



2020 and 2021
Seasons

The Pandemic Volume

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Archaeology in Jordan 3: 2020 and 2021 Seasons
Pearce Paul Creasman, John D. M. Green, and China Shelton, editors

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Cover image: Amman Citadel Project, 11 November 2021. Photo by Abed Al Fatah Ghareeb, American Center of Research.

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Contents

Map of Sites and Projects	vi
Introduction	1
MaDiH: Mapping Digital Cultural Heritage in Jordan	3
Prevention of Illicit Trafficking of Cultural Property Project	5
Sustainable Cultural Heritage Through Engagement of Local Communities Project	7
Mafrqa, Zarqa, Amman	
Assessment and Documentation Project for the Archaeological and Tourism Situation in the Eastern Desert	9
Irbid	
Tall Zira'a Environmental History Project	12
Tall Zira'a: Gadara Regional Project Publications	15
Bayt Ras Tomb Project	17
Bayt Ras Roman Reservoir	20
Khirbet Ghozlan	23
Jerash	
Jerash: Lower Terrace of the Temple of Zeus	26
Zarqa	
Khirbet al-Batravy	29
Balqa	
Wadi Shu'aiba: Tell Bleibil	32
Tall Hisban	35
Tall el-Hammam	38
Amman	
Amman Citadel	40
Amman Roman Baths Rescue Excavations	43
Amman: Khirbet Salameh	46
Amman: Abdoun Community Archaeology Project	49
Madaba	
Qasr al-Mshatta	51
Khirbat al-Mukhayyat : The Town of Nebo	54
Madaba Regional Archaeological Museum Project	57
Tall al-Mashhad	60
Khirbat Safra	62
Machaerus	64
Khirbat Iskander	67
Tall Dhiban: Dheban Roman Mausoleum Project	70
Karak	
Khirbat al-Balu'a	71
Karak	74
Expedition to the Dead Sea Plain	77
Maan	
Jafr Basin	80
Petra: Islamic Baydha	83
Petra: Ad-Deir	86
Petra: Temple of the Winged Lions	89
Petra: Architectural Earth-Sun Alignments	92
Petra: Sculptures	95

المحتوى

خريطة المواقع والمشاريع
مقدمة
مديح: مشروع مسح قواعد بيانات التراث الثقافي الرقمي في الأردن
مشروع منع الاتجار غير المشروع بالمتعلقات الثقافية
مشروع استدامة الإرث الثقافي بمشاركة المجتمعات المحلية
المفرق والزرقاء وعمان
مشروع تقييم وتوثيق المواقع الأثرية والسياحية في البادية الشرقية
إربد
مشروع التاريخ البيئي في تل زرعاً
تل زرعاً: منشورات مشروع جدارا الاقليمي
مشروع مدفن بيت رأس
خزان بيت رأس الروماني
خربة غزلان
جرش
جرش: المصطبة السفلية لمعبد زيوس
الزرقاء
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تل حسيان
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جبل القلعة
مشروع الحفريات الإنقاذية للحمام الروماني في عمان
عمان: خربة سلامة
عمان: مشه ٦٥ عمدة المحتشم ، الأدي
مادبا
قصر المشقي
خربة المخيط: مشروع بلدة نيبو الأثري
مشروع متحف مادبا الأثري الاقليمي
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قاع الجفر
البترا: موقع بيضا الإسلامية
البترا: الديبر
البترا: معبد الأسود المجنحة
البترا: التوافقات المعمارية بين الأرض والشمس
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Map of Sites and Projects



Visualization by Thomas Paradise

Introduction

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The 2022 volume of *Archaeology in Jordan* is the third in the American Center of Research's effort to summarize recent fieldwork in Jordan by collecting, in an independent journal, reports from researchers working on projects throughout the country. Twenty-two previous compilations were published in the *American Journal of Archaeology*; those reports are all also available as open-access content online. *AJ* 3 presents reports on projects that took place from January 2020 to December 2021, organized generally by governorate, from north to south (see map on p. iv).

Projects faced many challenges during the period covered herein due to the COVID-19 pandemic. Consequently, while *AJ* typically reports on fieldwork only, given the unprecedented conditions projects have had to navigate over the past two years, we present here the first (and, we hope, only) "pandemic volume," which includes many activities other than active fieldwork, all of which are equally critical parts of the research and publication process. We hope that sharing information regarding how different projects manage the traditionally less "visible" stages of knowledge production will lead to insight and inspiration for all concerned. We also suspect that recognizing the impact of COVID-19 on each other's work may prove cathartic for many, as all have struggled in this shared crisis.

Despite these difficulties, some eighty contributors have provided updates on their most recent achievements on thirty-five projects. Some were able to find the time and personnel to excavate, survey, produce new data, or otherwise work on site. New excavations took place, for example, at Tell Bleibil (pp. 32–34), the Temple of Zeus at Jerash (pp. 26–28), Tall Hisban (pp. 35–37), and Tall el-Hammam (pp. 38–39). The Karak Neolithic Survey began their long-awaited pilot survey project (pp. 74–76), and at Tall Zira'a researchers worked toward environmental reconstruction (pp. 12–14). Other teams caught up on analysis of extant data and artifacts, archival work, and publication (another form of active data production, of course). These include, among others, work by researchers at Tall al-Mashhad (pp. 60–61), at Khirbat Iskandar (pp. 67–69), and at Khirbat al-Mukhayyat (Town of Nebo Archaeological Project) (pp. 54–56), on the Petra Sculpture Project (pp. 95–96), in the Al-Jafr Basin (pp. 80–82), with the Expedition to the Dead Sea Plain (EDSP) (pp. 77–79), and with the Islamic Bayda Project (pp. 83–85). Collaboration and the creation and promotion of online venues and activities were also points of focus for some projects, as with the Madaba Regional Archaeology Museum Project (MRAMP) (pp. 57–59) and a revision of the Follow the Pots website (p. 79). MRAMP also carried out site maintenance and installed new interpretive signs in the archaeological park. The Balu'a staff developed a "stateside study season" at La Sierra University, where students could work and receive college credit (pp. 71–73).

The increasingly strong tradition in Jordan of centering cultural heritage management and engagement with the communities living in and near archaeological sites continued to grow during this period. The many examples include work by the Mapping Digital Cultural Heritage in Jordan group (MaDiH) (pp. 3–4) and the various projects supported by ACOR-SCHEP (pp. 7–8) and the Department of Antiquities (DoA) that were also able to continue work during the pandemic, at least periodically. Work progressed on the Amman Citadel path (pp. 40–42), at the Amman Roman baths (pp. 43–45), at Bayt Ras (pp. 17–22), at Khirbet Salameh just outside the American Center itself (pp. 46–48), and elsewhere. As ever, all of these projects are multi-component both methodologically and temporally, and

they employ ever-more-sophisticated techniques of recovery, technological evaluation, and scientific investigation.

The editors recognize that all authors acknowledge the support and partnership of the Department of Antiquities of Jordan. Due to the short length of these entries, many expressions of thanks and acknowledgment are omitted for the sake of brevity. During the time these field projects were undertaken, the director general was Mr. Yazid Elayyan, to whom all contributors expressed their thanks. Not all specific funding agencies mentioned by project directors are acknowledged, for the sake of being concise. Of course, every project relies on funding and support, often from their own institutions as well as from other sources. It is appropriate here to thank all who support these endeavors.

This volume of *AJ* was produced by the American Center of Research and funded through the American Center of Research's Cultural Heritage Fund and its Publication Fund. Layout and editing were finalized by the American Center's assistant director for publications and grants, Noreen Doyle. Samya Khalaf Kafafi and Hanadi Al Thaher confirmed all Arabic included here, and Tom Paradise created the map of site locations. Further information about many of these projects is available online via project websites (links are provided where possible) or on Facebook; for further information on individual projects, please contact the authors directly using the e-mail addresses provided with their bylines. All figures are courtesy of the individual project directors unless otherwise noted. It is the authors' responsibility to ensure that all works herein have been conducted in conformance with the regulations of all government entities.

MaDiH: Mapping Digital Cultural Heritage in Jordan

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The MaDiH: Mapping Digital Cultural Heritage in Jordan project is dedicated to Dr. Andrea De Silva Zerbini (1984–2019), our inspiration and driving force.

The rich and diverse cultural heritage of Jordan has attracted the attention of the research community to explore, study, interpret, protect, and present this heritage to the world. Several international, regional, and local organizations or individuals have produced meta(data) as part of their study of Jordan's heritage, in various forms (Zerbini 2018). The MaDiH: Mapping Digital Cultural Heritage in Jordan project was established to map the extent and type of existing datasets on Jordanian cultural heritage, to investigate technological requirements, and to set up a prototype national heritage repository, essentially aiming to link technology and cultural heritage in Jordan (Smithies et al. 2021) (Fig. 1). It is a Jordanian-UK collaboration between King's Digital Lab (KDL) at King's College London, the Hashemite University, the Council for British Research in the Levant (CBRL), the Department of Antiquities in Jordan (DoA), the Jordan Open Source Organisation (JOSA), and the Endangered Archaeology in the Middle East and North Africa (EAMENA) project.

The MaDiH project outputs were designed to be minimal so the focus could be placed on analysis and capability building. MaDiH launched an online catalog and prototype repository using the Comprehensive Knowledge Archive Network (CKAN) platform to present the collected data that were produced by the local and international research community on Jordan's cultural heritage. The MaDiH CKAN catalog quickly gained particular importance, filling an urgent need for a holistic view of cultural heritage datasets held across and outside Jordan. Three hundred twenty-five datasets were collected and entered into a CKAN repository, documenting tangible or intangible heritage ranging from solid institutional repositories to FileMaker databases and spreadsheets. It was initially installed at King's Digital Lab in London and intended as a short-term tool to facilitate data analysis, but it proved so valuable that it was migrated to Hashemite University for long-term maintenance and to support the project's data sovereignty goals.

