

# THE 1994 AND 1995 SEASONS OF EXCAVATION AT ABILA OF THE DECAPOLIS

by

W. Harold Mare

## THE 1994 SEASON

### Introduction

The eighth season of excavation at Abila of the Decapolis-Quwayliba (Fig.1), northern Jordan,<sup>1</sup> was conducted from June 11 to July 30, 1994 with W. Harold Mare, Director, and Covenant Theological Seminary, St. Louis, Missouri, as principal investigators.<sup>2</sup>

Ancient Abila is a large site, extending about 1.5 km north-south and about 0.5 km east-west, consisting of two tells and a saddle depression in between.<sup>3</sup>

### Objectives

The objectives set forth for the 1994 season of excavation at Abila of the Decapolis had three major components: 1) to do pure research into the physical materials available at the site (i.e., ceramic evidence, stratigraphic profile, architectural remains, human skeletal remains, geological, faunal and floral evidence, numismatic specimens, inscriptional evidence, soil analysis, etc.), which would be of help to understand the cultural history of the site); 2) to perform cultural research management in doing salvage archaeology, by retrieving and preserving as much as possible of the physical remains exposed or disturbed by unlawful digging, as, for example, has occurred extensively in the tombs; and 3)

to continue our intensive educational program consisting of byweekly lectures in camp and an extensive educational touring program of Jordan on weekends to aid the staff in understanding better the archaeological cultural history of Jordan and how this integrates with the culture and history of Abila of the Decapolis; part of the educational program also included provision for regular college or graduate school archaeological courses including a practicum in the field for which three to four hours of credit could be earned.

The objectives accomplished in the Abila of the Decapolis excavation in 1994 were as follows:

### 1. Tall Abila (The North Tall), Area A

(John D. Wineland)

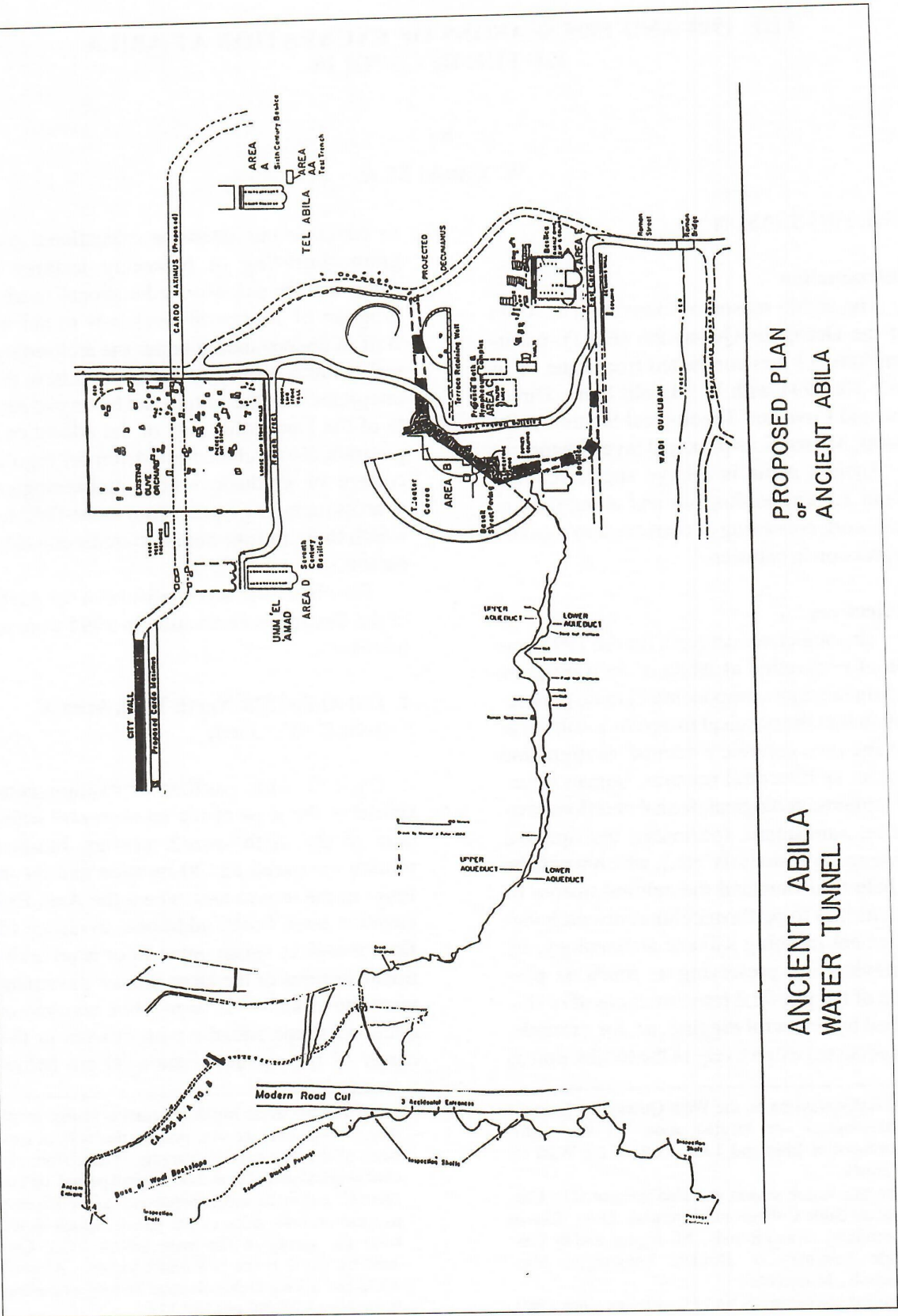
On Tall Abila further excavation continued to the west of the monumental stairway of the sixth-seventh century basilica (which measured ca. 20 m wide and 34 m long) in the atrium area where the Area Excavation team found additional evidence of floor mosaics; on an upper floor level additional sections of the large mosaic pavement were found laid with large white tesserae in diamond shape squares with crosses in the center of the squares; some 30 cm below

