

ACOR Newsletter

أخبار أكور



Vol. 4.1 — Summer 1992

The Petra Project *Kenneth W. Russell*

The ruins of ancient Petra are located within the spectacular eastern rim of the Jordan-Dead Sea Transform ("Dead Sea Rift") in southwestern Jordan, approximately half-way between the southern end of the Dead Sea and the head of the Gulf of Aqaba. Human occupation in the region extends back to at least the Middle Paleolithic (c. 100,000 years ago). Petra is best known, however, as the capital of the Nabataean kingdom, an Arab state economically based upon the long-distance trade in incense, spices and other exotic goods from south Arabia, India and the Far East. After the annexation of the Nabataean kingdom by the Roman emperor Trajan in A.D. 106, Petra remained the most prominent urban and political center of southern Jordan through the sixth century, after which the city disappeared from written records. Rediscovered for the western world by the Swiss explorer Johann Ludwig Burckhardt in 1812, Petra's famous Siq and magnificent tomb facades have inspired authors and poets ever since.

Understandably, the high visibility of Petra's tomb facades and the spectacular scenery of the Siq have overwhelmed the ruins of the ancient city itself, which lies mostly buried beneath centuries of wind-blown sand. The main paved street of Nabataean-Roman-Byzantine Petra has been cleared of the sands which hid it for nearly a thousand years, but the rest of the city, with few exceptions, remains buried. It was among the buried ruins of the city that I discovered a large Byzantine church on the 9th of April, 1990.

Actually, I had initially noticed the ruins of this church in 1973 during my participation in the sub-surface survey of the site conducted by the American Expedition to Petra from the University of Utah. I had returned to the site several times during subsequent years, but never



Surface remains of the Petra structure

found myself with sufficient time to do a formal recording of it. However, during the 1989-90 academic year, I received a National Endowment for the Humanities post-doctoral research fellowship at the American Center for Oriental Research (ACOR) in Amman. During my tenure, I at last had the time to do a more complete study of the site.

While examining the ruins to establish their extent prior to drawing a plan of them, I noticed the presence of numerous large and small tesserae (ca. 1-1.5 cm² surfaces) of fine-grained yellow sandstone, beige limestone, pinkish-gray chert and white marble in what is the southern apse of the structure. Upon closer examination of the current surface in this apse, multiple colored glass tesserae (ca. 0.4-0.75 cm² surfaces) were also observed (dark blue, olive green, light green, amber). Beneath a tilted ashlar block which seems to have fallen from the south wall of the apse, the cross-section of a mosaic was found protruding from the soil. This presumably has weathered intact off the interior face of the fallen ashlar, and now lies within a matrix of soil fill in the apse.

Although small glass tesserae were subsequently noted scattered across the entire eastern end of the church, a particularly dense scatter was found just to the west of the central apse. Here, numerous small (ca. 0.3-0.75 cm² surfaces) glass and stone tesserae in multiple colors occur, including multiple hues of blues and greens, black, yellow and amber.

From the visible remains, it would seem that this church was minimally 30 meters in length and 18 meters in width. Based upon field observations, the following preliminary interpretations are offered: Both the size and associated materials suggest a church of major significance in the region, and it is suspected that it may be the cathedral of the episcopal see of Third Palestine. In the fourth century A.D., the former Roman provinces of Palestine and Arabia were reorganized, with southern Jordan, the Negev Desert and the Sinai Peninsula placed together to form the Province of Third Palestine (*Palaestina tertia*). Petra was the capital of this province, and as such, was the seat of the bishopric.

The glass tesserae appear to have come from ceiling and wall mosaics of exceptionally fine quality. From the depositional context and site topography, it is strongly suspected that at least 2-3 meters of deposition overlie the floor of the church, which presumably possesses further mosaics. Given the established seismicity of the region, it is likely that the structure collapsed during one or more ancient earthquakes, and it is possible that sections of ceiling mosaics may lie semi-intact within the collapse debris.



Dr. Kenneth Russell

S. Kerner

Currently, the only intact examples of similarly early wall and ceiling mosaics in the entire Near East are those in the monastery of St. Catherine's at Mount Sinai. However, the archaeological remains associated with the church at Petra and an examination of the ecclesiastical and economic history of Petra, as recorded in ancient historic texts, indicate that these particular mosaics may date to the fifth, and quite possibly to the fourth century A.D. If this latter date is correct (and only the full excavation of the site can determine this), the church mosaics would be the earliest of their kind, not only in Jordan, but worldwide. Regardless of whether they date to the fifth or the fourth century A.D., they certainly constitute a priceless cultural resource in Jordan, the significance of which qualifies them as a world treasure equivalent to either the Siq or Petra's tomb facades. Unfortunately, one reason that they were discovered in the first place is that they are partially exposed, a situation which threatens their preservation due to both the elements and vandalism.

In order to determine the extent of preserved mosaics, to date them accurately, and to make them accessible to the public, further research is required. The development of the site therefore involves: archaeological excavation, conservation of any recovered mosaics, stabilization of the ancient structure, and construction of a protective shelter over the site. Funding for this project has now been obtained from the United States Agency for International Development (USAID) at the request of the Ministry of Planning and on behalf of the Ministry of Tourism and Antiquities. The grant, which will support all the necessary components of the project, was signed on October 29, 1991.

[The above was written on November 30, 1991. Dr. Russell planned for the project until the day before his death. His staff began work at the site at the end of May 1992.—Editor]

Kenneth Wayne Russell

in memoriam

Dr. Kenneth W. Russell died unexpectedly on May 10, 1992, after a short illness. His tragic death at the age of 41, in the prime of his scholarly career, leaves his friends and colleagues with a deep sense of loss.

