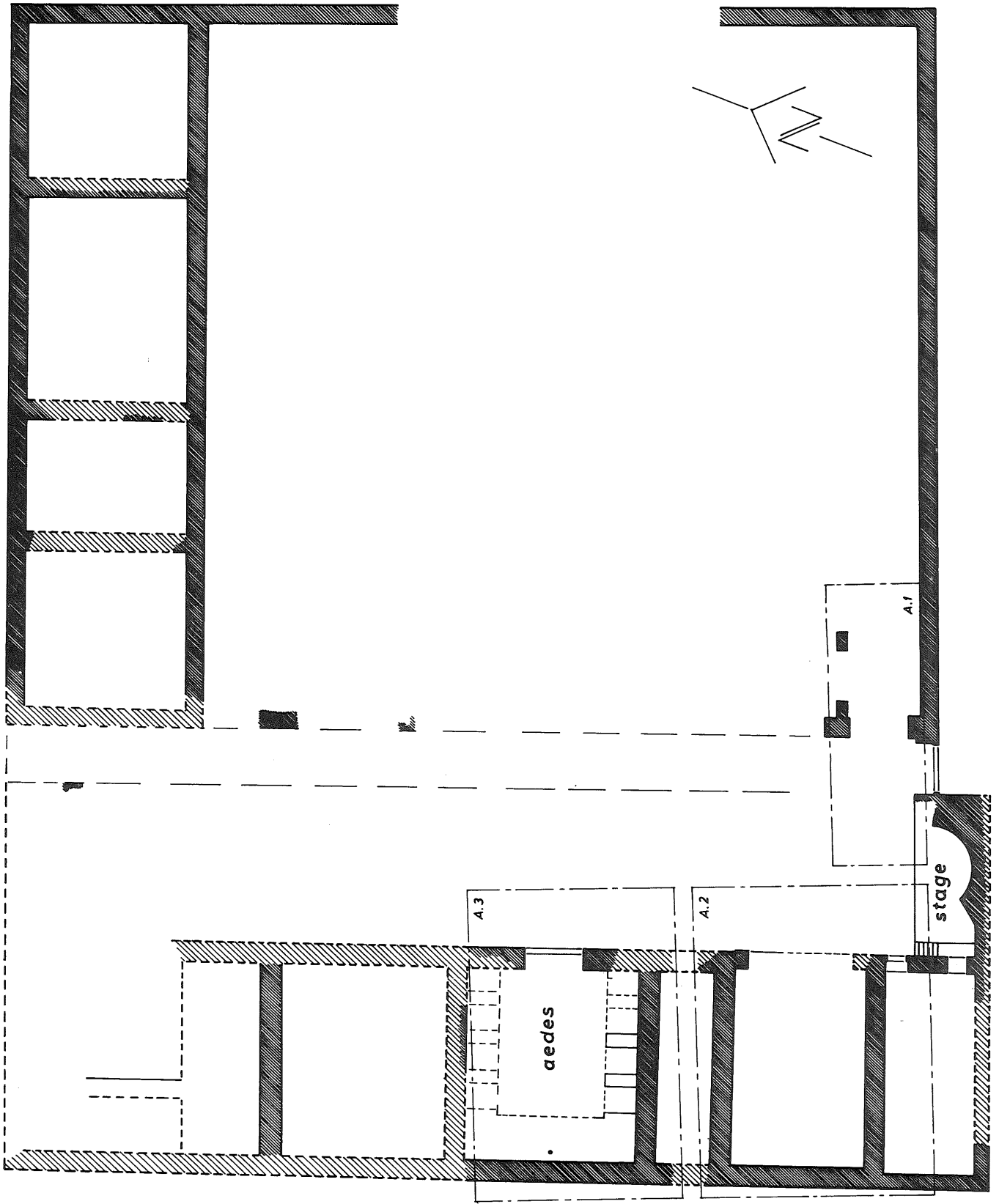
In square A.2, comprising the southwestern corner of the *principia*, a staircase was found that gave access to the raised podium with its apse discovered in 1980. The apse, first interpreted as a *schola* by Domaszewski, seems rather to have served as a *rostrum* or speaking platform from which the legionary prefect could address small groups of soldiers. There was some architectural evidence which suggested that the area between the north and south subsidiary entrances may have been a *basilica* or transverse hall separating the main courtyard to the east from the range of official rooms to the west. Though this interpretation is tentative, it is supported by similar plans in headquarters buildings throughout the Empire. Three entrances found within A.2 connected the *basilica* with the official

rooms to the west. Dramatic evidence of earthquake collapse within the one room was provided by the fall of one wall with nearly all its coursing still closely aligned. Recovery of Late Byzantine (Stratum III) material under this wall suggested that it fell during the earthquake of 551.

Important architectural evidence was also encountered in the *aedes* or legionary shrine (A.3). Removal of tumble and wall collapse had exposed the monumental (3.00 m. wide) entrance with its iron gate in 1980; this season's work revealed a series of barrel vaults along the south, west, and (possibly) north walls. The vaults presumably supported an elevated podium along three sides of the *aedes*. A raised pier was found on the podium along the western wall, exactly aligned with the middle of the eastern entrance. The hole in this pier and bits of gold foil recovered within it suggested that it served as the legionary standard base. The vaults themselves may have served as the legionary bank (a well attested function of the *aedes* elsewhere) but this assumption must await excavation of the vaults next season.