1. Abila/Quwayliba on the Wādi Quwayliba is an archaeological site located about 15 km north-northeast of Irbid and 4 km south of the Wādi al-Yarmūk.

2. The excavation season was also sponsored by Cincinnati Bible College and Seminary, Ohio, Calvin Seminary, Grand Rapids, Michigan, and by Cascade Seminary of Biblical Languages, Minneapolis, Minnesota.

3. Our extensive survey and excavations since 1980,

as well as the many building remains visible in all directions all over the site, point to the fact that sections of the city existed, varying in size from archaeological period to archaeological period, on the two tells and in the saddle depression as well as east to west on both sides of the stream which flows from the spring in the main valley, Wādi Quwayliba, north to the al-Yarmūk Valley. Ancient Abila has a long archaeological history extending from about 3500 BC to 1500 AD.



that upper floor the team found another level of mosaic flooring in geometric and spiral cross designs, a floor belonging to an earlier building, presumably an earlier Christian basilica, or possibly to a Greco-Roman temple. The team also excavated outside and south of the acropolis wall (to the south of the church's atrium) and found considerable quantities of Early Bronze sherds, suggesting that Abila's Early Bronze settlement extended over a larger portion of the tall beyond that found to the east in Area AA. A probe was made just to the west of the atrium in an attempt to find remains of the *Cardo Maximus*, but instead, large quantities of Early Bronze sherds were also found, as well as sherds of later periods; the north-south street is presumably to the west of the probe, in an area near a tower-like structure which we partially excavated in 1994. In a series of probes along the north wall of the Area A basilica the team found extended sections of the Byzantine sub-surface water channel which had coursed its way west-southwest from the sections of it in Area AA on the east, extending toward a cistern, presumably under or along the north wall of the church, a water channel which no doubt collected rain water from the roofs of the public buildings on this area of the tall's acropolis and directed it to the church's cistern for use in the church's religious activities. It was here in the debris along the north wall of the Area A basilica that the team found a large, life-size, well-sculptured, white marble statue of the Greek huntress goddess Artemis (Roman goddess Diana). Aside from the head and arms and one leg which were missing, the majority of the statue, measuring 1.64 m in length, was preserved, including the torso with its well-sculptured folds, belt and quiver on the back, and one leg, with well-sculptured foot and sandal and post, and the hind quarters of a small deer; on the base were small marble projections indicating the place where the second leg had been attached (Fig.2).