Moreover, the team has produced a technical white paper that described the current state of Jordan's digital heritage infrastructure at both the micro (metadata/schema/ontology) and macro (repositories, network infrastructure) levels, complemented by a policy white paper that highlighted the alignment of the outcomes to national and international policies and standards and provided recommendations based on the analysis of the existing legal framework. Both papers were published in Arabic and





Fig. 1. A group photo of the MaDiH project team and partners in July 2021. (Photo courtesy of the MaDiH project.)

English to increase reach, in line with a broader commitment to support both languages as far as possible (including bilingual social media posts on Twitter and Facebook and bilingual blog posts on the project website). A series of public workshops with stakeholders from the cultural heritage field, including researchers, government officials, and IT developers was planned to collect data and ensure that the project fulfils the needs of the local community and is aligned to educational and commercial opportunities.

The first, “mapping” pilot phase of the project sought to map more than the technical terrain; it aimed to understand the current state, but also optimal next steps for the enhancement of Jordan’s digital cultural heritage infrastructure and associated stakeholders. It is one phase of a three-phase plan to map, build, and deliver digital cultural heritage (DCH) in Jordan. We hope to continue our project with future phases to improve and properly build a national repository for cultural heritage assets.

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- Zerbini, Andrea. 2018. “Developing a Heritage Database for the Middle East and North Africa.” *Journal of Field Archaeology* 43, sup. no. 1: S9–S18. DOI: < doi.org/10.1080/00934690.2018.1514722 >

Project website: madih-jordan.org

MaDIH CKAN project database: madih.hu.edu.jo

Prevention of Illicit Trafficking of Cultural Property Project

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Fig. 1. Department of Antiquities Warehouse. (Photo by Yaser Hashem.)

Around the world, every year thousands of artifacts disappear from museums, places of worship, libraries, and archaeological sites. From figurines to paintings, from coins to jewelry, religious items to archaeological finds, tens of thousands of cultural objects forming part of the world's human heritage are stolen. Conflict zones have become desirable targets for criminals, and southwest Asia unfortunately suffers from looting at an unprecedented scale. Located at the heart of this region, Jordan's role is an important one. It encompasses not only protecting its own rich and diverse cultural heritage but also those of its neighbors (Fig. 1). To support Jordan's efforts to protect its cultural heritage and to strengthen its role in the region, the Prevention of Illicit Trafficking of Cultural Property Project highlights shared values, advances bilateral cooperation, and promotes mutual understanding. It is providing training in best practices and skill-building to relevant professionals, Department of Antiquities (DoA) staff, and other stakeholders to enable the more effective implementation of the U.S.-Jordan memorandum of understanding to protect cultural property signed on December 16, 2019, which aims to restrict the trade of archaeological artifacts and antiquities.



AIJ 3

Prevention of Illicit Trafficking of Cultural Property Project

Through a grant from the Public Affairs Office of the U.S. Embassy in Amman and in partnership with the Department of Antiquities, this project activates the unit within the Department of Antiquities dedicated to the prevention of illicit and illegal trade of archaeological artifacts and antiquities by building the capacities of DoA staff and other stakeholders by providing the department with tools and equipment to strengthen the effectiveness of its efforts. On December 13, 2021, a meeting was held with the director general of the DoA, Dr. Fadi Balaawi, during which the project was presented to the director general and his team. Both parties agreed on moving forward with this collaboration, and an agreement between the American Center of Research and the Department of Antiquities was prepared; at the end of the month, it was under review by the director general's office, to be signed in 2022.

Another meeting at the DoA, with the director of excavations, planned a visit to the antiquities warehouse and discussed issues related to the selection process for trainees from the DoA staff. Thereafter, in order to evaluate the level of training needed by the DoA staff, a questionnaire form was designed, covering educational background, computer and internet usage, knowledge of legislation and conventions on cultural heritage, archaeological knowledge, and knowledge of antiquities markets.

Program objectives include status assessment and gap analysis, logistic support, and training courses for the archaeologists and other related staff of the DoA. The project has compiled bibliographic sources, including Jordanian legislation related to cultural heritage protection, international protocols, and agreements pertaining to cultural property. In preparation for developing the course material, academic publications related to illicit trafficking have been collected and reviewed. The focus is on current methods for preventing looting, identifying and tracking looted material culture, inventorying such objects, and storing and protecting them so that they remain viable legal evidence, as well as repatriation practices. To implement such activities, the project will provide the DoA unit with the needed technical support (including computers, specialized cameras, and software) and a training manual so that development of the unit can remain ongoing after the project is completed.

Project Twitter account: twitter.com/prevtrafficking

Sustainable Cultural Heritage Through Engagement of Local Communities Project

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Starting in 2014, ACOR has administered the USAID-funded initiative the Sustainable Cultural Heritage Through Engagement of Local Communities Project (SCHEP). SCHEP has directly and indirectly contributed to numerous archaeological initiatives and has developed and implemented programs to increase the heritage awareness of local youth with archaeology playing a large role in defining the historic context of structural remains and small objects. Community involvement of site improvement and cleaning of historic sites is also a method that reconnects locals to the heritage of the past while preserving archaeological features. Coupled with this, SCHEP has engaged in knowledge transfer and capacity-building, with a strong focus on methods of documentation and publication. This initiative introduced new technologies to Jordan including drone photography and augmented reality. To preserve the archaeological past, the experienced SCHEP team has put together impactful projects that have provided sustainable archaeological contributions.

Within the project objectives, SCHEP developed and implemented several theme-backed projects with multiple focal points. Of these, several supported and contributed to archaeological efforts. Despite the many obstacles brought about by COVID-19 in 2020 and 2021, SCHEP initiated several programs that supported archaeology, including supporting the Department of Antiquities in its proposed revision of the Jordanian Antiquities Law. SCHEP aided the DoA in its efforts to update the law and, in turn, supported the progression of preserving archaeological sites and objects.

SCHEP also focused on programs associated with several awareness projects espousing archaeology and site preservation through volunteerism and workshops, with a focus on youth. Volunteers enhanced the Khirbet Salameh site by clearing it of debris and improving the site's accessibility with a focus on safety, work that is detailed elsewhere in this volume. The interest in preserving archaeological sites extends to the archaeology clubs for youth created by the Friends of Archaeology and Heritage (FoAH) group and supported by SCHEP. The archaeology club is introduced in primary schools to expose the younger generation to heritage, such as archaeological sites, and the intangible history linked to their cultural past. The focus on youth continued with SCHEP's engagement of two interns for the Bayt Ras Tomb Project, who worked alongside professionals, obtaining knowledge on the international standards of documentation and the utilization of architectural plans.

SCHEP published a manual for handling museum artifacts and conducted a workshop for hands-on applica-





Fig. 1. Pottery training workshop by the Madaba Regional Archaeological Museum Project (MRAMP). (Photo by Dina Al Majali.)

tions. Furthermore, SCHEP instituted several projects of archaeology-related capacity-building initiatives. Among them was a pottery of Jordan workshop where trainees received an introduction to a chronology of ceramics in Jordan and focused on different time periods, including the Neolithic and Chalcolithic (Fig. 1). In conjunction with this workshop, SCHEP is developing a pottery of Jordan manual in partnership with the Madaba Regional Archaeological Museum Project (MRAMP), scheduled for publication in 2022.

Finally, SCHEP has also brought newer technology to compliment the recording of archaeological sites. Drone photography can document, as well as monitor, a historic site and be part of a photogrammetry program. Augmented reality was trialed at Khirbet Salameh. With its data, virtual tours can be developed to further the understanding of a site's historical significance and to present visuals that can inspire an individual's connection to the site, thus encouraging preservation.

The works described above are made possible by the generous support of the American people through the United States Agency for International Development (USAID). The contents are the responsibility of ACOR and do not necessarily reflect the views of USAID or the United States Government.

Assessment and Documentation Project for the Archaeological and Tourism Situation in the Eastern Desert

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Fig. 1. Qasr Burqa'. (Photo by Ahmad Lash.)

Despite the repercussions of the COVID-19 pandemic on activities and restrictions on the movement of people, which caused cessation of most archaeological missions during 2020–2021, the author took this opportunity to conduct a field project aimed at reassessing the state of the archaeological sites scattered in the eastern Badia. The eastern Badia was chosen as a target for this project for four reasons:

1. This region is rich in archaeological sites dating to a variety of historical periods.
2. Archaeological missions have been working at only a limited number of archaeological sites in the region.
3. Many archaeological sites in the eastern Badia have not received the protection or monitoring they require.
4. The eastern Badia has not been given the promotion it deserves, given the archaeological sites it contains, especially those sites considered rare site types in Jordan and the world.



From May to August 2020, the author led a project to redocument and evaluate most well-known archaeological sites, starting from the Wadi Al-Ghadaf area and ending in the Al-Ruwaished area, including Qasr Tuba, the Jelat dam, Kharanah IV, Qasr Al-Kharanah, Qusayr Amra, Qasr Uwained, Khirbet Al-Omari, Al-Hazeem Wells, Al-Ain Al-Saoda, the Umayyad reservoir, Ain Al-Qaisyah, Al-Azraq Castle, Ain Al-Sil, Usaykhem, Al-Shubayka, Qurma, Al-Qatafiyat, Al-Wesad, and Qasr Burqa' (Fig. 1). Documentation and evaluation work also included the Roman road that linked the Azraq area and the main stations of that road in the northern Badia, starting from Azraq toward Rujm al-Madaweer and Tulul al-Manasif, to the Huwaynet site at the Beshryya crossroad (Fig. 2). During this project, most of the desert kites spread between the Azraq and Safawi areas were recorded as well.

During the project, evaluation and documentation were carried out for each of those sites, determining vandalism and disturbances and related needs and also the availability of tourism components or potential components. The study also included composing a literature review and developing a viability analysis for tourism in the eastern Badia. This latter aspect aims to present some proposals to advance the tourism of the region, particularly trails or dedicated routes, which it is hoped will cover most of the important archaeological sites. Such a program would contribute to creating job opportunities in the region, as the eastern Badia is considered among the least developed for such purposes, despite the natural and archaeological diversity it contains.