D) The Barracks (Area B)

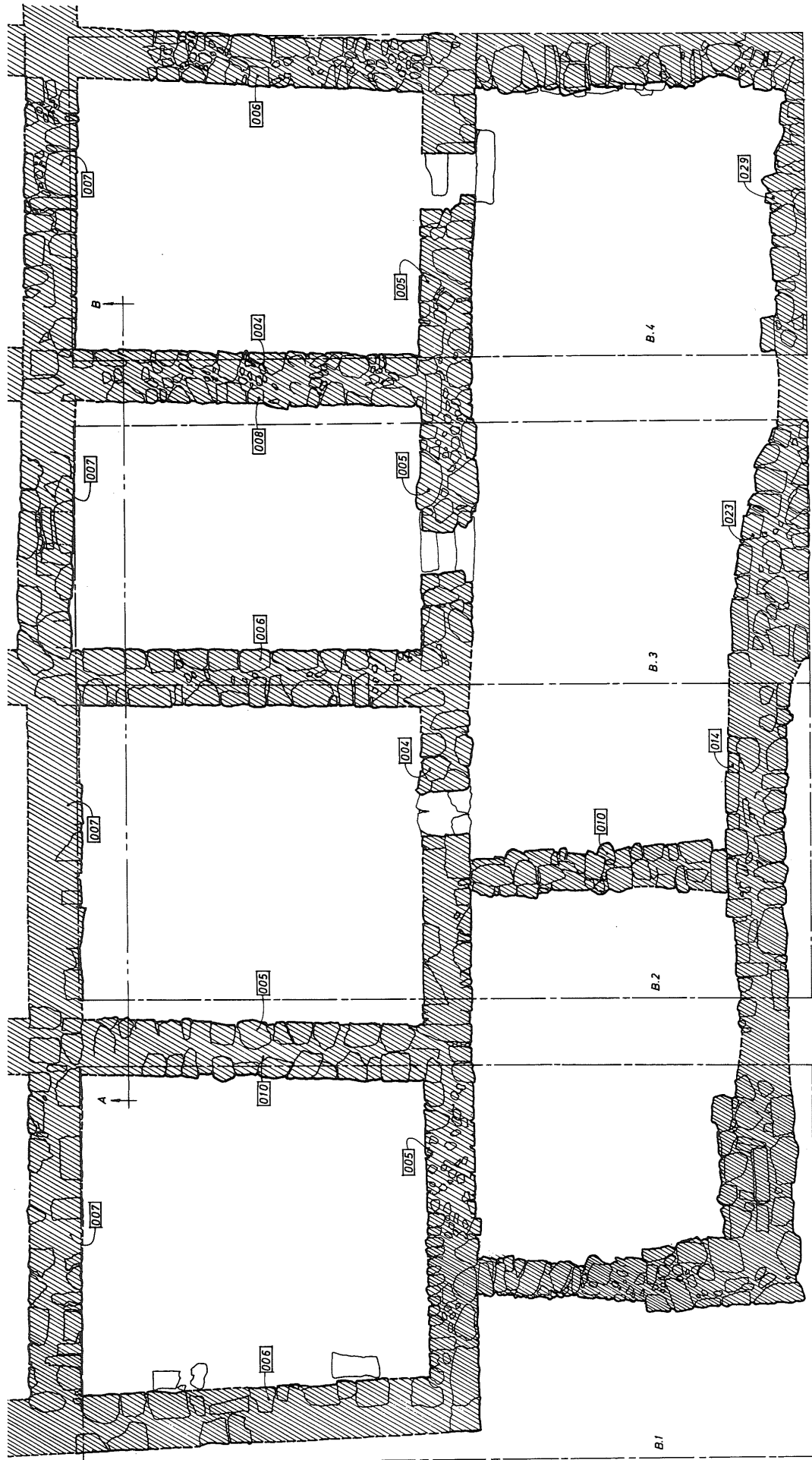
Primary goals in the barracks were to elucidate the plan of several rooms within one typical block (block 'B', see Fig. 4), obtain a complete stratigraphic profile of the history of the fortress, and retrieve cultural data on the Roman frontier legionary of the fourth and fifth centuries. The four squares (B. 1-4) opened in 1980 were continued this season. Domaszewski's plan of block B, with eighteen pairs of rooms along either side of a central spine wall, had already been brought into question by the 1980 excavation. Although the inner (northern) row of rooms corresponded to Domaszewski's plan, the outer (southern) rooms appeared to be courtyards of irregular size. The two westernmost inner rooms were of larger size (5.20 x 4.85 m.) than the other rooms (5.20 x 4.00 m.) and were presumably a centurion's quarters. The smaller rooms probably each housed one *contubernium* of eight common



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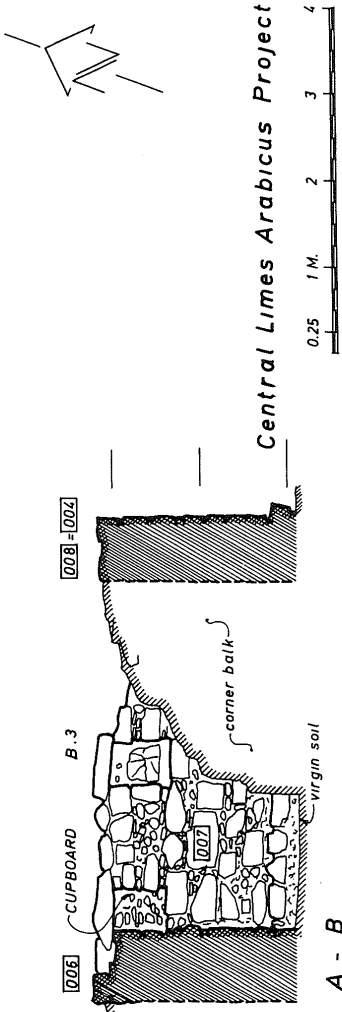
PRINCIPIA

L.82 Area A



L.82 Area B
BARRACKS ROOMS

drawn by
Bert DeVries & Tom McGimsey



section
A - B
Fig. 4

Central Limes Arabicus Project

soldiers. Excavation in 1980 also revealed that each inner room was roofed by a series of three parallel limestone arches which supported oblong roofing beams covering the gaps between the arches. Excavation of three interior rooms to sterile soil was completed this season (B.2 3, 4). Two of the exterior courtyards (B.2 and B.3) were also completely excavated.

The most important discovery of the 1982 season in the barracks was the appearance of earlier limestone wall foundations, not aligned with the extant barrack walls; these earlier foundations apparently formed the original barracks in the Late Roman period (Stratum VI). These barracks had been completely demolished sometime in the fourth century, perhaps as a consequence of the 363 earthquake, which is known to have been severe locally.¹⁰ The barracks were rebuilt along the same basic plan but with smaller interior rooms. Unfortunately, this destruction and rebuilding removed most stratification of the earliest strata (VI, VB) of the barracks' history. To date, Late Roman stratification has appeared only in the south courtyard of B.3, which contained a series of three superimposed floors associated with the earlier Late Roman walls.