Ken was born in Lakeport, California, in 1950. He received his Ph.D. in 1986 in anthropology from the University of Utah and taught courses in anthropology both there and at Weber State University in Utah. He was also involved with cultural resource management in the United States for many years. Beginning in 1990, Ken worked as an archaeologist for the ACOR projects at the Amman Temple of Hercules and at Aqaba (Islamic Ayla). Ken was especially skilled as an anthropologist, and he made contributions to archaeological and ethnoarchaeological theory.

Ken's first love in Jordan, however, was the history and archaeology of Petra. In the mid-1970's he received his early training in archaeological excavation at Petra. In recent years, Ken studied the ethnoarchaeology of the *Bidul* Bedouin, Petra's modern-day inhabitants. He leaves unfinished several manuscripts about his archaeological and ethnoarchaeological work at Petra, which his colleagues will bring to completion. At the time of his death, Ken was about to begin directing the excavation of the church at Petra which he discovered [see the previous article].

We at ACOR remember Ken best for the energy and enthusiasm that showed in his work and personal relationships. Ken was a brilliant and animated lecturer. He was seldom alone in his study carrel in the ACOR library; all who spoke with him, beginning students and established scholars alike, were sure to benefit from his help and advice.

His friends will always remember his slightly crooked grin, his wit and his colorful expressions. Most importantly, he will be remembered for his irrepressibly positive attitude toward life, an attitude that enriched those who had the good fortune to know him.

A memorial service was held at ACOR on May 14 and the next day he was buried at Petra—on a promontory overlooking the valley and his excavation. The place was chosen by, and given to Ken by the *Bidul*.

Robert Schick

The Kenneth Wayne Russell

Memorial Trust

In honor of Kenneth W. Russell, and to invest in the archaeological heritage of Jordan, a memorial trust has been established by his colleagues and friends.

The trust will be used to provide travel fellowships to students of any nationality who wish to conduct archaeological and related research in Jordan; to provide

scholarships for higher education in archaeology and related fields for residents of Jordan; and to provide assistance for the education of the children of the *Bidul* Bedouin.

The management of the trust will be undertaken by ACOR, as will all facets of the program, e.g., advertising, candidate selection, disbursement of funds, final reports, etc. The Trust will be an endowment and only the interest earned will be spent to support the program. Donations, earmarked for the Russell Trust, may be made payable to ACOR, c/o ASOR, 3301 North Charles St., Baltimore MD 21218.



Albert E. Glock

in memoriam

Dr. Albert E. Glock was fatally shot by a masked gunman on January 19, 1992, in Bir Zeit on the West Bank. He received theological training at Concordia Seminary, St. Louis, Missouri, and thereafter began graduate studies at the University of Michigan Department of Near Eastern Studies. He received his Ph.D. in 1968, writing a dissertation under my supervision on *Warfare in Mari and Early Israel*. For several years he was on the faculty of River Forest College, Illinois, and during that time became affiliated with the excavations at Tell Ta'anek under the direction of the late Paul Lapp. He was director of the American School of Oriental Research, Jerusalem in 1975-76.

In 1976, he became professor of archaeology at Bir Zeit University and later, head of its Institute of Archaeology. He was deeply involved in the preparation of the Ta'anek archives for publication, as well as the training of students in the archaeological program in spite of the problems created by the present situation.

Dr. Glock was highly esteemed by his colleagues and students, and his untimely death is a great loss to the cause of education in the Near East and to Palestinian archaeology. His industry, sound judgment and intellectual integrity will be sadly missed.

George E. Mendenhall

Tuwaneh and the *Via Nova Traiana*

Zbigniew T. Fiema

Between January and June 1992, the author assessed the spatial and temporal occupation at Tuwaneh, a Nabataean through Byzantine period site in southern Jordan; analyzed architectural remains at the site; surveyed the local road network; and interpreted the finds within the framework of the culture history of southern Jordan during the classical period.

Despite its impressive appearance, Tuwaneh has received little attention. Brief descriptions were written by R. E. Brünnow and A. von Domaszewski, A. Musil, N.



Tuwaneh

Z. Fiema

Glueck, and S. Hart. Because the major Roman highway in Jordan, the *Via Nova Traiana*, passes through the site, it is generally identified with the *Thana/Thoana* of Ptolemy, and with *Thornia* of the *Tabula Peutingeriana*.

The site of Tuwaneh is located ca. 5 km south of the road between Tafila and Jurf ed-Darawish, on the slopes of two hills separated by the Wadi et-Tuwaneh. The area is well-known for the production of wheat and fruit; the soil is fertile and there is an abundance of rainfall. Superb construction materials, limestone, sandstone, basalt, chert and flint, are readily available in the area. Although no natural springs were located during the site survey, the numerous cisterns at the site, some utilizing natural bedrock cavities, imply that there was extensive water conservation by the inhabitants of ancient *Thana*.

No modern construction exists on the site, but it has suffered from other activities, including the construction of a road leading south from the Tafila-Jurf ed-Darawish road. The road, located on the slope of the

northwestern hill of the site, cuts through numerous ancient structures.