The results of the project were divided into two parts. The first section was a comprehensive evaluation study for most of the archaeological sites in the eastern Badia, the strengths and weaknesses of each site, the level of threats facing each site, what is necessary to protect each site, and the possibility of placing it on the tourist map. This study was submitted to the Department of Antiquities and the Ministry of Tourism. The second section was a book in Arabic on the archaeological sites and places of interest to tourists in the eastern Badia, meant to serve as a summary reference on the most important archaeological sites there. It provides clear, basic information for interested decision makers, scholars, and tour guides. The preparation of and printing of this book were supported by the American Center of Research's USAID-funded Sustainable Cultural Heritage Through Engagement of Local Communities Project (SCHEP). I would like to thank Mr. Wesam Esaid, the head of the desert castles office at the Department of Antiquities, who joined me throughout the fieldwork trips.



Fig. 2. Traces of a Roman road. (Photo by Ahmad Lash.)

Tall Zira‘a Environmental History Project

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Fig. 1. The location of the three sequences TZ1, TZ2, and TZ3 in the former artesian spring on Tall Zira‘a, view from south. (Photo by M. Dal Corso.)

Tall Zira‘a is situated 4.5 km southwest of Umm Qais (ancient Gadara) in northwest Jordan. Excavations were carried out by the Biblical-Archaeological Institute Wuppertal and the German Protestant Institute of Archaeology in the Holy Land between 2001 and 2014 under the directorship of Dieter Vieweger and Jutta Häser in the framework of the Gadara Region Project. Recent excavations were conducted by Katharina Schmidt from 2018 to 2021.

The excavations revealed a settlement history from the Early Bronze Age to the Ottoman period. One main feature of the tall is an artesian spring in its center, which was surely a reason for the continuous occupation of the site. It was running until 2007, when it started to dry out. A drilling project at this artesian spring was conducted by the German Protestant Institute and the University Kiel/Germany with the financial support of the Gerda Henkel Foundation from November 2 to 21, 2021. It aimed to test the availability of the spring sediments as an environmental archive. This is an important part of the Gadara Region Project, which focuses not only on the settlement history of Tall Zira‘a but also on the environmental history of the Wadi al-‘Arab and the Wadi az-Zahar south of the ancient site of Gadara.



AJ 3
Tall Zira'a Environmental History Project



Fig. 2. The forest plot in the Ajloun Forest Reserve (Bergesh Forest), dominated by deciduous and evergreen oak. (Photo by M. Dal Corso.)

Fig. 3. Speleothem in situ in the cave on the northern side of Tall Zira'a. The sampled speleothem is in the rear, left. (Photo courtesy of the German Protestant Institute of Archaeology.)



The drilling equipment (cores and drilling rods) was fixed on a tripod during the recovery process. The coring process was carried out with a percussion driver and probe heads and steel drilling rods, all of a length of 1 m. The sediment was recovered by a hydraulic puller system. The 1 m sediment sequences were drilled and recovered subsequently from the same bore hole. Three sequences have been taken from the former spring area (Fig. 1). In the first series (TZ 1), a total depth of 3 m was reached before the equipment could not penetrate the sediment farther. In the second series (TZ 2) a total depth of 5 m was reached. The third sequence (TZ 3) is the most complete and reached a total depth of 7 m. Opening the cores, documenting and connecting the different sediment sequences, and searching for datable material was carried at Kiel University.

In order to get modern vegetation samples for comparison with the samples from the spring sediments at Tall Zira'a, to build up an archaeobotanical reference collection, to analyze the geochemical signature, and to look for the presence of phytoliths, a survey of modern plant material was conducted. Since natural or secondary forests of the region are rare, a local guide, Ahmad Al Omari, accompanied the team to remaining woodland plots where samples could be taken (Fig. 2). They were collected in the Dimni Forest (Umm Qais), 5 km northeast of Tall Zira'a, and in the Bergesh Forest (Ajloun Forest Reserve), 35 km southeast. The samples were composed of leaves, inflorescences, fruits, nuts, and seeds of some of the most common trees, as well as herbs and grasses.

In addition to the vegetation studies and an analysis of wadi sediments in the neighboring valleys, a speleothem was recovered from a small cave at the northern flank of Tall Zira'a (Fig. 3). The main objective was to investigate the suitability of the material for obtaining information about the local paleoclimate and to protect this natural archive against future damage.

Project website: tallziraa.de

Tall Zira'a: Gadara Regional Project Publications

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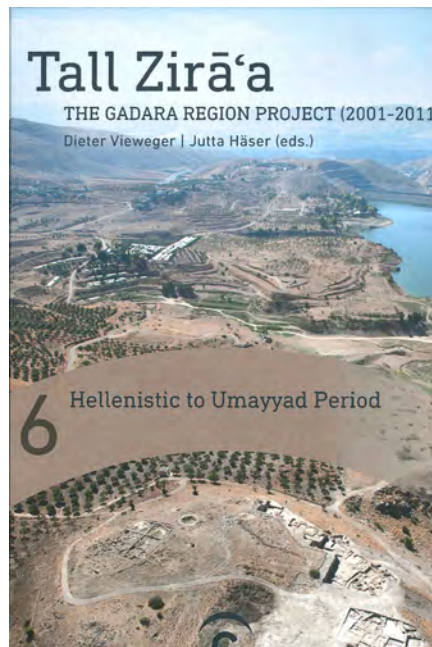
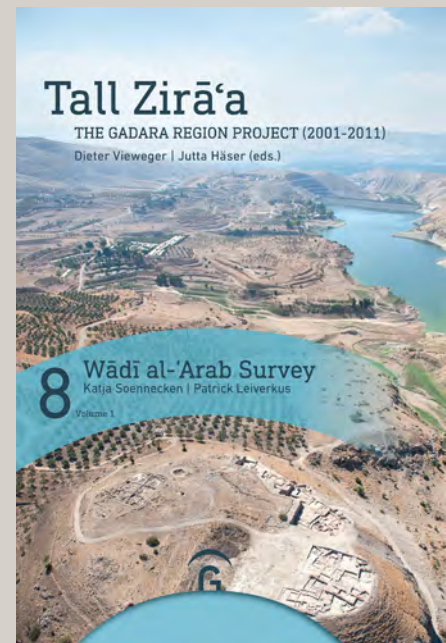


Fig. 1. *Tall Zira'a: The Gadara Region Project (2001-2011): Final Report 6. Hellenistic to Umayyad Period (Strata 8-3) Ceramic, Glass and Metal Finds*, published in 2020.

Fig. 2. *Tall Zira'a: The Gadara Region Project (2001-2011): Final Report 8, volume 1. Wādī al-'Arab Survey*, published in 2021.



The settlement hill Tall Zira'a is located in the Wadi al-'Arab in northwest Jordan, only 4.5 km southwest of Gadara/Umm Qais. Situated in a fertile landscape rich with water and arable soil and equipped with an artesian spring in the middle of the hill, it provided excellent living conditions for settlers. Therefore, the site was inhabited from the Early Bronze Age to the Islamic period.



The investigation of Tall Zira'a began in 2001 within the framework of the Gadara Regional Project conducted by the Biblical Archaeological Institute Wuppertal and German Protestant Institute of Archaeology in the Holy Land and directed by the editors. After an archaeological survey in 2001 and different geophysical explorations, excavations started in 2003 and continued until 2011. During this period, eighteen seasons were carried out in three areas comprising 3,500 sq m. Twenty-five strata from the Early Bronze Age to the Ottoman period were excavated in area I. The Iron Age II stratum was reached in area II and the Byzantine stratum in area III.

Volumes 1 (*Introduction*) and 2 (*Early and Middle Bronze Age*) of the final publication were published in 2017 and 2019. Volume 6 was published in 2020 (Fig. 1). It contains the detailed analysis of the ceramic finds from the Hellenistic to Umayyad strata 8 to 3 on Tall Zira'a, undertaken by Frauke Kenkel, as well as the metal and glass finds from the same strata and periods by Stefanie Hoss.

The double volume 8/1 and 8/2 presents the results of the Wādī al-'Arab survey carried out by Katja Soennecken and Patrick Leiverkus during the summer campaigns 2009 to 2011, also within the framework of the Gadara Regional Project (Fig. 2). The study area comprises the catchment of the Wādī al-'Arab except for the wider area of the modern city of Irbid. The aim of the survey was the diachronic analysis of the settlement history in the Wādī al-'Arab, complementing the results of the excavations on Tall Zira'a as the most prominent archaeological site in this region. Furthermore, Wādī al-'Arab is one of the easily passable ascents from the Jordan valley to the Irbid-Ramtha-basin, and it was part of trade routes connecting the Mediterranean region with Syria, Mesopotamia, and the Jordanian Highlands. The survey focused on the importance and shift of this route.

Volume 8/1 presents the research history, the methodological background of the survey, and an outline of the settlement types characteristic of the different periods, a section written by Katja Soennecken and Patrick Leiverkus. Selected ceramic, stone, and glass finds were studied and published by Frauke Kenkel, Benjamin Schröder, and Stefanie Hoss. Related research projects in the Wādī al-'Arab encompass studies on the landscape, vegetation, and natural resources which are reported by Katja Soennecken, Patrick Leiverkus, Linda Olsvig-Whittaker, Avi Shmida, Sabine Kraushaar, and Marwan Al-Raggad.

Volume 8/2 contains the detailed site catalog and photo documentation, as well as a list of finds for each site. Further results of the survey will be scrutinized in another study. Since the information about the archaeological sites in the wadi and its vicinity should be as up to date as possible, a review of former publications was included and evaluated.