In the Early Byzantine period the south courtyards in all four squares reflect heavy domestic occupation. A series of superimposed floors with many pits suggest that the courtyards were used for the preparation, cooking, and eating of meals. The legionary diet in the fourth and fifth centuries included such plants as barley (probably also used as animal fodder), dates, grapes, olives, and lentils.¹¹ The most common meat animals were sheep and goat, followed by chicken, cattle, and pig. One pit in B.2 contained charred bones of several of these species and about a dozen eggshells. Unlike some Roman frontiers such as Britain, where *venatores* (professional hunters) supplemented the meat diet with wild game, there is little evidence at Lejjun that hunting contributed to the diet. Dung

appears to have been the most widely used fuel, though wood, reeds, and sedges were also exploited. Evidence of metal-working appeared in the south courtyard of B.1. A group of pits contained iron slag and a number of metal objects, including spearpoints, blades, spikes, nails, rods, clips, and hooks. Evidence of such activity in the courtyard of B.1 ended before the Late Byzantine (early sixth century) period.

Much simpler stratigraphy appeared in the north rooms of B.2 3, and 4. A single plaster floor resting on nearly sterile fill was encountered in each room. Ash, sometimes in several recognizable layers, covered these floors. The ash in turn was found under *ca.* 2.00 m. of massive roof and wall collapse, probably resulting from seismic activity. Apparently all three interior rooms collapsed by the end of the Early Byzantine period, perhaps due to the earthquake of 500.

The interior room of B.1, part of the centurion's quarters, not surprisingly was better furnished. A well-laid flagstone floor was found in the southeast corner. In the southwest corner was a large storage installation; abutting this installation along the west wall of the room was a rectangular bench. Many fragments of cooking pots were found imbedded or resting on this bench. Unlike the other north rooms of the barracks, excavation of B.1 was not completed before the end of the season.

The Late Byzantine (Stratum III) occupation of the barracks, following the devastating earthquake of 500, was marked by limited reconstruction and reoccupation. No attempt was made to clean out or reconstruct the north rooms of B.3 or B.4. In the B.1 centurion's quarters two of three roofing arches had collapsed. A thick fill of dung and *huwwar* was simply laid over the rubble and a rather carelessly applied *huwwar* floor covered the fill. The interior was then used for storage, as the large number of Late Byzantine storage jar fragments suggested. The south courtyards in all four squares continued in use;

¹⁰ Kenneth W. Russell, *The Earthquake of May 19, A.D. 363*, *BASOR*, 238 (1980) p. 47-64.

¹¹ Wheat has not yet been found in a securely controlled context of this period, but its inclusion in the diet seems possible.

several rather poorly built walls were erected along with some domestic installations, such as a mill and hearth in B.4. The metal-working industry in the south courtyard of B.1 definitely continued into this period. All this activity was ended by the earthquake of 551.

E) The Fortifications (Area C)

The major goal in Area C is to sample each component of the fortifications of the fortress: the enclosure wall itself, an angle tower, an interval tower, and a gateway. A trench through the enclosure wall near the northwest corner of the fortress was completed in 1980. This season it was decided to excavate the northwest angle tower and the interval tower immediately to the east along the north wall (Fig. 5).¹² The U-shaped interval tower was investigated through a trench (C.5) which bisected the structure on its north-south axis. The tower, originally of two stories, measured *ca.* 10.80 x 9.00 m. It was entered via a recessed doorway built into the enclosure wall. Although the entire second story had been robbed or collapsed, the pitch of the upper walls of the first story suggested that it was roofed by a barrel vault that supported the upper story. The walls of the tower were bonded into the enclosure wall, clearly indicating that the towers and the enclosure wall were of contemporary construction. Both the tower walls and the enclosure wall were constructed of similar material: the lower courses of roughly cut chert, the upper courses of well-dressed limestone. Excavation of the tower revealed the entire doorway to the ground floor: the lintel, doorposts, and threshold, all of dressed limestone, survived intact. Unfortunately, substantial reuse of the tower in relatively modern times had apparently removed most of the ancient stratification.

The northwest angle tower is a massive structure, *ca.* 16.00 m. in diameter and originally of three stories. Excavation in 1982 was confined to the northeast and southeast rooms. Work was slowed by

numerous bedouin burials. At least sixty mostly disarticulated individuals were found; a rich array of artefactual material was associated with these burials, including coins which suggested that the tower was used for burials in the Mamlūk and Ottoman periods (1263-1918). The southeast room contained a winding staircase built around a central pier, completely excavated this season. A doorway at ground level provided access into the tower from inside the fortress. A long corridor led from this doorway to three more doors at ground floor level that gave access into the northeast, northwest, and southwest rooms of the tower's ground floor. The corridor then turned a corner that led up a series of stairs and landings to the upper stories. Further excavation is planned in both towers in the next season. In addition to the excavation of the two towers this season, the exterior face of the enclosure wall connecting the towers was cleared, exposing an entire stretch of the fortifications.