The site measures roughly 800 m (E-W) by 450 m (N-S), and is thus one of the larger sites in Jordan. The architecture is almost entirely of stone—irregular basalt boulders, roughly hewn stones and well-made ashlar limestone and sandstone blocks. For the purposes of this study, Tuwaneh has been divided into “complexes,” i.e. distinguishable units or isolated structures (46 in total). Each complex has been described, photographed, and surface ceramics collected. Among these, the most interesting is C14/15, a large building first published by Brünnow and von Domaszewski. Their sketch seemed to show a Nabataean temple associated with two adjacent courts; further analysis during the present project

shows that C15 is a tripartite, rectangular building with walls of ashlar (embossed) blocks, preserved up to 4 m high. The internal division and architectural details suggest at least two phases of use and rearrangement, and largely exclude a sacral character. Without detailed architectural study and stratigraphic soundings, observations on the date and character of the structure are speculative, but C15 may be a caravanserai.

Complex 16 is notable for the large number of ceramic pipe fragments found on the surface, as well as a number of square and round bricks, which could have been used as the posts in a *hypocaustum* system. Remains of a brick wall

visible in a robbers' pit inside the complex and adjacent fragments of an octagonal stone wall indicate that Complex 16 is part of a bathhouse, possibly the *caldarium*. Complex 2 includes a very well-preserved, subterranean multi-chambered tomb of exceptional construction. The considerable differences among the various complexes in the quality of construction and building materials suggest several major phases of occupation.

Tuwaneh and its environs were frequented or even inhabited during prehistoric times. Several samples of Middle Paleolithic era (ca. 40,000 B.P.) through Neolithic era stone implements were collected from the surface. The Iron Age pottery collected totals less than 1% of the sample. Tuwaneh probably became urbanized in the 1st century B.C., and its prosperity may have been the result of its location on a trade route, and further enhanced by the construction of the *Via Nova Traiana*. Fine examples of 1st century B.C. through 4th century A.D. Nabataean Painted and Plain Wares, as well as imported wares including Western *Terra Sigillata*, are abundant.

The settlement prospered in the Byzantine period, but Late Byzantine wares are rare, and the transitional types into the Umayyad period are practically non-existent. The final demise of the Classical period town cannot be fully understood without excavation but it is probable that the settlement declined considerably or even ceased to exist toward the end of the Late Byzantine period. Ayyubid-Mamluk pottery at the site indicates that some parts of the Classical period town was reoccupied. Periods after that are poorly attested at the site.

The section of the Roman road near Tuwaneh is one of the best preserved in Jordan, but the road itself and the archaeological remains along it face almost certain extinction from human activities such as road construction and field clearance for farming. Sections of the road have been exposed by bulldozer activity; in places, the Roman road itself has been re-surfaced. Additionally, many milestones have been displaced or overturned.

The total length of the road surveyed in this project was ca. 21 km. The ancient engineers clearly preferred straight sections, i.e. the road has a more northerly course than the modern track which closely follows it. In many places, the road, which is 5.90-6.20 m wide, is marked by curbstones.

In all, 42 sites along the road, including Tuwaneh itself, three large forts and 8 sites previously visited by the Wadi el-Hasa Survey, were recorded. The majority (14) of the rest were small structures (watchtowers). Additionally, there were: 12 milestone locations; three lithic/pottery scatters (possibly campsites); one extensive water installation; one hilltop stronghold; one small structure which is perhaps a caravan-serai; one dam; and five exceptionally well-preserved stretches of the road itself. In total, 49 milestones were recorded, in association with 21 milestone shaft fragments. Most of the inscriptions on these were so badly weathered as to be illegible.

One interesting find was a painted milestone, dated to Constantine, and thus probably the latest in the whole area. The letters of the inscription were painted directly on the surface instead of being chiselled out first and painted, as was the usual practice.

Numerous sherds dating to the 1st century A.D. were collected; these indicate that this route was already used prior to the construction of Trajan's Road (i.e. well before A.D. 106-14). The Late Roman and Early Byzantine periods are the best represented. Although Late Byzantine sherds were also found, their frequency seems to decrease with the increasing distance away from the main settlement of the entire area, Tuwaneh.

The results of the survey of Tuwaneh and the nearby section of the *Via Nova Traiana* generally support the author's prior assumptions. The area was relatively prosperous during the Nabataean to Late Roman periods (1st century B.C. to late 3rd century A.D.); this prosperity was associated with intensive long-distance commercial traffic, and was reflected in the growth of Tuwaneh. The presence of quantities of imports and the well-maintained and guarded road system are further evidence for the settlement's prosperity. The Early Byzantine period (4th-5th centuries A.D.) was also marked by well-developed settlement patterns, reflecting an unparalleled expansion into marginal lands for intensive agricultural production as well as the continuity of interregional trade. However, during the later Byzantine period (5th to early 7th centuries A.D.), southern Jordan experienced economic decline marked by a gradual decline in urbanism, growing isolation of settlement clusters, the abandonment of military infrastructure, and a gradual disappearance of interregional means of communication. Some sections of Trajan's Road fell into disuse, but others (close to large settlements such as Tuwaneh) were still used, maintained, and guarded by military outposts. Future studies to be conducted by the author on the site and in the environs of Tuwaneh should further strengthen these conclusions.