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Project website: tallziraa.de

Bayt Ras Tomb Project

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The discovery by the Department of Antiquities of a painted hypogeum at Bayt Ras (Capitolias) in November 2016 was a major event for the study of Decapolis necropolises. Missions conducted on site from April 2017 within the framework of the Bayt Ras Tomb Project led by J. Haron and N. al-Adarbeh (both American Center of Research) and A. Lash (Department of Antiquities) confirmed the urgency of documenting this important and fragile testimony of cultural heritage. This was done between 2017 and 2019 by a Centre national de la recherche scientifique-École normale supérieure PSL, Paris, mission. The objective was to establish iconographic and epigraphic documentation in context, with the aim of vectorizing the 16.50 m-long frieze (Fig. 1). Beginning in 2018 with the sixty-five inscriptions, the project found its full dimensions thanks to an agreement with the American Center of Research's USAID-funded Sustainable Cultural Heritage Through Engagement of Local Communities Project (SCHEP), which financed the vectorization of the hundred or so scenes of deities, workers, scholars, animals, vegetation, construction scenes, libation, and so forth. The challenge was to reproduce the colorful rhythm of this composition in a way that not only presented all its originality in a scientific manner but also conceived of it as a working tool for future studies (e.g., description, analysis, comparison, interpretation).

The vectorization work, entrusted to Jean Humbert, began in October 2019, continued during the coronavirus containment period, and was completed in October 2021. A coordination was set up remotely between Humbert in Cyprus, the laboratory in Paris (Archéologie et Philologie d'Orient et d'Occident; CNRS-AOOrOc), and the American Center in Amman. The pictures were rectified and processed to match the line drawings made from the orthographies of the walls by the architect S. Bechetoille-Kaczorowski (Institut français du Proche-Orient). Then, a model file was elaborated from a vectorization drawing software, so that each element of a scene appears on a separate layer. Next, these "scene files" were assembled into "wall files" (south, east, north), always taking into account the archaeological state of the decor, since a layer reproduced alterations. This approach requires rigor, patience, and multiple adjustments, given the inclination of the walls, the bumpy surfaces, and a great wealth of motifs. It offers a better reading of the pictorial compositions alongside the reference photographs and a numbered cartography of the decorations. It aids the iconographic research by making clear the appearance of the divinities, in particular Zeus Kapitoliou flanked by the Tyches of Caesarea (Maritima) and Capitolias (identified by the epigraphists in Lyon [CNRS-Laboratoire HiSoMA (Histoire et Sources des Mondes



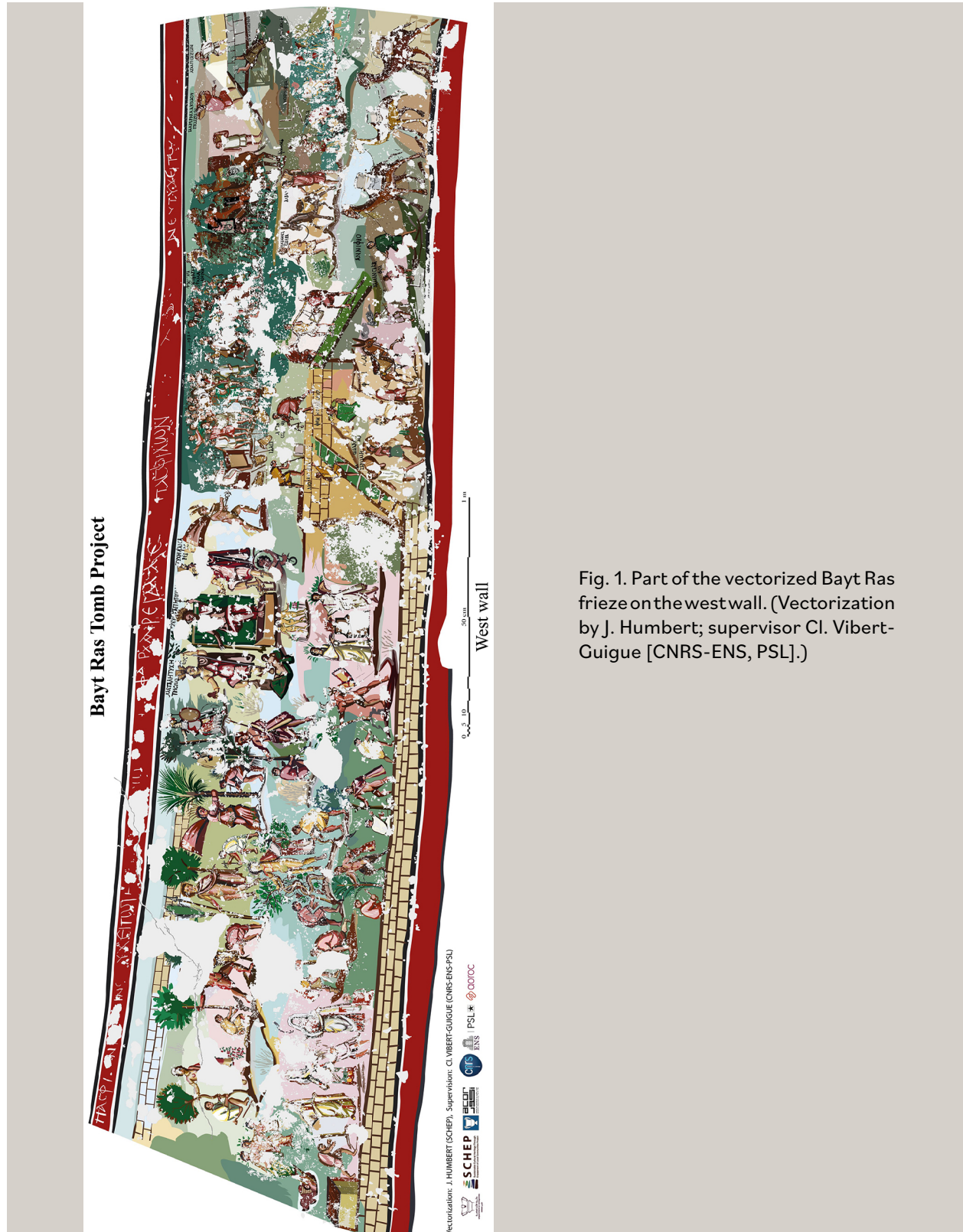


Fig. 1. Part of the vectorized Bayt Ras frieze on the west wall. (Vectorization by J. Humbert; supervisor Cl. Vibert-Guigue [CNRS-ENS, PSL].)

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Bayt Ras Tomb Project

Antiques]]], the constructions (enclosed monuments, building site), and vegetation. An infinite number of combinations are possible, with the workers of earth and stone, and their donkeys, camels, and tools. This rich pictorial heritage has allowed for the first time the testing of the vectorization technique on a large scale, with promising results in terms of archaeological documentation and iconographic analysis (Fig. 2). This project proved that it is possible to work and communicate at a distance, provided that the field recordings were treated as a priority.

The works described above are made possible by the generous support of the American people through the United States Agency for International Development (USAID). The contents are the responsibility of ACOR and do not necessarily reflect the views of USAID or the United States Government.



Fig. 2. Home and remote work during COVID-19 pandemic containment.
(Photo by Cl. Vibert-Guigue.)

Bayt Ras: Roman Reservoir (Berkah)

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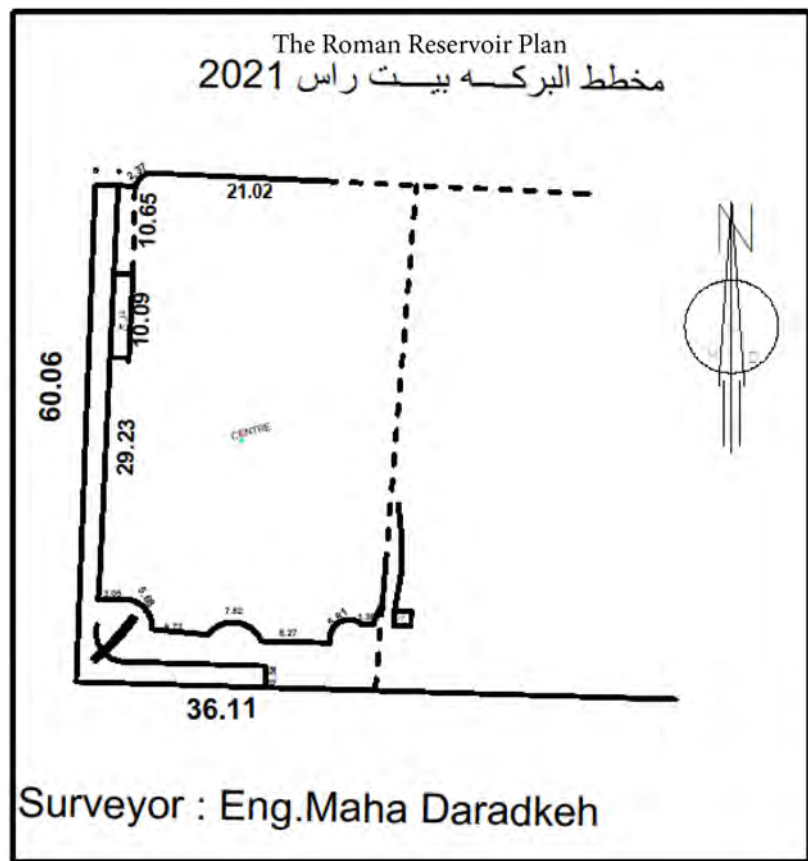


Fig. 1. Plan of the Roman reservoir in Bayt Ras.
(Plan by Maha Daradkeh and Saher Tuwaiq.)

A Roman-era reservoir, noted and inaccurately recorded by G. Schumacher (1890), is located in the western part of the ancient city of Capitolias, known today as Bayt Ras (Figs. 1–2). It was built in the 2nd century CE on the southern slope of the western part overlooking the archaeological hill of Irbid, which still bears witness to the Roman architectural impact in design and construction. Its walls were built of thick limestone and basalt. The reservoir is characterized by its large capacity, which is estimated at about 22,000 m³ (length: 55.64 m; width: 35.97 m; depth: c. 11 m) (Fig. 1).