Soundings in the Lejjūn Valley (Fig. 6)

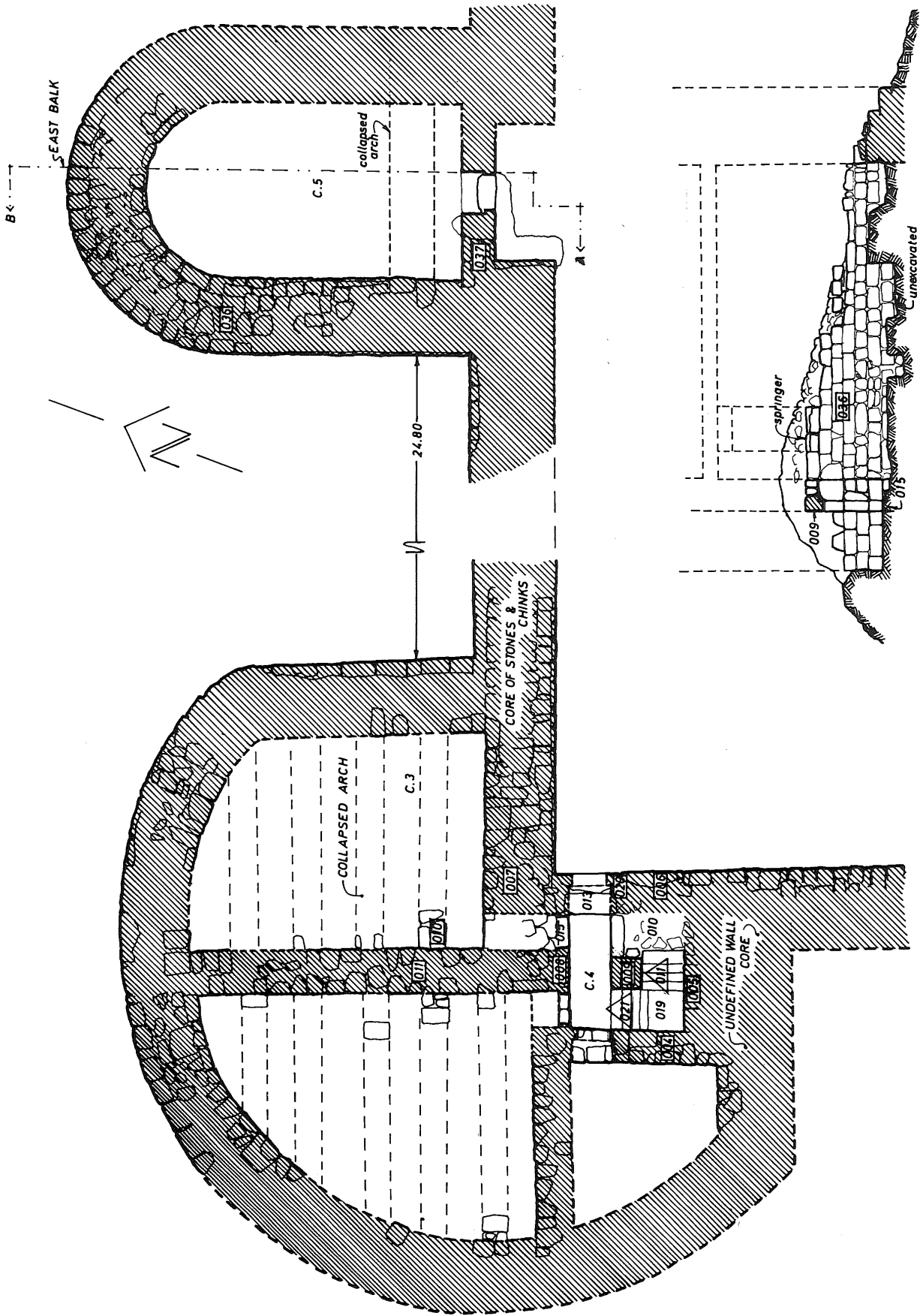
A) Structure in the Western Vicus (Area G)

An extensive civilian settlement (*vicus*) grew up around the legionary fortress. The *vicus* was a typical feature of Roman military establishments; it supplied the local garrison with various services and housed merchants, discharged veterans, and families of the soldiers. The project plans to investigate several structures of the *vicus* in order to gain a better understanding of the relationship between soldier and civilian. In 1982 extensive soundings of a major structure in the western *vicus* were conducted (Fig. 7).

The building (35.00 x 28.00 m.) is rectangular in plan and consists of ranges of rooms enclosing a central courtyard. The single entrance is located in the middle of the eastern wall, nearest the fortress. A plan based on surface measurements was drawn in 1979 and has been

¹² The northwest angle tower is tower VI on Domaszewski's plan; the interval tower is VII. Cf. R. Brünnow and A. von Domaszewski, *Die*

Provincia Arabia, 3 vols., Strassburg: Trübner, 1904-09, v. 2, 24-38, for the best early discussion of the site.