2. Marble Statue of Artemis, back view, with Quiver.

**Tall Abila (The North Tall), Area AA**  
(Glenn A. Carnagey and Susan Ellis-Lopez)

In Area AA, located just to the north-east of the central and north apses of the Area A basilica the excavation team further deepened the 12 m probe of Area AA 1 where Middle and Early Bronze Age phases were exposed, producing loci of Early Bronze I, II, and III. In Square AA 5, just to the east of AA 1, excavation at a higher level than in AA 1 produced a mixture of pottery of different periods, but as excavation here continued increased quantities of Early, Middle and Late Bronze Age sherds kept coming to light. In the squares to the east of AA 1 and 5 and AA 7 the team found additional artifactual evidence pointing to phases of Byzantine habitation and living surfaces, and uncovered additional sections of the sub-surface Byzantine water channel (plastered), including the east end of the channel at the east crest of the acropolis; it was into this hydraulically plastered channel that presumably water spouts (*simae*) spaced along the roof edge of

the large public buildings emptied their rain water.

**The Saddle Depression. The Theater Cavea, Area B** (Bastiaan Van Elderen)

In the saddle depression between the two tall, at the theater cavea (Area B), the 1994 excavation team uncovered increased sections of the extended Byzantine basalt street, both in its north extension toward the east-west Decumanus, and also to the east and north, demonstrating that this street ran in a semi-circle from the Decumanus: south from the east edge of the Area E cruciform basilica, then west between the theater cavea and the bath/nymphaeum, and then north to join the Decumanus again; this agrees with our projection about the street in our previously published plan of Ancient Abila. Also next to the section of the Byzantine basalt street, near where it extends over the earlier Roman limestone street/plaza, the team uncovered a large section of mosaic of white tesserae laid up against two walls constructed at about a 75 degree angle to each other. The team also made an extensive probe back into the middle level of the theater cavea up against a large perpendicular wall there, uncovering a large statue niche (ca. 3 m high; the Greek letters ΔΙ (part of the spelling of Zeus in oblique cases), were painted on the back upper curve of the niche, suggesting that a statue of Zeus was placed here), and a large quantity of fragments of glass goblets and numbers of lumps of glass slag, all pointing to the existence of an ancient glass installation in the immediate area in the Roman-Byzantine periods.

**Saddle Depression. The Bath/Nymphaeum Complex, Area C** (John R. Lee and Steven McDougal)

At the massive pile of ruins, the proposed bath/nymphaeum complex, just to the north of the theater cavea, the Area C team probed

farther into Area C 2, exposing more of the erect column there which seems to be resting on a floor surface, but the team was not able during this season's work to reach that floor surface. On the east side of the ruins the team exposed a number of later secondary walls just in front of the domed arch there, which punctuates the middle of this east façade. They also exposed two of the water sluices which emptied the Umm al-'Amad Aqueduct's volume of water from 'Ayn Quwayliba into a large vaulted settling basin/tank on the north side of the structure. Also through a square excavated just above one of the sluices they were able to clear out some of the debris in it. Just west of this vaulted basin/tank and sluices the team also cleared away the debris of another settling basin/tank, which contained two reused basalt sarcophagi placed on either side of the basin and used as smaller distribution containers; they also found there the remains of an additional sluice. To the immediate south of this second distribution basin/tank, but on a lower level, the team found an additional vaulted settling tank extending far back into the structure. Calculation derived from the electronic total station and the use of other measurements indicate that the bath/nymphaeum complex measured approximately 25 m on each of its sides.

**The Saddle Depression. The Byzantine Basilica, Area E.** (Clarence Menninga)

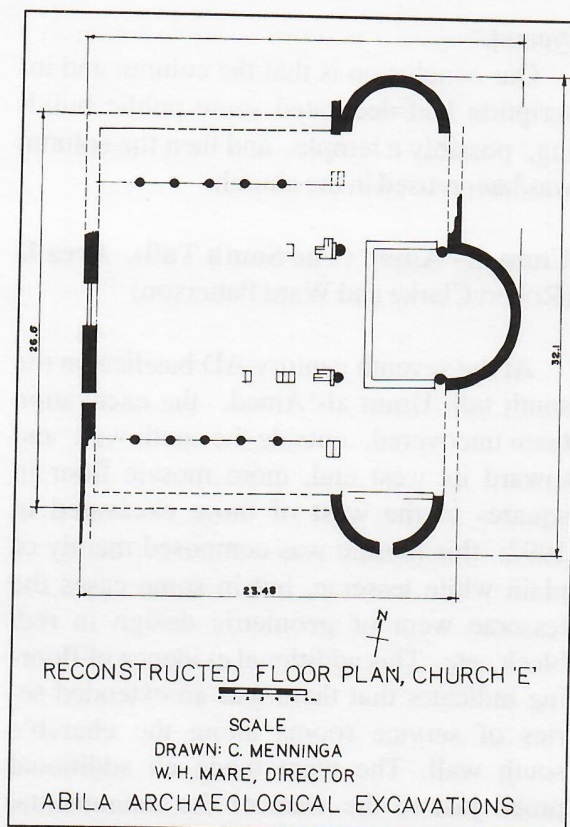
In the Area E basilica, located just to the north-east of the bath/nymphaeum complex, on the lowest terrace and just to the west of the Roman bridge (Fig.3), the excavation team probed the north and south sectors of the structure near the point where the church's central iconostasis begins. The objective was to see if the church was cruciform in design. Here on the south they excavated the exposed remains of part of a semicircular wall and found the lower courses of a south side apse, together with the foundations of an iconostasis screen and posts and two small sections of