The upper southern surface contains two water channels. One, in the southeast corner, is connected to a settling basin, where the water was filtered before descending through the channel to the reservoir. The other, in the southwest corner, extends diagonally between the inner and outer corner of the southern wall of the reservoir and has a yet undiscovered terminus. Any connection between this canal and any other





Fig. 2. Aerial photograph of the reservoir. (Photo courtesy of the American Center of Research.)

water systems in the city are similarly undiscovered. The topographic evidence of the area and its proximity to the hill area indicate the collection of water from the upper areas in Bayt Ras to flow into the reservoir. The evidence is the direction of the southern wall of the reservoir, which is oriented toward the hill. There are remains of the city wall extending toward the east and on toward the reservoir itself. We expect that these walls are connected to the southern wall of the reservoir, and that thus there is an architectural water-delivery system between the city wall and the reservoir.

The Plaster

The plaster on the walls, whose thickness is estimated to be approximately 6–8 cm, has three distinct layers: the first is a cement plaster mixed with lime and organic materials; the second is a layer of plaster mixed with small rounded pebbles; the third is a layer of fine cement mixed with lime, and its thickness is approximately 1 cm. The third surface layer contains several colors; we tentatively expect that these colors were used to measure the level of the water in the reservoir, but it is also possible that the colors resulted from calcifications from the deposition of salts on the surface.

Reservoir Staircase

Through excavations this season, the staircase of the reservoir was discovered on the western side. It has 24 steps, each measuring 30 cm by 15 cm by 2.10 m. The staircase

connected at the bottom with the reservoir floor. A small marble column is associated with the end of the stairs.

Reservoir Water System

During the excavation seasons from 2018 to 2021, a part of the water system that supplies the reservoir was discovered, composed of:

1. A channel extending diagonally between the outer southwest corner of the reservoir and the inner southwest corner of the reservoir. It measures 7.60 x 0.40 m and is similar to other Roman canals found in Jordan.
2. A rectangular channel built of stone, roofed, and closed with smooth plaster, measuring 39 x 1.42 x 22 m. Its construction was based on a slight descending gradient that follows the terrain lines, where the water flows smoothly from the source without damaging its walls and finally pours into the basin.
3. A confined basin with very fine plaster, connected at the western end with the covered channel connecting to the reservoir. By comparing this system with other water systems, this feature is considered a basin for the deposition of impurities before they reach the reservoir.

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Khirbet Ghozlan Archaeological Project

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Khirbet Um al-Ghozlan is an Early Bronze IV (2600–2000 BCE) period site located on a steep knoll above the Wadi Rayyan, north Jordan (UTM 749729E, 3588534N). The site is only 0.4 ha in size, and in this respect sits comfortably with our traditional understanding of the EB IV period, during which people abandoned large, fortified, mounded sites and dispersed into small, undefended, rural settlements. However, Khirbet Ghozlan is remarkable for a monumental enclosure wall that surrounds the entire Ghozlan knoll. Why defend such a small site (Fig. 1)?

The answer may lie in the site's upland location. Khirbet Ghozlan is one of several EB IV enclosure sites located on the well-drained slopes of the rift escarpment in areas well suited to upland horticulture. Such sites may have served as specialized processing centers for upland tree crops such

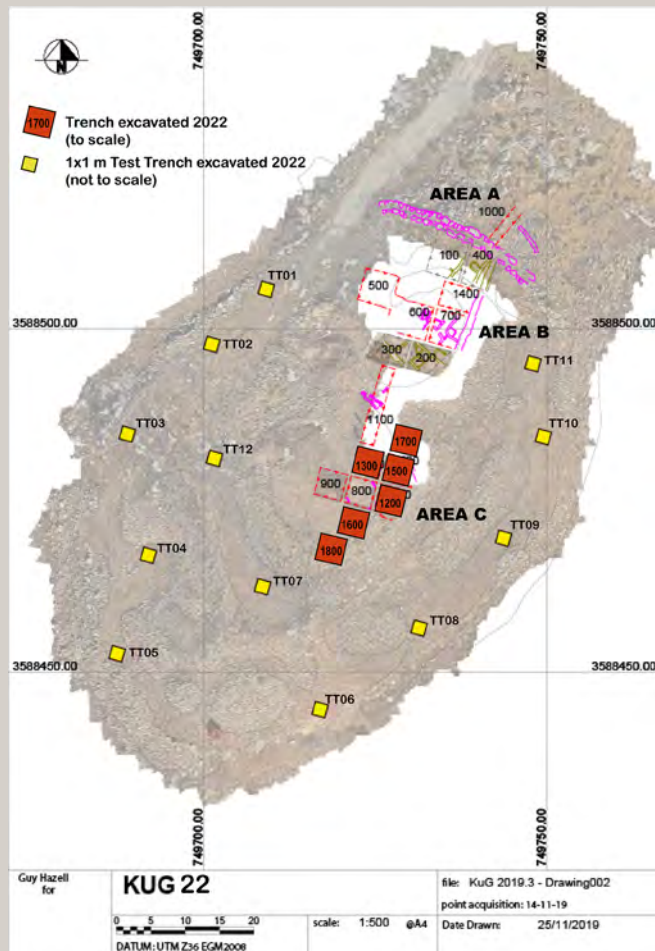


Fig. 1. Location of excavation areas and trenches in 2022. (Image by Guy Hazell.)



as olive (*Olea europaea*) and were defended to protect seasonally produced stockpiles of valuable liquid commodities, such as oil.

To test this hypothesis, the British Museum has undertaken three seasons of excavations: in 2017 and 2019, excavations investigated the enclosure wall (area A) and a so-called storage compound (area B); in 2022, the BM conducted a final season, 19 February–10 March 2022, once conditions of the pandemic allowed for travel. These excavations focused on a domestic compound (area C), as well as ten test trenches across the site, discussed below.

Area C

Area C denotes a flat terrace within a ring of heaped rubble. Limited excavations in 2019 exposed a possible courtyard (trenches 800 and 900) with associated architecture under the rubble ring (trenches 1200 and 1500). The 2022 excavations discovered that the rubble was tumble from a large, curved retaining wall in which rubble had infilled two parallel walls. The resulting rubble-filled wall defined the east side of a network of rooms (trenches 1200, 1500, 1600, and 1700) laid out against a central courtyard (trenches 800, 900, and 1300). The continuation of rubble tumble on the unexcavated west side of area C suggests that a network of architecture defined by the east wall actually encircles the entire terrace, with an open courtyard in its center (Fig. 2).

A doorway through the east wall (trench 1200) provided access to several rooms. Intriguingly, the east wall was constructed as segments between the compound's single-row walls, indicating that the internal walls were constructed before the external east wall was built. This relationship suggests the area C compound was constructed as a single event according to a carefully prepared plan, supporting similar conclusions drawn from excavations in areas A and B.

Several storage jars with charred lentils were discovered in one room (trench 1600), although the compound yielded fewer such jars than the “storage compound” (area B). In contrast, three rooms contained hearths of burned, flat stones consistent with domestic activity. These differences suggest that the area C compound was used for domestic activity.

Test Trenches

Ten 1 x 1 m test trenches (TTs) were excavated across the site to determine whether the entire area defined by the enclosure wall (0.4 ha) was occupied. Cultural deposits were detected in TTs east and west of the upper terrace (TTs 01, 02, 09, 11), but topsoil overlay natural and/or bedrock in TTs excavated south of area C (TTs 03, 04, 06, 07, 08, 12). We can conclude that only the northern half of the enclosed Ghozlan knoll was occupied—approximately 0.25 ha. This reduced site size further contrasts with the substantial construction of the enclosure wall and the planned layout of the buildings within, suggesting the site served a particular function within a complex rural landscape in upland Jordan in the late 3rd millennium BCE.

Acknowledgements

The 2022 season was funded by the British Museum (BM) Research Board, by the Friends of the Middle East (BM), and as a Gerald Averay Wainwright Fund Research Grant (University of Oxford).

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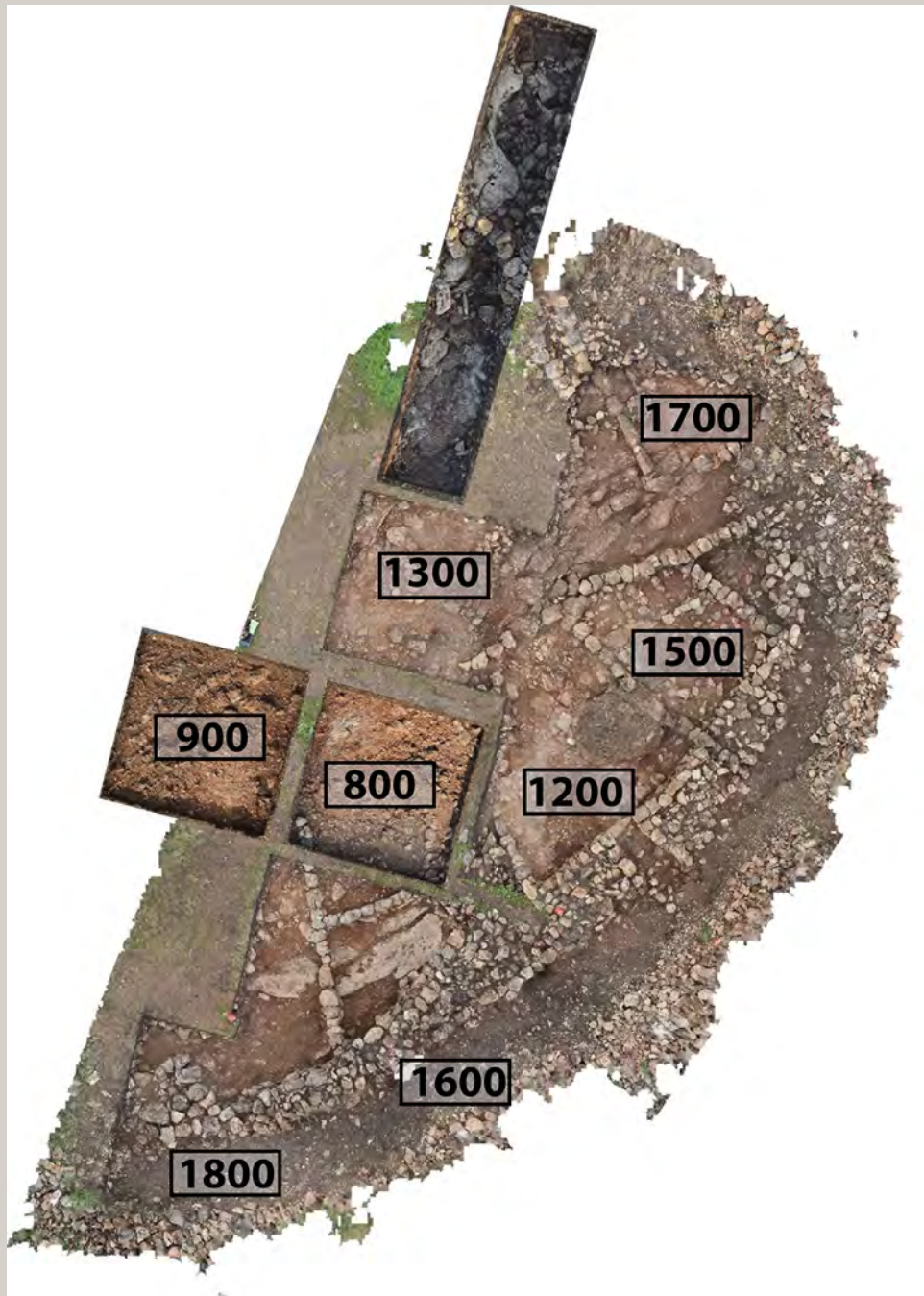