Dr. Zbigniew T. Fiema

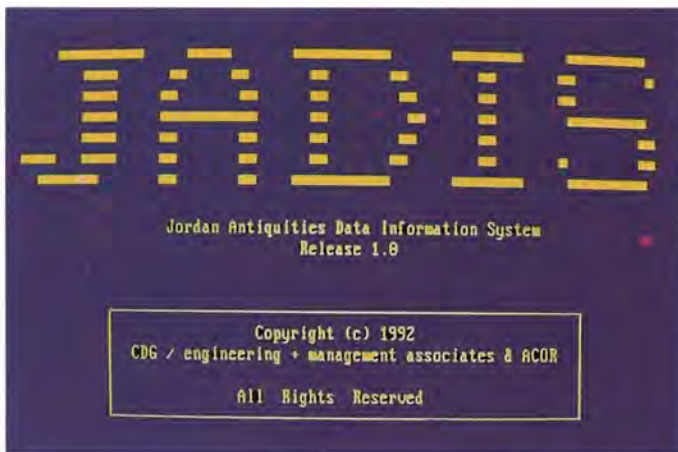
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The author would like to thank the United States Information Agency and ACOR for the grant which financed this research. Assistance was also received from Dr. Safwan Tell, the Director-General of the Department of Antiquities of Jordan, Mr. Jihad Darwish, the Inspector of Antiquities at Tafila, as well as from Dr. Khairieh 'Amr, Mr. Glen Peterman, Dr. Pierre M. Bikai, Dr. Patricia M. Bikai and Mr. Chryssanthos Kanellopoulos.

ACOR'S Development Projects

Cultural Resource Management

Data encoding for the JADIS (Jordan Antiquities Database and Information System) project is continuing at the Department of Antiquities Registration Center. The work is being done under the supervision of CRM archaeologist Gaetano Palumbo. More than 3,000 sites have been fully encoded so far.



In the meantime, the software which will manage this information has been developed by Ms. Linda Faris and Ms. Nadine Mushahwar of CDG Management and Associates, under Dr. Palumbo's specifications. The software is now being tested, and training is being provided at the Registration Center by Dr. Palumbo on MS-DOS, Windows, and a JADIS test module on a powerful 80386 CPU-based computer. That machine, obtained with the assistance of ACOR Trustee Mohammad Asfour, is on permanent loan from ACOR to the JADIS project. JADIS will allow the production of various site lists (by name, by geographic coordinates, by period of use, by level of preservation, etc.), all available at a key-stroke.

The CRM Project has recently been extended for two more years thanks to a generous grant by USAID. This extension will allow the JADIS project to be completed and will also allow further refinement of programs of coordination between the Department of Antiquities and development agencies whose projects may threaten Jordan's archaeological heritage.

Aqaba/Ayla

The early Islamic city of Ayla has been the focus of archaeological investigations since 1968. The excavations since then have allowed a reconstruction of the history of the city, from its foundation as a *misr*, probably around A.D. 650. The following centuries under the Umayyad and Abbasid dynasties reflected a prosperity deriving from international trade and Ayla's importance as a station on the Hajj routes. Under the Fatimids,

a series of catastrophes, both natural and political, led to its abandonment in the early 12th century.

From the initial stages of the research, there has been an explicit program to present and preserve this history and its physical remains. Following the 1987 season, these efforts resulted in a series of English and Arabic signs on the site, a large exhibition which has become a permanent museum in Aqaba, and a program of wall consolidation and reconstruction. Further, minimal fencing around the site has encouraged visitors, both Jordanians and foreign tourists, to explore the remains as an archaeological park. The concern with education and accessibility has resulted in high levels of awareness and appreciation of the antiquities; an indication of this success is the almost total lack of vandalism on the site during the past five years.

The aim of the 1992 season, under a grant from USAID, was to determine whether it would be possible to further enhance the touristic potential of the site by reconstructing the Syrian Gate of the city as a visitors' center. The elevation provided by the reconstructed gate would allow a visitor to comprehend the structure of the city easily and to recognize how the excavated portions fit into the whole plan. The view would change an apparently random scatter of holes in the ground into a unified urban entity. The specific program of the season was to see whether it would be possible to build the center without damaging any antiquities.



General view of the Aqaba/Ayla excavations, 1992. The city wall is to the left.

D. Whitcomb

The results may be outlined briefly. The area now excavated measures 20 m x 10 m and has reached a depth of over 4 m along the inside face of the original city wall. This wall and the attendant structures have been extensively damaged by an iron water pipe and a deep drainage trench. Although these intrusions complicated

the recovery of reliable archaeological information, the history of the gate may now be presented. The two sides of the Syrian gate had very different histories. North of the gate, the inner face of the wall was preserved to almost 4 m. The wall foundation and original room paving, with numerous Umayyad artifacts, were recovered. The doorway into the north flanking tower was completely intact. The city wall and walls of the original room had a plaster coating. Later walls of stone and mud brick, late Abbasid or Fatimid, showed serious instability of construction or possibly earthquake damage.

South of the gate, the city wall was almost entirely gone, removed down to the foundation. In place of the original structures were well-made stone walls, over 3 m in height, forming a building extending northwest across (and outside) the city wall. This building is clearly datable to the early Abbasid period and holds important implications for the history of Ayla. There is clear evidence of destruction in the 748 earthquake, of rebuilding and expansion of the city in the early Abbasid period, and of continuing prosperity throughout later Abbasid times. Between these two sides of the city gate was the Syrian street. As is usual in archaeological excavations, these results present a mixture of expected patterns and specific events. Information on architectural construction and artifactual deposition reproduces patterns already determined from previous excavations. Details of the early Abbasid building are welcome corroboration of inferences found elsewhere on the site. Finally, accidental discovery of specific events, such as a hoard of gold dinars, is part of the drama which makes archaeology interesting.

It has been determined that the construction of the visitors' center will not destroy remaining antiquities. The archaeological research which has been carried out in the area has successfully mitigated any adverse impact that the construction of the building might have produced.

Donald Whitcomb

The Temple of Hercules

The excavation component of this is now over and the restoration phase is in full swing. Details of the



Reconstruction of the Temple of Hercules © J. Guikema

project were given in last *Newsletter* (no. 3.2). Restoration by architect Chryssanthos Kanellopoulos of the podium at the back of the temple is nearly complete and work will begin on the colonnade this summer.