3. Area E Basilica.

mosaic flooring; a small opening in the center of this apse on the south may point to the reuse of this section of the basilica as a mosque. Additional probing on the north side of the basilica produced lower courses of a similar north side apse, together with a mosaic floor within this apse. The archaeological evidence shows that the Area E basilica was cruciform in plan. Probing within the central altar area did not uncover any mosaic fragments, nor any burials. Further in the west section of the basilica, excavating along the south side of the nave and in the outer south aisle, did not produce any evidence of the stylobates for this five-aisle church, nor any flooring, leading to the conclusion that these materials had been removed from the basilica in ancient times. Following the removal of a 4 to 5 m overlay of debris covering the western sector of the basilica, debris which had filtered down the saddle over the centuries, including massive amounts of sheep dung from modern shepherding activity,<sup>4</sup> a portion of the western wall of the church was uncovered, together with a central entrance with the threshold stone, and a south aisle entrance (Fig.4).

Contrary to our original projection of a rectangular structure here,<sup>5</sup> this Byzantine basilica, cruciform in plan, is almost square, being ca. 32 m in width (including the side apses), and ca. 26 m in length. An exciting find in the debris came to light: the team



4. Area E Basilica, Top Plan.

found the Abila Excavation's first full inscription inscribed on the bottom section of a long granite column which had been reused in the church; the inscription (studied and published by Bastiaan Van Elderen, the Staff Epigrapher) began with the familiar second century AD formula (found in inscriptions at Jarash), "Agathe Tyche"; the shape of the letters also indicates that the inscription was composed in the late second century AD.

The inscription reads. ἀγαθῇ τύχῃ υπὲρ σωτηρίας τῶν κυρίων Δισχασδαινίωτος φιλοτειμησάμενος ἐκ τῶν ἰδίων τὸν στῦλον ἀνήγειρεν ἕξ(ησεν) κς. Van Elderen's translation reads, "To good Tyche: For the safety of the rulers, ..... Dischasdeinionus, having achieved his ambition, from his own expenses erected this column. He lived 26

4. Earlier excavation of this material showed a thorough mixture of pottery material from all the archaeological periods.

5. We had estimated it to be about 25 m wide and 40 to 60 m in length - similar proportions to the Area A and Area D basilicas.

[years]."

Our conclusion is that the column and inscription had decorated some public building, possibly a temple, and then the column was later reused in the church.

**Umm al-‘Amad (The South Tall), Area D**  
(Robert Clarke and Ward Patterson)

At the seventh century AD basilica on the south tall, Umm al-‘Amad, the excavation team uncovered, outside the south wall and toward its west end, more mosaic floor in squares to the west of those excavated in 1992; this mosaic was composed mainly of plain white tesserae, but in some cases the tesserae were of geometric design in red, black, etc. This additional evidence of flooring indicates that there was an extended series of service rooms along the church's south wall. The team made an additional probe just to the west of the monumental porch columns but by the dig's end they had not reached the mosaic flooring which had shown up in an earlier season. The team placed major emphasis in excavating the surface ruins (walls, column drums, etc.) in a sector across the modern path just to the north-west of the basilica to see what relationship there might be between these ruins and the basilica. Here in several squares the team found a basalt threshold leading into some building to the north, together with a pavement under which ran a sub-surface drain which in its turn seems to have run towards the cistern located just north of the Area D basilica whose water served the needs of the church. Also in this north-west sector mosaics on two floor levels were found, the upper floor level showing circular patterns and crosses and other designs.