Fig. 2. Orthogonal plan of area C trenches after the balks were removed (north aligned to top of page). (Image by Guy Hazell.)

Jerash: Lower Terrace of the Temple of Zeus

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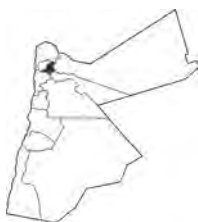


Fig. 1. The Umayyad room inside the Roman porticus with the stone substructure of its floor. (Photo by Stefanie Becht.)

Following an almost forty-year-long tradition of excavations that began in October 1982, work was resumed in the *porticus* on the lower terrace of the Temple of Zeus in Jerash in fall 2021. We are grateful that this was possible in spite of the ongoing coronavirus crisis.

When Jacques Seigne and his team of the Mission archéologique française de Jerash (MFAJ) discovered a bronze-casting pit outside the entrance of the northern hall of the *porticus* in 1993, it was already clear that this could only be a small part of a larger workshop. In the campaigns of 2012 and 2014, two more pits were excavated, one next to the first and the other directly inside the hallway. All of the pits were filled with fragments of bronze-casting molds and kilns. The molds seem to have been used for casting folds that were later welded to a bronze statue.

It has been presumed that the previous excavations had unearthed the boundary area of a 2nd-century CE Roman workshop where large-scale bronzes had been cast. A large part of the workshop is to be expected inside the *porticus* itself, using that closed yet well-ventilated space. To further investigate this possibility, a new project was initiated, located at KU Eichstätt-Ingolstadt and funded by the DFG (German Research Foundation). In fall 2021, a small square was opened inside the *porticus*, directly next to its entrance, where the French campaign of 2014 had unearthed what was then the last of the casting pits.



Although the main objective of the project was research on the bronze-casting workshop, it had also been planned from the beginning to document the later uses of the area as thoroughly as possible. Previous work of the MFAJ had already made clear that squatter houses would be found in this area. During our excavation, it turned out that the space next to the northern entrance of the lower terrace had been inhabited in two phases.

In the Umayyad period, the area was divided into a square room and an adjacent corridor that led to the northern entrance of the *porticus*. The room had a mud-brick floor with a stone substructure (Fig. 1). The corridor seems not to have been paved, as its floor level was a bit lower. Although the impromptu house was buried underneath collapsed blocks from the vault, there were no signs of a widespread fire. The inner faces of the stones are black from grime, but they also show traces of color that indicate a floral decoration (Fig. 2). Due to the remarkably small number of finds it is presumed that this part of the vault collapsed not directly during the earthquake of 749 CE but at a later time, leaving the inhabitants time to move out in an orderly fashion.



Fig. 2. Traces of color suggesting floral decoration. (Photo by Stefanie Becht.)

Underneath the Umayyad level there was a Byzantine wall running north-south (Fig. 3), forming one big room that could also be entered from the northern entrance of the terrace, with a doorstep in the center. The second wall of the room was not within the excavated area; it probably lay on the other side of an arch that led from the *porticus* to the terrace in Roman times and was later blocked, likely for the installation of the Byzantine room.

At this point we decided to go no deeper than the Byzantine floor, which seals off the Roman layers. Traces of the casting pit and the surrounding floor could already be seen in a trench. Hopefully the rest of the workshop can be studied in the next campaign in fall 2022.

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Fig. 3. Different phases of usage: the Byzantine wall is visible underneath the Umayyad walls. (Photo by Stefanie Becht.)

Khirbat al-Batrawy

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The seventeenth season (2021) of archaeological excavations and restorations at Khirbet al-Batrawy was devoted to the continuation of the exploration of the Early Bronze Age III monumental buildings discovered on the northern side of the *khirbat*. Along the northern fortifications (area B north), a special focus was devoted to the investigation of the main inner city wall (MIW) and the outer wall (W.155) at their easternmost stretch. Inside the fortifications, excavations continued in the area of the Early Bronze Age III “Palace of the Copper Axes” (area B south), expanding the explored area of this building to the southeast. Before reaching the room stratum, another portion of the multi-layered Early Bronze Age IVB village was also excavated.

Area B North: The Northeastern City Wall

In area B north, a further 5 m stretch of the MIW and the parallel outer wall were brought to light, with a thickness north-south of about 12 m (Fig. 1). These structures were uncovered after the removal of the huge collapse layer related to the final destruction of the EB III city (F.1552).

Batrawy’s multiple city walls represent a unique summary of the city history, from its foundation on the eve of the 4th millennium BCE to its first destruction due to a tremendous earthquake around 2700 BCE, the following reconstruction during EB IIIA, then another destruction and final fire that destroyed the city in about 2300 BCE.

Area B Southeast: The “Palace of the Copper Axes,” Room L.976, and Courtyard L.936.

Excavation in squares BpII9+Bp/BqII9+BpII9/10 brought to light room L.976 and the southern part of courtyard L.936, identifying the southern wall (W.989) of the eastern pavilion, which runs west-east (Fig. 2). The extension of the excavation area allowed the clarification of the plan of the palace toward the east, with wall W.1187 separating the eastern pavilion (specifically inner court L.1046) and courtyard L.936. The two spaces were linked by a door (L.992), found blocked, which was opened through wall W.1187.

Excavations in the 2021 season allowed us to complete the investigation of a room with access from above (L.976), located at the southeastern corner of court L.1046, which possibly hosted a staircase. The room is delimited by a semicircular wall (W.969) to the north and two walls oriented north-south (W.973 to the west, and W.983 to the east). In the southwestern corner of courtyard L.936, two floors were distinguished. The uppermost floor is designated L.980, with a related preparation (F.987) made of pebbles and smashed bricks. A squared block (B.985),





Fig. 1. General view of the Early Bronze Age III multiple fortifications (area B north) and the “Palace of the Copper Axes” (area B south), from the east. (Photo courtesy of Rome “La Sapienza” Expedition to Palestine and Jordan.)



Fig. 2. General view of room L.976 and courtyard L.936 at the end of the 2021 season of excavations, from the southwest. (Photo courtesy of Rome “La Sapienza” Expedition to Palestine and Jordan.)

measuring 0.39 x 0.41 m, was found 1.40 m north of wall W.989 and is interpreted as a pillar base. After the excavation of a 25 cm-thick layer of destruction (F.988), the lower floor was reached (L.990), which was composed of a thick whitish plaster applied to the bedrock to level the difference in elevations. The upper floor (L.980) lies at 657.49 m asl, and the lower floor (L.990) at 656.97 m asl.

Conclusions

The seventeenth season (2021) at Khirbet al-Batrawy contributed to a deeper and more detailed knowledge of this ancient city of Jordan, of its monumental defensive system, and its inner layout, as well as of its history, economy and social organization in the Early Bronze Age II-III.

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Wadi Shu'aib: Tell Bleibil

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The year 2020 marked an abrupt halt to research in the field for the Wadi Shu'aib Archaeological Survey Project (WSAS). This time gained was profitably used, however, to work on the material and data retrieved since the inception of the project in 2016 and to prepare this material for publication.

In the fall of 2021, after the pandemic-related break in excavations in 2020, we were finally able to carry out a field season again at Tell Bleibil, which is located in the southern Jordan Valley, at the southern end of the Wadi Shu'aib. Comprising an area of almost 50 m², several new test trenches were created on the northern flank of the tell, exposing part of an exceptionally well-preserved Iron Age IIC (7th–6th century BCE) casemate wall (termed “building A”), of which two rooms have been exposed so far. The structures can be architecturally and functionally assigned to belong to the massive stone foundations of the Iron Age fortification wall already exposed in the 2019 campaign on the northwestern flank of the tell (for these results, see Ahrens 2020). Of particular interest was the collapsed material filling found within room 1 of building A, which consisted entirely of the debris of a massive destruction context. The debris still had large portions of an intermediate floor or ceiling construction that had fallen into this room, allowing for a detailed reconstruction of the rising masonry. The standing walls of the rooms within the casemate wall are preserved up to a height of almost 1.5 m in parts, making this find context unique and exceptional (Figs. 1–2). The pottery assemblage found within the debris typologically dates to the Iron Age IIC period, notably with painted pottery fragments featuring red and black horizontal bands sometimes referred to as “Ammonite” additionally supporting the general date of the assemblage. A fragment of a deep, rounded carinated-rim bowl from outside the structure can possibly be interpreted as an emulation of Neo-Assyrian prototypes. The date of the destruction of the entire complex therefore seems very likely to fall within the timespan of the Neo-Assyrian or Neo-Babylonian periods. Given the results of the 2021 field season, Tell Bleibil appears to be a heavily fortified settlement belonging to the realm of the kingdom of Ammon in the Iron Age IIB/C period, clearly monitoring the southern Jordan Valley and the regions lying to the west, and at the same time guarding the entrance into the Wadi Shu'aib and ultimately the passage towards the Transjordanian Plateau with its capital, Rabbat Ammon.