L.82 Area C

ANGLE & INTERVAL TOWERS

drawn by Bert De Vries & Eric Green

section A-B

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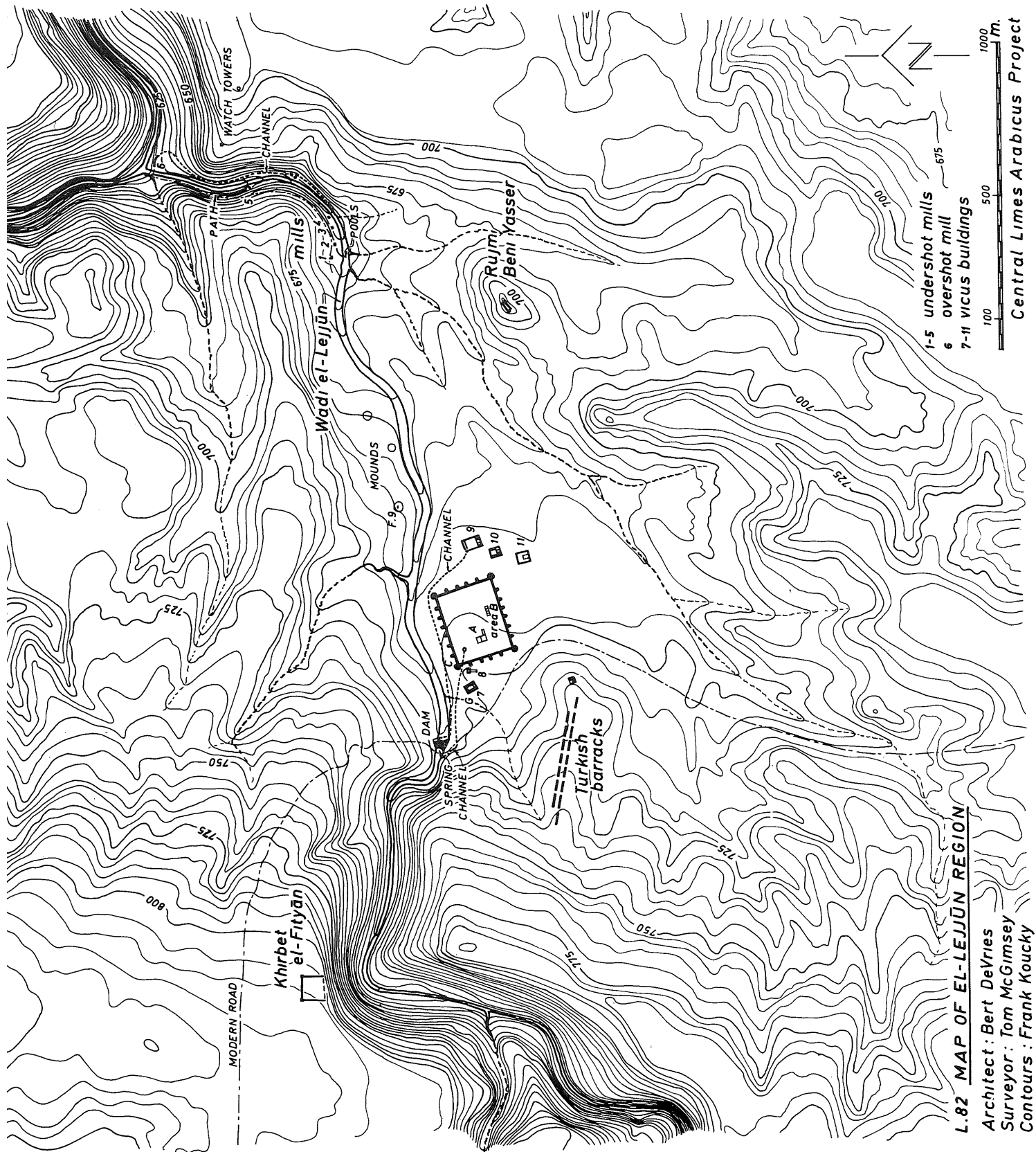
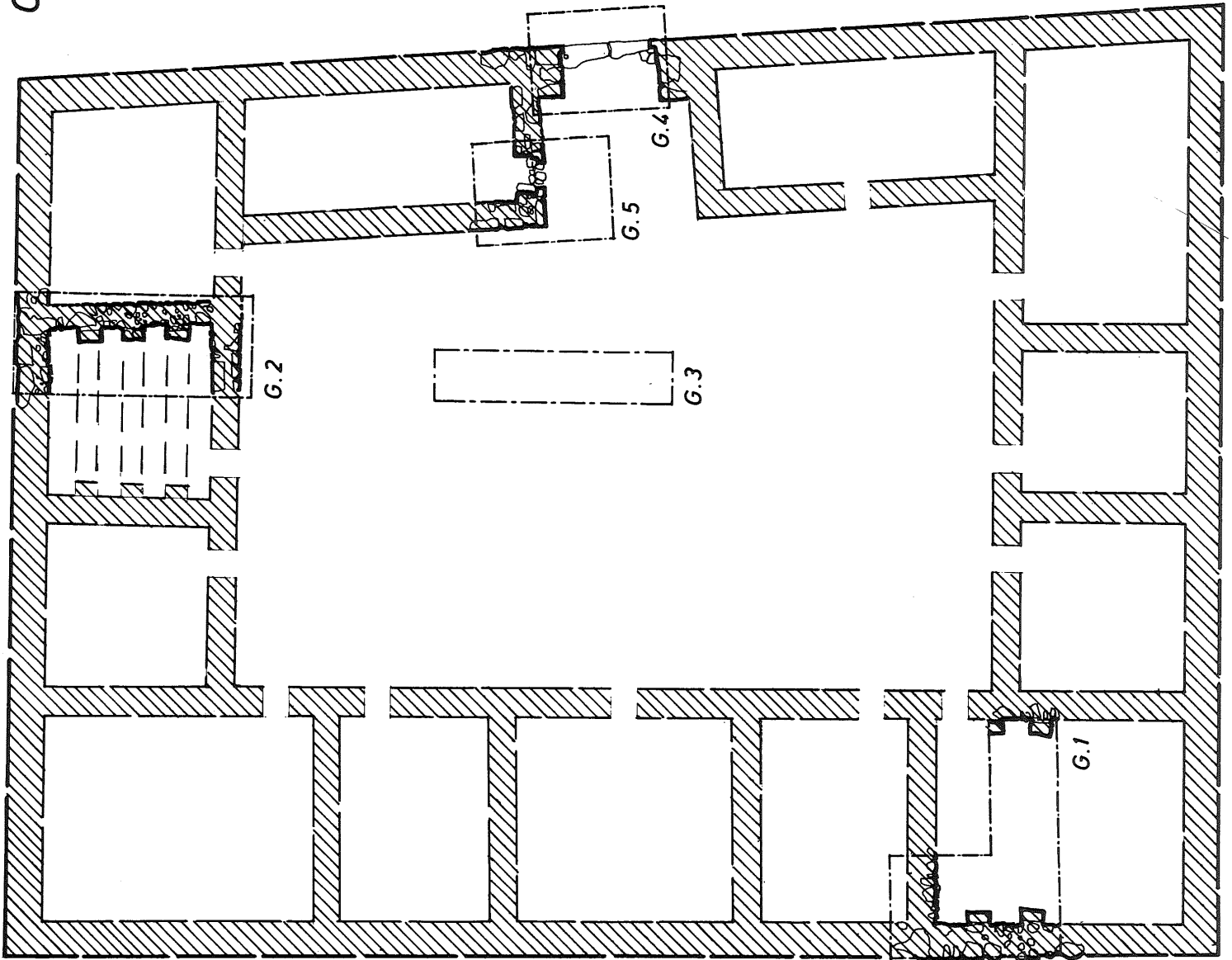
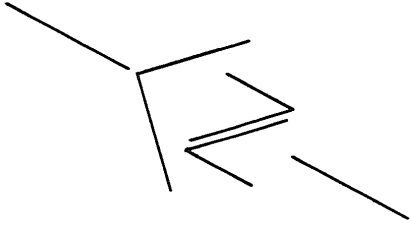


Fig. 6

Central Limes Arabicus Project



L.82 Area G

VICUS BUILDING No.7

Overall plan adapted from
a survey by Jim Lander

Architect: Bert DeVries

Surveyor: Tom McGimsey

published elsewhere.¹³ In 1982 five probes were opened to date the building and determine its function. The probes were located in one large room in the southwestern corner (G.1), one smaller room along the northern wall (G.2), the central courtyard (G.3), the gateway (G.4), and a room opening into the gateway (G.5).