**Umm al-‘Amad (The South Tall), Area DD** (David Vila)

Area D is a new area on a lower level and across the modern road several meters

to the west of the porch of the Area D basilica; this area was separated in 1994 from Area D because of the discovery there in 1992 of the apse of an earlier basilica (Fig. 5). This apse contained an inscribed mosaic floor in geometric design. Here in 1994 the excavation team, in probing to the north of the apse found in 1992, uncovered two additional apses, thus showing that this earlier basilica was triapsidal; in two of the apses inscribed mosaic floors were found. In probing to the south of the south apse the south wall of the basilica was uncovered, and excavation to the west of the apses revealed in the area of the south aisle patches of mosaic floor, of circular pattern, and a cache of glass lamp fragments, together with one complete glass lamp with projecting glass stem. Conclusion: the basilica had an elaborate system of ceiling-hung circular chandeliers/candela (into which glass lamps were inserted) for extensive illumination of the church. Also found here with the glass cache were parts of a brass jug with a metal handle cast in the form of a leopard, a vessel probably used to fill the chandelier glass lamps with oil. Just west of the central apse the team found remains of the foundation blocks (of the iconostasis) for the basilica's altar area inside of which was opus sectile paving, including a block carefully incised with a circle and a carefully inscribed Christian cross within the circle. Some 12 m to the west of the north apse the team found the church's deep cistern (ca. 3 to 4 m deep), which produced large quantities of sherds from Late Roman through



5. Area DD Basilica, foreground; Area D Basilica, background.

the Ayyubid and Mamluk periods. With this mixture of pottery we conclude that this Byzantine church's cistern had been used by later inhabitants as a refuse for all kinds of pottery and pottery sherds which they found in this area. Nearby within the confines of the basilica numbers of secondary walls had been constructed.

During all of the 1994 excavation season the team found no evidence of stylobate material, column drums, bases or capitals, leading to the conclusion that when the nearby later seventh century AD basilica was being constructed, the builders ransacked the earlier Area DD Byzantine basilica, conveniently taking for reuse its basic building materials. However, that the church has three apses preserved shows that the structure had at least two stylobates and two rows of columns, presumably similar in plan to the Area D basilica.

#### **Tomb Excavations. Areas H** (Robert W. Smith)

In 1994 the tomb excavation team searched diligently along the east wadi slope of Wādī Quwayliba to the north-east of Tall Abila for further evidence of undisturbed Roman-Byzantine tombs. (Up through 1992 seventy-four tombs and graves had already been excavated.) Due to extensive unlawful modern looting, such tombs were hard to find, although one or two small graves were found and excavated, and one small undisturbed tomb complex was excavated. In addition, one or two tombs were salvaged. The tomb team spent considerable time this season finishing excavating and drawing the Area H 36 pottery kiln (found in 1992) located along the upper slope of Area H, where the potters could take advantage of an updraft from the strong westerly winds. The team was unsuccessful in finding the major earlier Iron and Bronze Age cemeteries. Through 1994 the Abila tomb excavation teams have excavated 84

graves, tombs, and tomb complexes.

#### **The Educational Program** (Reuben G. Bullard and Mark Damron)

The comprehensive Educational Program included lectures, featuring senior staff members, scheduled twice weekly centering on different disciplines, such as geology, epigraphy, the history of Abila and the Decapolis, ancient coinage, tomb excavation, expertise in the recording system, etc. In special lectures, Fawzi Zayadine, of the Department of Antiquities, gave a presentation on the History and Archaeology of Irāq al-Amīr, and Pierre Bikai, Director of the American Center of Oriental Research, 'Ammān, spoke on the Archaeology of Petra, emphasizing the New Scrolls discovered in a recently found Byzantine church there. Weekend educational trips for the staff included Jarash, 'Ammān, Pella and the Jordan Valley, Gadara, the Desert Castles, and an extensive trip to Petra, 'Aqaba, Wādī Rumm, etc., as well as visits to other sites.

#### **Acknowledgements for the 1994 Excavation Season**

The excavation was undertaken with the support of the Director-General of the Department of Antiquities of the Hashemite Kingdom of Jordan, and assisted by Sultan Shureidah, the Irbid Inspector of the Department of Antiquities and Wajeeh Karasneh, the Umm Qays Inspector of the Department of Antiquities. The Staff consisted of 50 persons (46 from the United States, 2 from Canada, 1 from South Africa and 1 from the Fiji Islands), and 50 to 55 local workmen. The Department of Antiquities and the Ministry of Education of Jordan had arranged for the Abila Excavation Staff to use the facilities both of the Khurayba Boys School (Mr Jameel Naamneh, Principal) and the nearby Selah Girls School (Mrs Anneh Ababneh, Principal). The American Staff of

fifty members<sup>6</sup> was very valuably aided by the Department representative, Sultan Shureidah, augmented by the local staff cook and his assistant and by the 50 to 55 local workmen hired for the various labor tasks in the field and in camp.