Immediately above this building complex a part of a building dating to the last phase of the Iron Age (Persian period, ca. 5th–4th centuries BCE) was uncovered (termed “building B”). Here, several larger pithoi were found in situ;





Fig. 1. Room within the Iron Age casemate wall with destruction debris still visible in the southwestern section (building A, room 1), 7th–6th century BCE. (Photo by Alexander Ahrens, DAI.)

one of the vessels among this group also bears a short Aramaic inscription, which mentions the owner of the vessel. This part of the exposed building may thus tentatively be interpreted as a part of a storeroom.

In addition, the entire settlement mound was recorded by photogrammetry for the first time during the 2021 field campaign; the data generated were used not only to create a topographic plan of the tell but also to map recent disturbances. Excavations at the site are planned to continue in 2022.

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Fig. 2. Iron Age casemate rooms (building A), 7th-6th century BCE.
(Photo by Alexander Ahrens, DAI.)

Tall Hisban

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Fig. 1. Aerial photo of Tall Hisban in October 2021, view east. (Photo courtesy of Bob Bewley, Aerial Photographic Archive for Archaeology in the Middle East.)

The Islamic Archaeology Research Unit of the University of Bonn resumed excavations at Tall Hisban (Fig. 1) for a three-week season in October 2021, directed by the author and funded by the Gerda Henkel and Max van Berchem Foundations and the University of Bonn. The international team of twenty included PhD students from Bonn; specialists and technicians from Jordan, Germany, Belgium, and the U.S.; and eleven workmen from Hisban, trained by the Jordanian NGO AIRaqeem. In preparation for final publications on the Islamic strata, the 2021 season was designed to address specific questions related to occupational history. These included the timing and circumstances behind the rapid resettlement of ruins largely abandoned since the late Abbasid period and dating the initial construction of the farmhouse clusters at the base of the tall. Foundation levels were reached in two fields this season, confirming the early 13th-century reoccupation of Byzantine ruins across the site. Some buildings were preserved for as many as ten courses, measuring 3.5 meters from the bedrock foundations to the stone vault springers.

Excavation and photogrammetry of a complex of four conjoining vaulted structures at the southwest base of the tall (field O) were completed this season, with important results. The discovery of a *tannur* house (Fig. 2), complementing the recovery of a complete subterranean cookpot excavated in 2018, has led to its tentative identification as





Fig. 2. *Tannur* room in square O9. (Photo courtesy of Sherihan Inalo, University of Bonn.)



Fig. 3. Vaulted structure of S1, on bedrock. (Photo courtesy of Sherihan Inalo, University of Bonn.)

a public kitchen dating to the 13th century. As part of our larger study of medieval Islamic kitchen culture, extensive sampling of soils continued this season. Botanical remains will be processed for macrobotanical, phytolith, and starch analysis in Germany and the U.S. in 2022. A wide range of glazed imports from the 13th century was recovered from reoccupation levels in all structures in this field.

A vaulted structure with a partially preserved vault (Fig. 3) on the upper west slope (S1)—uncovered by looters during the pandemic—yielded a rich variety of late-Mamluk table wares, storage and cooking vessels, and household metal implements. As a whole, the ceramic corpus produced a wider range of handmade forms and imported glazed wares of this period than is normally found at any single site in Jordan. This structure was excavated in its entirety to bedrock.

Excavations in the North Church focused on the intrusive medieval burials. Five cist graves laid outside the south aisle of the Byzantine church were targeted, to investigate who may have resettled Hisban in the middle Islamic period. Initial osteological study documented the gender and age of the individuals buried there. A late Ayyubid coin found in soil immediately covering one grave provided evidence for an early 13th-century use of the cemetery, which, along with the associated pottery, suggests that this was the communal cemetery of Ayyubid and Mamluk Hisban. Isotope and histological analysis of the skeletal remains is planned in 2022, in support of our larger study of human migration and health.

The industrial and economic importance of the site also came into greater focus this season. More evidence of local ceramic production emerged with the recovery of a ceramic mold, a stone potter's wheel, and finishing tools from Mamluk levels of three vaulted structures. Ongoing mineralogical and chemical analyses of pottery in Bonn is demonstrating the extent of local production of diverse wares. The discovery of small stone weights and a copper scale attests to the presence of a market at Hisban in the same period.

To complete a comprehensive site plan, and to document changes in urban structure over time, photogrammetry was combined this season with ground-penetrating radar.

Tall el-Hammam

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From January to March 2020, on Tall el-Hammam's upper city acropolis (fields UA and UB), the fifteenth season of excavations exposed and clarified Iron Age Ila-b, Late Bronze Age II, and Middle Bronze Age II architecture in twelve excavation squares.

Iron Age II (Strata VII-X)

On the upper tall's southwest extremity (field UA), in square 2BB, the well-preserved (and plastered) mud-brick superstructure (12–20 courses high, 2 m thick) of a monumental tower (with interior “empty space” dimensions of 4.10 m x 7.3 m) was discovered sitting on 3 m-thick dry-laid stone foundations about 3 m deep. The interior faces of all the stone foundations were also heavily plastered, forming a “basement” space below grade. It was built in association with the “governor's residence,” which abuts a substantial twelve-room warehouse to the northeast (which has an identically constructed stone foundation and mud-brick superstructure)—all enclosed by the final version of the Iron Age Ila city wall. The large stone foundations and associated engineered fill created a high-profile platform for both multistoried monumental buildings. Beneath the Iron Age Ila tower foundations, three additional Iron Age architectural phases were identified, the earliest being a large Iron Age Ila stone-lined silo. Additional early Iron Age Ila (stratum X) stone-lined silos and stone wall foundations were found across fields UA and UB, including 10 m-long W503, which served as an exterior boundary for a series of rooms. Short-life (barley) samples found in the destruction level of the “governor's residence,” warehouse, other administrative and domestic structures, and the city wall and gate complex of stratum VIII date the site's final Iron Age II destruction to the last third of the 9th century BCE. The authors attribute this destruction to Aramaean military action.

Late Bronze Age II (Stratum XI)

Additional architectural elements of a single, short-lived, freestanding, multiroom, one-story, 10 m x 10 m structure dating to the 14th century BCE (based on date ranges and ceramics)—built after three centuries of abandonment—were excavated. Presumption of a “customs house” controlling and taxing traffic on roads intersecting at the site is based on previously found objects, including pieces of carbonized furniture, a set of bronze balance-scale pans, weights, amulets, numerous painted pottery vessels, and sherds typical of the Late Bronze II ceramic repertoire. Large timbers and heavier-than-domestic construction suggest an “official” government function, presumably during Egypt's domination of the southern Levant (late 15th–14th



centuries BCE) and destroyed by fire in the late 14th century BCE. This season, fragmentary walls and a main double-doored entry to this building were found directly on remains of the northeast exterior wall of the Middle Bronze II palace complex.

Middle Bronze Age (Strata XIIA, XIIB, XIIIC [MB2]; XIII [MB1])

In square UB.5II, a section of the upper city's brick-on-stone wall foundation (W559) emerged with an exterior-offset defensive tower (with interior stairway) that had likely been added later—all atop an underlying defensive rampart constructed almost entirely of mud bricks, its glacis forming field UB's northwest-facing slope (Fig. 1). Immediately inside this wall/tower, a ring road separated the upper city defenses from parallel 2.2 m-thick stone-and-mudbrick W522. W522 forms a corner with W493, both having mud bricks with the same dimensions (averaging 40 x 40 x 12 cm). W493 represents the palace's northeast exterior wall, and W522 its northwest wall. In square UA.6HH, W522 ended, creating a possible 2.2 m-wide entryway. Opposite the southwest end of W522, W527 formed the other side of a passageway from the ring road into the palace—with evidence of an earlier mud-plaster and later lime-plaster floor a few centimeters above. In square UA.2BB on the upper tall's southwest edge, the southwest (exterior) face of a wide brick-on-stone-foundation wall was found with the same orientation and on the same level as W493 (the palace's northeast exterior wall). With the mud bricks of both being the same size (and having dimensions larger than those of the interior mud-brick walls), this wall is almost certainly the palace's southwest exterior wall, given its proximity to the southwest slope of the upper tall.

Project website: tallelhammam.com

Fig. 1. Middle Bronze Age II upper city wall and tower. (Photo courtesy of the Tall el-Hamman Excavation Project.)



Amman Citadel Project

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Fig. 1. General view of the project area. (Photo from the USAID SCHEP collection, American Center of Research Digital Archive.)

Amman is considered to be a top tourism destination in Jordan, with a rich cultural heritage legacy that extends from the Neolithic Period to modern times. The city's distinctive Amman Citadel Mount (Fig. 1), home to the birth of the Kingdom of Ammon during the Iron Age, continued to be a strategic location during the Roman, Byzantine, and Islamic periods. As part of the national vision to develop Amman's historic area, and focusing on enhancing visitors' mobility and access to the many attractions the city includes, the new Amman Citadel Project was launched to develop the southern slope of the site (Fig. 2). It also revives the original Roman staircase that once connected the upper city with the lower city via the southern gate of the Citadel (Fig. 3). This project was launched through a partnership between the Ministry of Tourism and Antiquities of Jordan, the Department of Antiquities of Jordan, and the American Center of Research's USAID-funded Sustainable Cultural Heritage Through Engagement of Local Communities Project (SCHEP), as well as the Greater Municipality of Amman.