A similar stratigraphic picture emerged in each room: under massive roof and wall collapse were a thin occupation layer and a single *huwwar* floor. Under the floor was sterile soil. Two of the rooms (G.1 and G.2) were roofed by a series of parallel limestone arches supported by piers. The piers abutted the room walls; both the piers and the walls showed evidence of plastering. Evidence of a relatively brief occupation also appeared in the courtyard probe which, apart from a single ash lens, was completely sterile. The probes of the gateway and its adjoining room also produced a single occupation surface. Pottery from all the probes was uniformly Early Byzantine. This dating was supported by the numismatic corpus of eleven datable coins, all of which dated to the fourth century.

Apparently the building was constructed in the fourth century (Stratum V), perhaps shortly after the erection of the legionary fortress. The plan of the structure, its limited access, and the relative paucity of artefactual evidence suggested that it may have served as a *mansio*, or hotel for travellers. The building could have provided a relatively secure resting place for merchants or government officials with its single gate and location within bowshot of the fortress. The single floor within each room suggested that the building had a relatively brief occupational history, clearly ending no later than the early fifth century. Its destruction was apparently so thorough that no subsequent attempt was made to rebuild or reoccupy the building. More precise dating of the building awaits closer study of the numismatic and ceramic evidence.

B) Installations in the Wadi Lejjūn and

Search for the Cemetery (Area F)

North of the *wadi* a series of three small mounds extends along the north bank, northeast of the fortress. Surface pottery collected from the mounds suggested their contemporaneity with the legionary fortress, although two also produced Nabataean (Early Roman, Stratum VII) sherds. One of these later mounds was selected for sounding in order to determine its occupational history and function. A trench (F.9) situated on its eastern side revealed two parallel wall lines of small, roughly cut stones. The extremely limited amount of artefactual material made any interpretation tentative, but the structure may have served as one of a series of watchposts that guarded the fortress, *vicus*, and *wadi* installations from the north.

Survey of the *wadi* in 1980 had revealed a complex system of hydrological features, including upper and lower dams and three undershot watermills. This season two more undershot mills were discovered as well as a water channel along the opposite bank from the mills. The structure identified as the "lower dam" in 1980 may actually be an overshot mill. In an effort to date the system, a sounding (F.16) was laid out in one of the mills. It produced only limited material, but several sherds of Late Roman date were recovered. More evidence is needed to illustrate the relationship between the water system and the fortress.

A renewed effort was made in 1982 to locate the ancient cemetery associated with the fortress. Several soundings were laid out in promising areas of the valley. Dr. Bruno Frohlich of the Smithsonian Institution joined the team for several days to search the valley with a resistivity monitor. Unfortunately, these efforts proved fruitless and no ancient, unrobbed tombs were discovered. Two tombs consisting of a central chamber and *loculi* were found cut into the south bank of the *wadi* east of the fortress; but these tombs were completely robbed and were in use as animal stables.

¹³ Parker, in the *ASOR Newsletter*, p. 12, fig. 4; Parker and Lander, *BF*, 8 (1982) pl. XXI.

Soundings of Qaṣr Bshīr (Area H)

In addition to large scale excavation of Lejjūn, the largest Roman military site in the central sector of the Arabian frontier, the project also is conducting soundings at several smaller military sites in the region. In 1980 such soundings were completed at the *castellum* of Khirbet el-Fityan and the watchtower complex of Rujm Beni Yasser.¹⁴ This season Qaṣr Bshīr, a *castellum* located 15 kms. northeast of Lejjūn was selected for excavation. Bshīr was known as a contemporaneous site with Lejjūn on the basis of its building inscription of A.D. 306 and surface pottery collected in 1976.¹⁵ The fort was presumably occupied by an auxiliary unit but was abandoned by the end of the fifth century. It was hoped that soundings would yield a corpus of artefactual material for comparison with the legionary fortress, a complete stratigraphic history of the fort, and perhaps some evidence relating to the type of garrison unit.

The fort is a classic Diocletianic *quadriburgium*, measuring ca. 56.00 m. square. Four large square towers of three stories project from the corners; two smaller square interval towers flank the main gate in the southern wall. The vaulted gateway leads into the central courtyard, which is surrounded on all sides by ranges of rooms, presumably barracks, of two stories. The water supply of the fort was secured by two cisterns within the fort, several exterior cisterns, and a large reservoir.

One probe (H.1) was opened in the southwest corner of the central courtyard to encompass an arched entrance into the barracks. A second probe (H.2) was laid out in the corner of a barracks room in the southern wall, west of the gateway. A notable discovery in H.1 was the recovery of Umayyad pottery from rubble under topsoil. This was the first evidence of post-Byzantine use of the fort, although the context of the material and the lack of similar pottery from both the H.2 probe and surface sherding suggested that the

Umayyad occupation was not extensive. Under the Umayyad stratum was a series of superimposed soil and ash layers, all dated to early Byzantine I-II (Stratum V) by pottery and a coin of Constantius II (A.D. 347/8). The four bottom loci were clearly occupation layers, rich in sherds and animal bones. These layers in turn rested upon a plaster floor which marked the limit of excavation this season.