The Khurayba Boys School and the Selah Girls School, being near Abila provided easy access to the site as the American Staff was transported to the site each working day.

The Abila Excavation wishes to express its sincere appreciation to the Director-General of the Department of Antiquities, Dr Ghazi Bisheh, to Sultan Shureidah and Wajeeh Karasneh, Department Representatives, to all members of the Department of Antiquities and to all of the Abila Staff for their outstanding support and assistance, as they helped to make the 1994/1995 seasons of ex-

cavation at Abila of the Decapolis an outstanding success. We also extend our thanks to Dr Wesley Ulrich, M.D., and Aileen Coleman, R.N., for their many kindnesses in storing all of the Abila Excavation equipment at the Annoor Hospital in al-Mafraq, Jordan.

## THE 1995 SEASON

### Introduction

Our 1995 Abila of the Decapolis Special Underground Aqueduct Excavation from July 3 until August 5, was staffed with 10 members,<sup>7</sup> together with Nassar Khursawneh, Department Representative, and with the valuable encouragement and cooperation of Dr Ghazi Bisheh, Director-General of the Department of Antiquities of the Hashemite Kingdom of Jordan, and with the important

6. Of the American Staff of 50 persons, the Senior Staff consisted of W.H. Mare, Director, Ward Patterson, Cincinnati Bible Seminary, Bastiaan Van Elderen, Calvin Seminary; John R. Lee, St. John Fisher College, Rochester, New York, Robert H. Kyle, Covenant Seminary; Glenn A. Carnagey, Cascade Seminary of Biblical Languages, Minneapolis, Minnesota; Robert W. Smith, Miami University, Ohio; John D. Wineland, Miami University, Ohio; Clarence Menninga, Calvin College, Michigan; Robert T. Clarke, III, Sweetwater, Tennessee; David H. Vila, St. Louis University; Susan Ellis Lopez, Heritage College, Mabton, Washington; Steven R. McDougal, St. John Fisher College; Timothy Snow, Cincinnati Bible Seminary, Hendrick Reitsema, Covenant Seminary, Camp Manager, and Joni VanDerPol, Covenant Seminary, Registrar. The General Staff members' positions were as follows: Area Supervisors and Assistants: John D. Wineland, Area A; Area AA, Glenn A. Carnagey, Susan Ellis Lopez; Bastiaan Van Elderen, Area B; John R. Lee, Area C; Steven McDougal, Area C; Robert T. Clarke, Area D Supervisor, Ward Patterson, Assistant Area D; David Vila, Area DD; Clarence Menninga, Area E Supervisor; and Robert W. Smith, Tomb Areas Square Supervisor included: Anne Albers, Robert Berry, Matteson Bowles, Ada Braun, Jared Bryson, Jody Cullen, Mark Damron, Ailen Dean, Derek Fishel, James Gray, Dr. Janet Gray, Christine Hitchcock, Josef Kahabka, Sudarsan Kant, John Kirchner, Bethany Madsen, Saralyn Madsen, Kevin Morrow, Dara Nykamp, Hendrick Reitsema, Riana Reitsema, Mark Sher-

man, David, Stegen, Sara Swinson, Marvin Taylor, Douglas VanDerPol, Mark Verbruggen, Susan Vila, Harrietann Weller, Leo Werner, Rachel Wheelles, and Connie Wineland. The Specialists were: Ceramicists, W. Harold Mare, Bastiaan Van Elderen and Glenn Carnagey; Architect, Harold Stigers, Robert Kyle and Jared Bryson, Assistants; Epigrapher, Bastiaan VanElderen; Osteologist, Robert H. Kyle, M.D.; Geoarchaeologist, Clarence Menninga; Zoologist, Jared Bryson; Photographer, Timothy Snow and James Gray, Assistant Registrar, Joni VanDerPol, Ada Braun and Roger Noble, Assistants; Daniel Dyke, Computer Imaging Director; Glenn Carnagey, Director of Computer Processing, Matteson Bowles, Derek Fishel and Jody Cullen, Assistants; Draftsmen-Artists, Robert Smith, John Kirchner and other members of the Staff; Educational Director, Dr Reuben G. Bullard and Mark Damron, Assistant. The Support Staff consisted of: the Department of Antiquities Representatives, Sultan Shureidah and Wajee Karasneh; the Camp Manager, Hendrick Reitsema; the Medical Advisor, Robert H. Kyle, M.D., and the Cooks and their assistant.