Madaba Mosaic Shelters

Architect Ammar Khammash continues work on the shelters over the Church of the Virgin and the Church of the Apostles. The parts of the Madaba Archaeological Park that will be used for the Mosaics School are also under development. The project, also explained in *Newsletter* no. 3.2, is supported by USAID and the Canada Fund. The school itself is being created by the Italian government.



A. Khammash and C. Kanellopoulos © J. Guikema



Michele Piccirillo

© J. Guikema

The Mosaics of Jordan

ACOR has received a grant from USAID for the publication of Dr. Michele Piccirillo's *The Mosaics of Jordan* (ACOR Publication no. 1). Patricia Bikai is the editor and it is presently in the color-separation stage. Printing will probably begin in late autumn and it is expected to be available by the end of the year. The book will contain 376 pages, over 300 of them in full color.

Geographic Information Systems and Archaeology

Glen Peterman



Fig. 1. STGMP Study Area, Central Jordan

Since 1989, the Southern Transjordan GIS Mapping Project (STGMP) has been opening a new frontier in archaeological method and theory in the Middle East. Under funding from the ACOR Teagle Fellowship, the Fulbright-Hays Program and the ACOR-USIA Junior Fellowship, STGMP has adopted the computer-based Geographic Information Systems (GIS) database approach to addressing issues of archaeological interest.

The project's use of this new tool (see "GIS: Archaeology's Latest Tool," forthcoming in *Biblical Archaeologist*) is grounded in the fundamental anthropological premise that human behavior is patterned, and the process of decoding those patterns can yield greater understanding of cultural change. Following this, the premise of the project is that ancient as well as modern settlement behavior is inextricably linked with the land-

scape and ecological resources. Thus, the site locations *themselves* have left us a record of patterned human behavior which can be decoded by examining environmental factors. It should therefore be no surprise to any anthropologist to learn that the locations of archaeological sites are certainly *not* the outcome of wholly random behavior and are not randomly distributed across the landscape. Were it otherwise in the Middle East, one might expect to find *tell* formations on vertical cliff faces, caves or rockshelters in a sea of sand-dunes, or lithic scatters located on the surface of the Dead Sea. Quite to the contrary, Bronze Age (ca. 3200-2000 B.C.) settlements in Transjordan (fig.1) have been found by the project to be located on a narrowly restricted range of landforms. Using GIS, these landforms can then be described by highly complex mathematical models comprising numerous environmental variables, such as elevation, slope, distance to water, etc.

Of course, when empirical and probabilistic settlement models are produced for restricted temporal data (for example: EB II, EB III and EB IV), comparisons can be made which allow us to understand aspects of ancient cultures which were simply not observable before. In particular, it is now possible to make far more objective and informed inferences about demographic shifts, about the use of land and perhaps even about "culture boundaries."

Although this new technology will soon have a dramatic impact upon research, particularly in survey methodology, analysis and publication, its impact will be even more important in Cultural Resource Management (CRM). Because of the unique way that GIS technologies manage geographic, topographic and other spatially linked data such as locations of archaeological sites (figs. 2-3), GIS has given the CRM specialist some valuable new tools. Now it is possible to study and assess the impact of private and public sector development upon

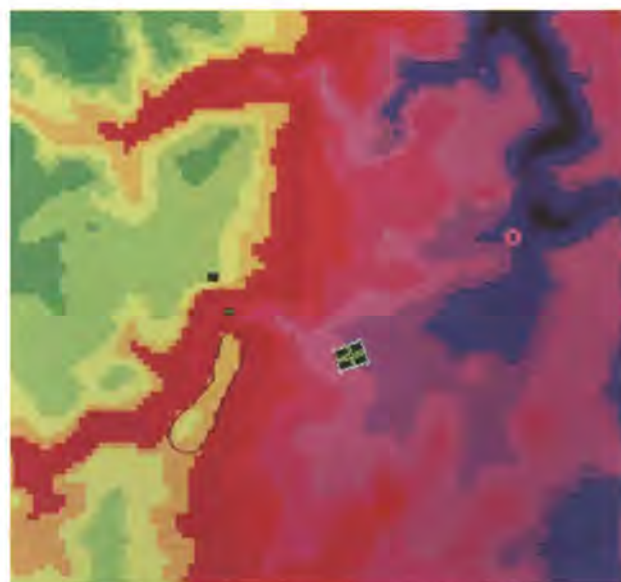


Fig. 2. Lejjun Area Digital Terrain Model (DTM)