Probe H.2 encountered several layers of tumble alternating with ash lenses, resulting from the burning of dung. All these layers produced Early Byzantine pottery (and a coin dated ca. 340-365) and rested on a leveling fill overlying bedrock. The large amount of animal bone (including horse and camel) and apparent mangers built into the back wall of this room (and most other ground floor rooms of the fort) suggested that Bshir was garrisoned by a cavalry unit. The soldiers may have been housed on the upper floor of the barracks while animals were stabled on the lower floor. However, more evidence is needed to test this hypothesis. It is clear that the major period of occupation at Bshir occurred in the fourth century and that the fort was abandoned in the fifth century for as yet undetermined reasons.

The Survey of the *Limes* Zone

As indicated above, the survey team is covering both the fortified frontier zone itself as well as the desert fringe immediately east of the *limes*. A sector of this latter area was covered in 1980: some fifty sites were located in the desert east of al-Qatrana.¹⁶ This season the survey covered the sector of the *limes* between the upper Wadi Mujib and the modern Deset Highway. One hundred and thirty sites were visited in this region; most are new additions to the emerging archaeological map of Jordan. The results of the surveys of 1980 and 1982, combined with the recently completed Central Moab survey (under the direction of J. Maxwell Miller) of the region to the west, has resulted in coverage of a complete section of the

¹⁴ Parker, *ADAJ*, 25 (1981) p. 177; Parker, *BASOR*, 247 (1982), p. 11-18.

¹⁵ Parker, *ADAJ*, 21 (1976) p. 24.

¹⁶ Parker, *ADAJ*, 25 (1981) p. 177-178; Parker, *BASOR*, 247 (1982) p. 18-19.

Moabite plateau from the edge of the Dead Sea escarpment to the fringe of the desert. Farther south, the region south of the Wadi Ḥēsā has recently been surveyed by Burton MacDonald. All three projects have begun to share their results to present an overview of the archaeological resources of an extensive region: central Moab and northern Edom, which together comprise a major portion of Rome's Arabian frontier.

The preliminary tabulation of the artefacts recovered from the 130 sites visited by the Central *Limes Arabicus* Project in 1982 suggested that the best represented periods were Paleolithic (to 35,000 B.C., 38 sites); Chalcolithic/Early Bronze (4500-2200 B.C., 44 sites, plus 9 possible sites); Iron Age (1200-539 B.C., 39 sites, plus 10 possible sites); Early Roman (79 sites) and Late Roman/Early Byzantine (50 sites). About half the early Roman (Nabataean) and Late Roman/Early Byzantine sites appear to have been watchtowers. The region was apparently sparsely occupied in the Epipaleolithic period (35,000-8,500 B.C.), the Neolithic period (8500-4500 B.C.), in the Middle and Late Bronze periods (*ca.* 2200-1200 B.C.), and in the Late Byzantine and Islamic periods (A.D. 500-1918).

The Signaling Experiment

A major goal of the survey was to locate and date the watchtowers of the region in order to conduct an experiment involving the Roman signaling system. After permission had been obtained from the Jordanian government, members of the staff were placed in fourteen forts and watchtowers known to be contemporary with the Lejjūn legionary occupation. The purpose of the exercise was to test the feasibility of transmitting intelligence from outlying posts to the major troop concentration at Lejjūn (and vice versa). Signaling by night was attempted by the flames of torches.¹⁷ Each post kept a detailed log of what transmissions it received and sent. A simple code was developed to alert

adjacent posts of the approximate strength of a hypothetical incursion. Khirbet el-Fityān, excavated in 1980, was chosen as the central hub of the network because of its proximity to Lejjūn and its excellent field of observation. One group of ten posts radiated northeast from Fityān to Qasr el 'Al, which overlooks the Wadi Mujib *ca.* 20 kms. northeast of Lejjūn. A second group of three posts radiated southward from Fityān some 15 kms. to Qasr Abū Rukbah. The experiment began at 3 p.m. and ended at 9 p.m.

Attempts to signal during daylight met with mixed results. Reflected light from mirrors could be picked up by the adjacent posts only within *ca.* 5 kms. High winds tended to dissipate the smoke signals originating from four scattered posts: smoke from only two of these was seen by adjacent posts. The signaling at night by torches, however, met with spectacular results. The torches were clearly visible at distances up to 10 kms.; most posts reported successful reception and transmission of messages from several different posts. Although the analysis of the logs from the posts is still in a preliminary stage, it seems clear that much valuable evidence has been obtained.

Historical Conclusions

The second season of the Central *Limes Arabicus* Project has sharpened the picture of the historical development of this sector of the Roman frontier. But a number of significant problems remain. Only a brief historical sketch may be attempted in this report, with the primary focus on the principal historical questions raised in the introduction.

On the basis of the existing evidence, what can account for the dramatic military buildup in this sector about A.D. 300? Surely some reorganization and reconstruction was required following the general chaos of the third century and the Persian and Palmyrene invasions of the eastern provinces. But the shift from an essentially linear defense of the second

¹⁷ Cf. Frontinus, *Strategemata* 2.5.16, who notes that the Arabs signaled the approach of an enemy with smoke by day and with fire by night. Roman use

of fires for signaling is attested on Trajan's column.

and third centuries to a defense in depth *ca.* 300 implies a change in the security situation on the central Arabian frontier. It might be argued that local Roman commanders were simply implementing an Empire-wide order for a change in its strategic posture, and to some degree this may be true.¹⁸ But in the southern sector of the Arabian frontier, from Ras en-Naqb to Aqaba, the linear defense of forts along the *via nova Traiana* apparently remained unchanged. Several regional factors may have combined to alter the security situation on the southeastern frontier.

First, the crisis of the third century probably disrupted commercial traffic between the Empire and the Arabian peninsula; some Arab tribes in consequence may have turned to brigandage and raiding, encouraged by the very weakness of the Empire.¹⁹ Second, groups of tribes may have united politically in anti-Roman coalitions during the third and fourth centuries. One such case may be that of Imru' el-Qais, whose tombstone of A.D. 328 at Nemara in southern Syrian proclaims him "king of all the Arabs." His influence apparently extended from southern Syria, where he was buried, into the Arabian peninsula, where he claims conquests.²⁰ A later and better documented example of this kind of threat is that of Mavia, the Saracen queen during the reign of Valens (364-378), whose tribal confederation launched devastating raids on the southeastern frontier until her conversion to Christianity.²¹ It seems likely that such a threat existed along the central sector of the Arabian frontier in the late third and fourth centuries.