7. The Staff members of the 1995 excavation were as follows: W. Harold Mare, Director, James Gray, Area Supervisor; Robert Berry, Area Supervisor; David Vila, Area Supervisor; Janet Gray, Assistant Area Supervisor; Robb Ludwick, George Van Voorhis, Mary Van Voorhis and Jessica Robertson, Square Supervisors; and Elizabeth Mare, Business and Administrative Assistant. Several local Jordanians were hired to assist in the work.

assistance of Sultan Shureidah, Inspector of the Irbid Office of the Department of Antiquities.

The objectives of the 1995 excavation season were as follows: to trace in detail, map and find by excavation and survey the interlocking connections of the various underground aqueducts at Abila, and to show how they served to bring water into the civic center of Abila to meet its religious, cultural, commercial and industrial needs, as well as to supply the needs of citizens living in the outlying residential districts.

To meet these objectives, the following areas of excavation and investigation were planned:

1. *Area Aqueduct 1*, Work just to east of the Area C bath/nymphaeum complex in the underground vaults and settling tanks/basins.<sup>8</sup>
  2. *Area Aqueduct 2*, Work in the underground aqueduct segments along the east ledges of the south tall, Umm al-'Amad.<sup>9</sup>
  3. *Area Aqueduct 3 A*, Proceed with a Test Trench Project near the main spring, 'Ayn Quwayliba, and two probes to the east of the Area C bath/nymphaeum complex to trace the sluices which open into one of the Area C, Aqueduct 1 settling tanks/basins.<sup>10</sup>
  4. *Area Aqueduct 3 B*, Develop the Test Trench Project in the area of the Khurayba Aqueduct exit in the hill just south of 'Ayn Quwayliba, to see possible connections between the Khurayba underground aqueduct and the Umm al-'Amad underground aqueducts.<sup>11</sup>
  5. *Area Aqueduct 4*, Investigate the newly discovered underground aqueduct opening found in the small wādī just to the west of Tall Abila and Umm al-'Amad.<sup>12</sup>
- Progress and objectives obtained were as

follows:

1. *Area Aqueduct 1*. In this area near the bath/nymphaeum complex, the team opened up the east-west underground vault, located just to the east side and at the north edge of the bath/nymphaeum; this vault was about 4 m below the upper structure of the main part of the bath/nymphaeum ruins. Then the team excavated the first segment of the underground north-south vault, also just to the east of the major bath/nymphaeum ruins. At the south end of this north-south vault segment large cut limestone blocks were resting within the soil in such a precarious position that the team was forced to open up a 4 x 6 m square at the soil surface above and just to the south of the underground north-south vault to expose properly the material below; in this 4 x 6 m square a north-south wall was exposed, the lower courses of which were of Roman construction.
2. *Area Aqueduct 2*. In this segment of the underground aqueducts which coursed their way south-north under the east ledges of Umm al-'Amad the excavators probed and dug out sections of the aqueducts where soil chokes had blocked their way, and then mapped these various interlocking and interconnecting aqueducts which brought water from 'Ayn Quwayliba on the south to the area of the bath/nymphaeum complex, located in the civic center in the center of Abila. The investigators determined that there were two, and possibly three, Umm al-'Amad underground aqueducts, with many cross channels linking the system together, in the segments of which the masons cut openings from the surface down to the

8. James Gray, Robb Ludwick and George Van Voorhis.

9. Robert Berry, Robb Ludwick and George Van Voorhis.

10. David Vila, Janet Gray, Mary Van Voorhis and

Jessica Robertson.