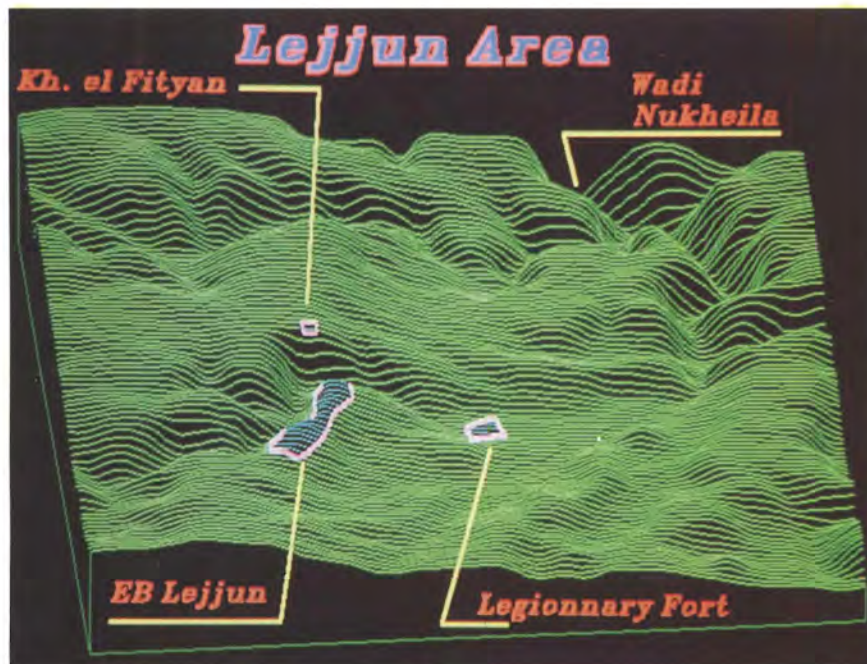


Fig. 3. Orthographic Perspective of Lejjun Area

archaeological resources sites, and to produce maps of endangered areas.

An irrigation dam once planned for the Wadi Rumeil by the Ministry of Water and Irrigation provides us with an example of the utility of GIS. Using a GIS model of the landform which includes the location of the dam (fig. 4), it is a simple matter to project the areas which would have been subjected to inundation by the reservoir, and to project other "impact areas" which would have been affected by

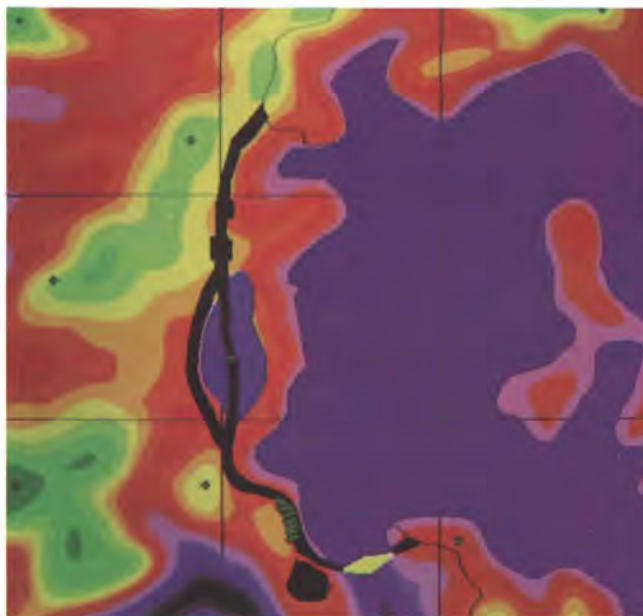


Fig. 4. Rumeil Area DTM with proposed dam (yellow); new and alternate roads (black), sites ("+"), predictive area (blue) and reservoir

construction activities. The power of GIS for CRM, however, is apparent when feasibility and impact studies include the locations of known archaeological sites, and probabilistic models of where other sites are likely to be. The use of GIS to map all three types of information simultaneously (landform, known locations and models) provides us with the opportunity to make informed CRM and development decisions (fig. 5).

In the case of the Rumeil Dam, probabilistic models produced from a research context give archaeological survey teams a headstart in suggesting where to concentrate their efforts. Additionally, knowledge of known site locations gives advance warning to CRM professionals about endangerment due to construction plans, thereby allowing "rescue" excavation. Finally,

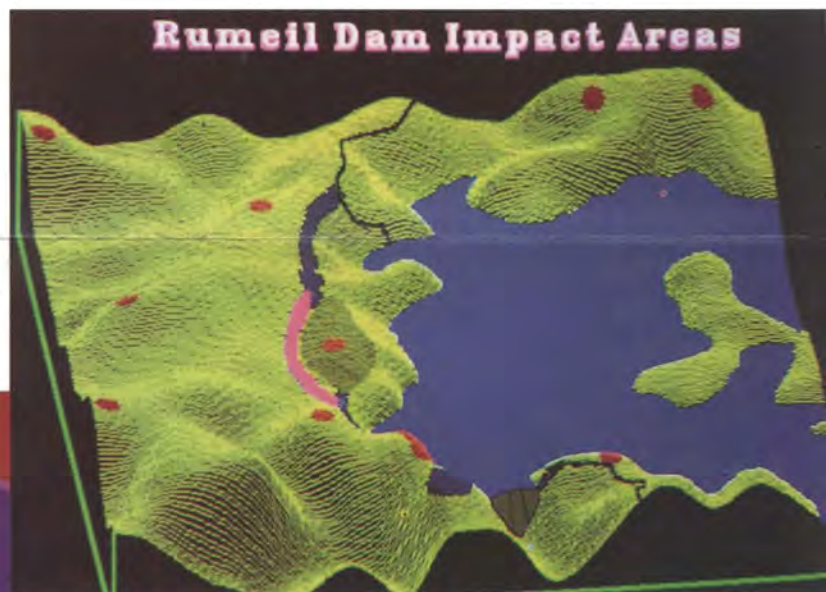


Fig. 5. Three-dimensional view of Rumeil Area with roads (black), sites (red), and alternate road (pink)

knowledge gained from GIS modelling also adds the possibility of changing development designs to avoid site destruction. This utilization of GIS has become commonplace at the university, state and national governmental level (environmental protection agencies, etc.) in the U.S. and may soon become a reality for Jordan [see p. 6].

When the linkage of site location databases with research and management GIS is finally accomplished, we will surely be looking at a dramatically new environment for archaeological research and cultural resource preservation.