The Roman response took several forms. The large number of milestones of Diocletian attest that the provincial road

system was systematically repaired.²² The old line of forts along the *via nova* remained occupied, but now served as the rear echelon of a broad zone *ca.* 20-30 kms. in depth to the east. *Legio IV Martia* was established in its new fortress at Lejjūn, and other reinforcements were placed in a chain of forts 10-20 kms. apart that guarded major migration routes between the desert and the settled areas. Most of the *castella*, or auxiliary forts, such as Qaşr Bshīr, Qaşr eth-Thuraiya, and Khirbet ez-Zona, appear to be new foundations of the *quadriburgium* type. But most of the watchtowers appear to be reused Nabataean and/or Iron Age structures, such as Rujm Beni Yasser near Lejjūn. A complex system of observation and communication was established that could transmit word of nomadic incursions rapidly. The success of this system of frontier defense is reflected in the relative abundance of sites occupied in the Early Byzantine period (fourth and fifth centuries), not only within the frontier zone itself, but even on the desert fringe east of the frontier.

During the later fourth and fifth centuries the frontier garrisons (*limitanei*) may have evolved into a hereditary peasant militia. But it must be stressed that this supposed transformation, resting on evidence from the Roman law codes and such sites as Nessana in the Negev, has not yet been demonstrated by the cultural material from Lejjūn or the other excavated sites of the central Arabian *limes*. The discovery of several watermills in the Wadi Lejjūn, which may be connected with the legionary occupation, implies considerable local grain production.

Further, what can account for the apparent abandonment of most forts by

¹⁸ Edward N. Luttwak, *The Grand Strategy of the Roman Empire from the First Century A.D. to the Third*, Baltimore: John Hopkins, 1976 p. 130-190, for the implementation of this strategy throughout the Empire.

¹⁹ Werner Caskel, The Bedouinization of Arabia, p. 36-46 in G.E. von Grunebaum, ed., *Studies in Islamic Cultural History*, Memoirs of the American Anthropological Association, 76, Wisconsin, 1954.

²⁰ G.W. Bowersock, The Greek-Nabatean Bilingual Inscription at Ruwwafa, Saudi Arabia, p. 513-522

in *Hommages à Claire Préaux*, Brussels: University of Brussels, 1975. See p. 520-522 for a discussion of the Imru' l-Qais inscription, with full references.

²¹ Rufinus, *HE*, 2.6; cf. Bowersock, *HSCP*, 80 (1976) p. 225-226.

²² P. Thomsen, Die Romischen Meilensteine der Provinzen Syria, Arabia, und Palaestina, *ZDPV*, 40 (1917) p. 1-103; 92-93, which lists 26 milestones of Diocletian and 11 of the Tetrarchy dated 306-317. Others have appeared subsequently.

the early sixth century? The results of the 1976 survey, which suggested a widespread abandonment in this period, have now been confirmed by excavation at Lejjun, Fityān, Yasser, and Bshir. With the possible exception of Bshir (where the excavated area is too small to draw secure conclusions) all these forts were abandoned peaceably: Fityān, Yasser, and Bshir before 500, Lejjūn after the earthquake of 551. The final phase of occupation of the fortress (Stratum III, Late Byzantine) suggests much about the frontier in the early sixth century. The earthquake of 500 caused considerable damage to the barracks, yet no attempt was made to rebuild the inner rooms of the *milites* (B.3. and B.4). Stratum III occupation was mostly confined to the outer courtyards. Some reconstruction may have occurred in the *principia*, but the beaten earth floors, secondary thresholds, and other shoddy architectural alterations suggest the garrison lacked the means for a proper restoration. As has been argued elsewhere, the legion may have been mobilized along with other eastern *limitanei* by Justinian *ca.* 532.²³ If so, the last two decades of occupation may reflect the activity of discharged soldiers and their families, who may have moved into the more substantial buildings (such as the *principia*) or open areas (such as the barracks' courtyards). On the other hand, if the legion was transferred from Lejjūn for service elsewhere, the final occupation may reflect the presence of civilians from the *vicus* or surrounding region. The *mansio* in the western *vicus*, for example, showed no trace of Late Byzantine occupation. This final occupation was ended by the earthquake of 551.

It appears that the central Arabian *limes* was abandoned for both military and economic reasons. The Emperor Justinian (527-565) was engaged by continuing wars with the Persians in Mesopotamia, serious pressure on the Danube, the attempted reconquest of the West, and a massive program of public works. The efficiency of the regular *limitanei* was apparently inadequate to control Arab raids. He turned over primary responsibility for the defense of the southeastern frontier to Arab federate forces under phylarchs, especially the Ghassanids.²⁴ Replacing the *limitanei* with federates probably saved financial resources and manpower for service on more threatened frontiers but also sharply reduced local security. This growing level of insecurity along the Arabian frontier is reflected by the low number of the sites occupied in the Late Byzantine (sixth and early seventh centuries) period.

From an imperial perspective, the savings in financial resources and scarce military manpower obtained from the essential abandonment of the Arabian *limes* may have been worth the loss of population and revenues from a fringe area of the Empire. But the long range implications of this shift in policy were devastating. As long as an effective Ghassanid client phylarchy was supported, some measure of security, albeit reduced, was maintained along the frontier. But the successors of Justinian weakened the Ghassanids without any corresponding revitalization of the old *limes*.²⁵ This disastrous policy facilitated the Muslim conquest of the Levant in the early seventh century.

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²³ Procopius, *Anecdota* 24 p. 12-14; cf. Parker *ADAJ*, 25 (1981) p. 173, 178; *BASOR*, 247 (1982) p. 21-22.

²⁴ Procopius, *Bellum Persicum* 1.17.45-48. For a full

discussion of the creation of the Ghassānid phylarchy, cf. Irfan Kavar (Shahid), *Arethas, Son of Jabalah*, *JAOS*, 75 (1955) p. 205-216.

²⁵ Parker, *Towards a History*, p. 874.