11. George Van Voorhis.

12. W. Harold Mare, Robert Berry and Robb Ludwick.

tunnel channel level (openings in Latin called, *putei*, or *lumina*) every 30 to 40 m, spaced in this manner for access, fresh air, cleaning, and to make the digging procedure less complicated. The masons who dug the aqueducts also cut small lamp niches into the sides of the walls of the aqueducts into which they placed small ceramic lamps to provide light when they were chiseling out the aqueducts; these niches no doubt were also used for the lamps of those who later repaired or cleaned out the aqueducts. At several points stone platforms were placed part way down in the openings, with holes cut into the platforms to allow persons standing on the platforms to lower their buckets through the holes to obtain water for their personal use. In the excavating and mapping process, with the use of a Brunton compass, the team was able to determine that these Umm al-‘Amad underground aqueducts extended north as far as the small hill just east of the theater cavea, to a point just south of the bath/nymphaeum complex. To the south the aqueducts extended to the vicinity of ‘Ayn Quwayliba, and in one case, the team, through its underground mapping, established that one of the underground aqueducts actually extended west, and slightly north, some 30 m beyond ‘Ayn Quwayliba, giving further support to the hypothesis that the Umm al-‘Amad aqueduct system connected somehow with the Khurayba Underground Aqueduct which exits on the lower slope of the hill to the south of Umm al-‘Amad; the Khurayba Aqueduct’s exit on this south slope of Wādi Quwayliba was about 400 m to the south-west of ‘Ayn Quwayliba. At the north end of the Umm al-‘Amad Aqueduct system near the bath/nymphaeum complex the excavation team found, deep underground, a well constructed Roman arch/vault with settling tank/basin.

3. *Area Aqueduct 3 A.* The excavation team here laid out and excavated three test trenches along surface water courses near ‘Ayn Quwayliba (water courses which headed in the south-west direction toward the Khurayba aqueduct exit) to try to find surface openings into any interconnecting underground aqueduct, linking the Khurayba system on the south with the Umm al-‘Amad system on the north. These test trenches did not uncover any surface openings (*putei*) into an interconnecting underground aqueduct.

This excavation team then moved to the Area Aqueduct 1 sector, to open up two 4 x 4 m squares, east of the bath/nymphaeum and a few meters south of two collapsed sluice openings which brought water north into the east-west underground vault just east of, and on the north edge of, the bath/nymphaeum complex. The team opened up these two squares in an attempt to find out more of the nature of these sluices cut in the rock below the soil layer, to find out the specific direction they extended south, and in the process to understand better how the sluices connected with the Umm al-‘Amad Underground Aqueduct system running north from ‘Ayn Quwayliba. In the process of excavating these two squares the team uncovered a fine flagstone floor belonging to some, as yet unidentified, building, and an apse (extending east), which may be part of ruins of another Abila church; if this latter hypothesis proves to be correct we would now have a total of six churches thus far found at Abila of the Decapolis.

4. *Area Aqueduct 3 B.* In the area in and around the Khurayba aqueduct exit at the south slope of Wādi Quwayliba, the excavation team laid out several test trenches in an attempt to find more evidence of the connection between the Khurayba underground aqueduct, south, and the Umm al-‘Amad underground aqueducts, north.

At the outer north edge of the Khurayba aqueduct exit the investigators excavated and traced a plastered platform extending north, with two descending steps, leading down about 2 m to a place where the water then flowed into an underground receptacle leading north-east toward one of the Umm al-‘Amad aqueducts.

5. *Area Aqueduct 4.* The team of excavators here investigated the newly-found, well-cut *putei* type surface opening leading deep down into some type of channel. This opening is located on a higher level than the *putei* openings leading into the Umm al-‘Amad underground aqueducts. This installation, located in a shallow wadi just west of Tall Abila and Umm al-‘Amad, consisted of an opening which gave access to a shaft descending on about a 60 degree slope. By carefully repelling down the shaft, the team determined that the shaft was 24 m deep, ending up on a floor of accumulated rock and debris which had fallen in during the centuries. This accumulation of debris prevented the team at the time of their investigation from

making a further descent into what we think might be an additional north-south underground aqueduct system, running from north to south toward ‘Ayn Quwayliba to link up with an interconnecting underground aqueduct in the south Wādī Quwayliba and also with the Umm al-‘Amad system near ‘Ayn Quwayliba.

### **Conclusions on the 1995 Special Aqueduct Project**

From our 1995 Abila of the Decapolis underground aqueduct and settling tank investigation and excavation, we have determined that the Abila water collection system was well planned, intricate and more extensive than we had originally thought.

We propose that this system was essentially constructed on the Roman model described by Sextus Julius Frontinus, the first century AD Water Commissioner at Rome.<sup>13</sup>

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