Director's Report

Pierre M. Bikai

Fellows in Residence

Burton MacDonald completed his term as the Dodge Fellow in June. The three Arabic Speaking Academic Immersion Program scholars for the spring semester were Russell Hopley, David Mehall and Ranjit Singh. Glen Peterman, Zbigniew Fiema and Jay Guikema arrived in late winter for varying stays on their USIA Fellowships.

Information about ACOR's Fellowships can be obtained from ASOR, 3301 North Charles St., Baltimore MD 21218.

Development

The three offices at the end of the corridor on the basement level were converted to bedrooms; each now has a bath. A shower was installed on the sub-basement level so that the workrooms there can be used as overflow housing. To make up for the loss of work space, four rooms similar to the study carrels in the library have been built in the large room below the library. Resident photographic specialist, Jay Guikema, was able to organize our darkroom and our slide collection.

Conservators Noël Siver and Thomas Roby have been involved in the design of, and procurement of equipment for, the ACOR Conservation Laboratory, funded by a grant from American Schools and Hospitals Abroad. The lab will soon be available for use by any project in Jordan.

Director's Activities

I have been appointed to teach at the University of Jordan; in the spring I served on the M.A. committee of Motassim Redouane. This summer I am conducting a field school at Khirbet Salameh which is on the other side of ACOR's driveway. This is a revival of a long term relationship between ACOR and the University's Department of Archaeology.



Dr. Pierre Bikai, M.A. student Motassim Redouane, Drs. Mahmoud Abu Taleb and Mu'awiyah Ibrahim



Minister of Tourism and Antiquities, Yanal Hikmat, visiting the display area at the Irbid Conference

The Irbid Conference

Under the patronage of H.R.H. Crown Prince Hassan, the 5th International Conference on the History and Archaeology of Jordan was held in mid-April at the Jordan University of Science and Technology (JUST) near Irbid. The theme of the conference was "Art and Technology throughout the Ages." ACOR was bursting at the seams during that period.

Lectures at ACOR

Nov. 4: "Recent Work in the Burqu' / Ruweishid Region," Dr. Alison Betts.

Jan. 20: "The Origin of the Rod and the Ring," Dr. Pierre M. Bikai.

Feb. 20: "The Early History of Arabic," Dr. George Mendenhall.

Feb. 24: "Ammonites, Moabites and Edomites: Literary and Archaeological Evidence from the Late Second and First Millennium B.C.," Dr. Burton MacDonald.

March 17: "Pella in the Bronze and Iron Ages," Mr. Stephen Bourke.

March 29: "Continuity or Replacement? Modern Human Origins Research in 1991," Dr. Geoffrey Clark.

April 27: "The Pella Rest House," Mr. Ammar Khammash.

June 17: "The History of Christianity in Petra," Dr. Robert Schick.

June 29, "The Phoenicians: Problems and Progress in Research," Dr. Patricia M. Bikai.

Library

The contributors to the library since the beginning of the year include: Abdullah Ahmad, John Lawton on behalf of *Aramco World* magazine, Marcel Beaudry, Hans Dieter Bienert, Michelle Biewers, J.M. Blázquez-Martínez (Consejo Superior de Investigaciones Científicas), Robin Brown, Geoffrey A. Clark, Nancy Coinman, Michele Daviau, Friedrich Ebert Stiftung, Diana Edelman, Ibrahim Fayoumi, Gillian Flynn, Philip C. Hammond, Niels and Lise Hannestad, N. Van Hear, Fred Hiebert, the Estate of Donald James Harald Higgins, Martha

Joukowsky, Fouroz Jowkar, Zeidan Kafafi, Norma Kershaw, Guadalupe Lopez-Montagudo, Burton MacDonald, Fatima Marii, Luigi Marino, Richard Mattersdorff, Gaetano Palumbo, Glen Peterman, Michele Piccirillo, Motassim Redouane, Roberto Sabelli, Robert Schick, Kay Russell Smallman, Tibor Toth, Fabio Vianello, and Donna Wright.

Former ACOR Directors Bert de Vries and James A. Sauer donated copies of their slide collections. Prince Ra'ad bin Zeid donated part of the library of his his mother, Princess Fahrelnissa Zeid. The family of Kenneth W. Russell donated his books, papers and slides.

The family of Gosta Werner Ahlstrom have established a memorial fund, one of the purposes of which is to assist the ACOR library. Donations through the Ahlstrom Memorial have come from Carol L. Browning, Peggy E. Edwards, Frances and Franklin E. Gamwell, Martha Morrow-Vojacek, Edwin and Heather Taylor and Christin Rattenborg. Volunteers in the library this spring and summer included Colene Erickson, Cheryl Guikema, Fatima Marii and Glen Peterman.

Donors to ACOR

The following friends of ACOR assisted us during recent months: Pat Ansley, Phyllis Bird, Roger Boraas, James Brashler, Roger Brummel, Helen and John Cecil, Sue Dennis and the children of Neilson Street, Catherine Detweiler, Corine S. Finnegan, Harold O. Forshey, Giraud V. Foster, Nan Frederick, Lawrence T. Geraty, Victor R. Gold, Norma Kershaw, Øystein LaBianca, Nancy L. Lapp, Richard E. Mattersdorff, George E. Mendenhall, Carol Meyer, Carol and Eric Meyers, Charles H. Miller, Doris S. Miller, Anne Cabot Ogilvy, Randy Old, Thomas Parker, Isobel Pelham, Alice and Thomas Pickering, Elizabeth E. Platt, Walter E. Rast, Paul W. Remezczi, Eleanor Robbins, Thomas

Schaub, Patti and Joe Seger, Eric Mark Shelton, Lydie T. Shufro, Leonard Sweetman, Jr., Elizabeth R. Taylor, Jane Taylor, John M. Topham, William J. and Barbara Urbrock, Cornelius VanNuis, Bert de Vries, Prescott H. Williams, Jr., Donald Wimmer, Willard W. Winter, Julianne Zimmerman, and the Zuckerman Foundation.

Donations to the Jennifer Groot Fellowship Endowment were re-



Silk-screen by Princess Fahrelnissa Zeid

ceived from First Interstate Bank, Bruce Gould, William C. Harris and Thomas Parker.

Donations of equipment were received from Susan and James Sauer and Charles H. Miller. Donations to the ACOR art collection came from Prince Ra'ad bin Zeid, Fu'ad Mimi, M. al-Melkawi, Jenny Bowker, and Larissa Najjar.

The cost of the *ACOR Newsletter* is partially subsidized by a grant from the United States Information Agency. We are also fortunate to have received advice and help from master printer Shishir Dutta on how to improve the *Newsletter* while keeping production costs down.

Around the House

* On New Year's Eve a major storm hit Amman and, by the next evening, ACOR was completely snow-bound. None of the staff could reach the building and program quickly turned from research to snow-removal and creative cookery including a pancake feast. We thought we had witnessed the "storm of the century" but it was only the beginning. February brought wave after wave of



ACOR Director Bikai in the snow

snow, culminating in a massive storm on Feb. 25 which completely closed Amman. Once again we were isolated and the twelve of us in the house shared duties: kitchen and shaking snow off the trees. The water meter froze and then exploded and pipes burst. Nova Scotian Burton MacDonald was quite at home with it and was recruited as a plumber to repair pipes. The building suffered some damage and we lost a number of trees.

* Congratulations to Anthi Koutsoukou who spent most of the year finishing her Ph.D. dissertation. It was accepted by the University of Edinburgh.

* Current ACOR sayings include: "It's not in my job description" and "You've been volunteered." The list of people who have been volunteered in the last months to do things beyond their job descriptions is too long to give here, but thank you to all of them.

The ACOR Library Seeks the Following Out-of-Print Books

- Betts, R.
1981 *Christians in the Arab East*.
Atlanta.
- Bossert, H. T.
1951 *Altsyrien, Kunst und
Handwerk in Cypern, Syrien,
Palästina, Transjordanien . . .*
Tübingen.
- Buhl, F.
1893 *Geschichte der Edomiter*.
Leipzig.
*Cambridge Ancient History V:
Athens 478-401 B.C.*
2d edition. Cambridge.
- Chehab, M.
1977 *Monnaies Gréco-Romaines et
Phéniciennes du Musée
National, Beyrouth, Liban. A
la mémoire d'Henri Seyrig*.
Paris.
- Danin, A.
1983 *Desert Vegetation in Israel and
Sinai*. Jerusalem.
- Dexinger, F.
1980 *Kultur aus der Wüste: Die
Nabataer. Katalog der
Ausstellung im Museum für
Völkerkunde in Wien*. Vienna.
- DiCastri, F.
1973 *Mediterranean-type Ecosys-
tems: Origin and Structure*.
Berlin.
- Donner, H.
1979 *Kanaanäische und Aramäische
Inschriften. Band 1*.
Wiesbaden.
- Ettinghausen, R.
1972 *From Byzantium to Sassanian
Iran and the Islamic World*.
Leiden.
- Grabar, A.
1979 *L'art paléochrétien et l'art
byzantin. Recueil d'études*.
London.
- Hasluck, F.
1973 *Christianity and Islam under
the Sultanate*. New York.
- Matthiae, P.
1962 *Ars Syra. Contributi alla storia
dell'arte figurativa siriana nelle
tà del Medio e Tardo Bronzo*.
Rome.
- Mitchiner, M.
1978 *Oriental Coins and their
Values. Vol. 1* New York.
- Neuville, R.
1951 *Le paléolithique et le
mésolithique du désert de
Judea*. Paris.
- Ottoson, M.
1980 *Temples and Cult Places in
Palestine*. Uppsala.
- Reicke, B.
1979 *Palästina. Historische
Archäologische Karte*.
Göttingen.
- Seyrig, H.
1973 *Trésors du Levant anciens et
nouveaux*. Paris.
- Thompson, H. O.
1970 *The God of Beth-Shan*.
Leiden.
- Zeist, W. van
1984 *Plants and Ancient Man:
Studies in Paleoethnobotany*.
Rotterdam.

The ACOR library also seeks the following issues of the *Bulletin of the American Schools of Oriental Research (BASOR)*: Nos. 1-5, 8, 13-15, 21, 23, 25-30, 33, 35, 37, 39-40, 61-62, 67, 87, 91, 97.

Meryle Gaston, a member of the Library Committee, serves at the 'clearing house' for donated books, which can be evaluated for income tax purposes. She can be contacted at: 18 E. 8th St., no. 3B, New York, NY 10003, or at the E.H. Bobst Library, New York University, 70 Washington Square South, New York, NY 10012.

ACOR and Its Newsletter

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The Numbering of the ACOR Newsletter

With this issue, the *ACOR Newsletter* is changing its numbering system. The first five issues were numbered 1 through 5. As the *Newsletter* may eventually appear more than twice a year, this issue is numbered Vol. 4.1 (1992). The previous issues become: No. 1 = Vol. 1 (1989); No. 2 = Vol. 2.1 (1990); No. 3 = Vol. 2.2 (1990); No. 4 = Vol. 3.1 (1991); No. 5 = Vol. 3.2 (1991).

Reader's Survey

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