The project will also preserve and restore heritage houses from a distinct historical period of Amman, 1870 to 1950. The project will focus on enriching the experience of visitors, who will be able to walk the staircases and pathways



AIJ 3
Amman Citadel Project



Fig. 2. Aerial photo of the Amman Citadel's southern foothill and the Byzantine complex. (Photo from the USAID SCHEP collection, American Center of Research Digital Archive.)



Fig. 3. The Amman Citadel's southern gate that connects the site with downtown Amman. (Photo from the USAID SCHEP collection, American Center of Research Digital Archive.)

AIJ 3

Amman Citadel Project

of old and modern Amman from the Amman Citadel to downtown to explore the Roman Theater, Nymphaeum, and Al Hussein Mosque within the city center of Amman (and vice versa). This revival project will have a great impact on the socioeconomic development of the community around the site and the people of Amman in general. The new tourism trail will show the city of Amman as an authentic Jordanian historical city with great aesthetic, artistic, and architectural values.

The works described above are made possible by the generous support of the American people through the United States Agency for International Development (USAID). The contents are the responsibility of ACOR and do not necessarily reflect the views of USAID or the United States Government.

Amman Roman Baths Rescue Excavations

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Fig. 1. The burning chambers, part of the hypocaust system. (Photo by Asem Asfour.)

While the Greater Amman Municipality was implementing a project to establish a rainwater drainage system to reduce the risk of flooding in the Amman downtown area (on Al-Hashemi street from the beginning of the Hashemite Square to the Al-Husseini Mosque), the work uncovered significant archaeological remains. The initial intent was to construct a reinforced concrete culvert, but work was stopped when architectural elements, such as bricks and ashlar blocks, appeared. The area was then inspected and evaluated by the Amman Antiquities Directorate of the Department of Antiquities. The result was an agreement to carry out a salvage archaeological excavation to verify the archaeological remains.

Excavations began on September 12, 2020, and ended on January 15, 2021. The excavation was carried out by the Amman Antiquities Directorate, and the initial results revealed the remains of burning chambers (boilers), which were built of bricks/refractory bricks. These chambers were used to heat water and represent the lower part of a Roman public bath, consisting of a group of burning chambers with a length of 20 m and a width of 11 m (Fig. 1). There are thirteen of these chambers on the northern façade, twelve in the southern façade, and eight on the western façade, while the those on the eastern side were too damaged by





Fig. 2. Top plan view of the Roman bath. (Photo by Asem Asfour.)

bulldozing to properly interpret. The burning chambers are about 1.75 m in height, and their widths range between 43 cm and 55 cm. Excavations also revealed the ignition chamber and the main burner of the bath room (with a length of 6.35 m, a width of 55 cm and a height of 1.45 m), in addition to the gates that were used to supply these burning chambers with the materials needed for ignition and burning and to remove the remains of the fuel.

The work also revealed rectangular pottery pipes sticking to the walls of the bath room from the inside; these pipes worked as a smoke evacuation system and supplied the burning rooms with oxygen. The excavations revealed some internal walls related to the rooms of the Roman bath; the height of the walls from the floor of the furnace to the level of the modern asphalt street was 4 m (Fig. 2).

Excavations were also carried out in a part of the work area that was not subjected to bulldozing, as the asphalt layer of the public street was removed. The results of the excavation in this area revealed a number of walls dating back to the Umayyad period, in addition to pottery bricks and a white plaster floor installed over the ceiling. These excavations revealed a group of ceramic lamps, coins, and an incense burner, most of which dated to the Umayyad period. Ceramic fragments of Roman, Byzantine, Umayyad, Fatimid, Abbasid, and Ottoman periods were also found, in addition to marble fragments and metal remains that were used to install marble slabs on the stone walls.

The results of the excavations showed that a number of burning chambers in the Roman bath had been destroyed during the Byzantine period and that the building was reused during the Umayyad period, although its function was changed to residential purposes (i.e., not used as a bath). The discovery of this bath has contributed an integral part of the plan of the Roman city of Philadelphia that now joins other archaeological remains such as the Roman theater, the Nymphaeum, and features of the Citadel.

Amman: Khirbet Salameh

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Overlooking a fertile valley in antiquity, the site known as Khirbet Salameh (Fig. 1) was an agricultural settlement founded by no later than the 3rd century BCE, during the Hellenistic period. The current building is a unique example of preserved rural architecture in the Amman area, dating to the Roman period (2nd century CE) and still functioning or reused during the Byzantine and early Islamic periods. The site was partially excavated and documented in the 1970s and 1980s, then utilized in the 1990s as a field school site with the University of Jordan by Pierre Bikai, director emeritus of the American Center of Oriental Research (now the American Center of Research). The fortified square main structure is primarily built of limestone and measures 24 by 24 meters. The main gate faces east, where the water and fertile agricultural lands were most accessible. The building includes fourteen rooms around an inner courtyard. The site adjoins the American Center's property.

Cultural heritage valorization efforts stressed site protection in advance of any site presentation. Based on this approach, basic protection efforts were undertaken at Khirbet Salameh in 2020, and more comprehensive work began in January 2021. All efforts were in collaboration and by joint agreement with the Department of Antiquities. Prior to interventions, aerial documentation of the site by drone was carried out by Qutaiba Dassouqi. Thereafter, the first phase, led by John D. M. (Jack) Green, consisted of site cleaning, buttressing fragile areas, covering deep holes, and recording/visualizing the site in its current condition. The second phase included building a stone wall along the eastern exposed cliffside to protect it from geological instability, along with a proper staircase with handrails to protect visitors, a joint effort overseen by Ala'a Al Badarin and Jehad Haron and supported by the American Center's USAID-funded Sustainable Cultural Heritage Through Engagement of Local Communities Project (SCHEP). The third stage focused on urgent and minimal intervention inside the archaeological site, to further stabilize the open holes and install metal covers on the wells and the pit silos, in addition to adding a lighting system. Protecting the landscape was part of the third phase through the planting of trees around the perimeter, in line with the standards of demarking and preserving the archaeological site from potential encroachment (Fig. 1).

The representation and interpretation of this site is an exciting opportunity within urban Amman, an area under daily development, which presents a threat to such historic agricultural settlements in such spaces. Accordingly, starting in late 2021, augmented-reality and virtual tours were created by Hussam Ababneh, to allow different societal groups to interact with the site and better understand the





Fig. 1. Khirbet Salameh after interventions. (Photo by AbedalFatah Ghareeb.)



Fig. 2. Three-D model of Khirbet Salameh created by Hussam Ababneh. (Image courtesy of the USAID Sustainable Cultural Heritage Through Engagement of Local Communities Project, American Center of Research.)

historical content of the site (Fig. 2). The augmented-reality application usable at the site can be downloaded from the Google Play store or Apple App Store.

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Amman: Abdoun Community Archaeology Project

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In 2021, the American Center of Research and the Jordanian Department of Antiquities partnered to create a new community archaeology program: the Abdoun Community Archaeology Project. As described elsewhere (Al Badarin et al. 2021), the project serves as a place to deepen the involvement of members of the public with the rich history and heritage of the area. That is, it provides an opportunity for people to “get their hands dirty.” Under the close supervision of trained professionals, volunteers will be welcomed to help understand and excavate the Abdoun South site. With a focus on ensuring that those who live around such sites have an appreciation for historical structures and the past, the goal is simply to see more people informed and involved.

The Abdoun South site is located in the heart of one of the busiest parts of Amman, especially notable for the presence of diplomatic missions and expatriates from all over the world. The site, which is currently fenced in, is east of the Japanese Garden, a public park opened in 2010. As we understand the site today, it comprises multiple buildings constructed with large limestone blocks, but no wholistic documentation exists. In 2021, the site was recorded as it stands today. Still, the site needs excavation and further documentation in order to identify its function. The history of the site is believed to date at least as far back as the Ammonite era, specifically to the Iron Age II, but it was reused during the Roman and Ayyubid-Mamluk periods.

In December 2021 we conducted the first season at the site. The work focused mainly on-site cleaning and removal of recent rubbish. In addition, survey and documentation activities commenced, during which the survey grid was installed and all the features at the site were documented using GIS and photogrammetry, in preparation for opening to general excavation in 2022.

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Fig. 1. Top-plan orthophoto of the Abdoun site, 2021. (Photo by Ehab Al Jariri, courtesy of the American Center of Research.)

Qasr al-Mshatta

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Fig. 1. Restoration works at the throne hall. (Photo courtesy of the Tarmeem Center for the Preservation of Heritage, 2021.)

Inscribed on the World Heritage Tentative list, the Qasr al-Mshatta archaeological site is one of the most important and largest Umayyad palaces in Jordan. Dating to 743 CE, it was constructed by Walid II in the desert some 30 km south of Amman. The early death of Walid in 744 CE may have suspended building activities, which is why it is considered today to be an unfinished monument. It is believed that before 800 CE a major earthquake destroyed the palace, which then remained abandoned for several centuries. It was only in the late 19th century, in connection with the construction of the Bagdad and Hejaz railways, that travelers again took notice of this richly decorated palace. In 1903 the Ottoman sultan Abdul Hamid II donated two thirds of the richly decorated main gate to the German emperor Wilhelm II so that it could be included in the newly built Pergamon Museum in Berlin. Since then, the façade has become one of the highlights of the Museum of Islamic Arts in Germany.

The Tarmeem Center for the Preservation of Heritage, a nonprofit organization, is implementing a new conservation project for Qasr al-Mshatta, funded by the U.S. Ambassador's Fund for Cultural Preservation (AFCP), in cooperation with the Department of Antiquities. The project was launched in 2019 and will contribute to the full preservation, restoration, and management of Qasr al-Mshatta and will enhance its role in socioeconomic development through sustainable





Fig. 2. Consolidation works for the rooms. (Photo courtesy of the Tarmeem Center for the Preservation of Heritage, 2021.)

tourism. During its first phase, the project accomplished significant interventions at the site, including restoration of the throne hall, conservation and rehabilitation of the eastern façade, solving some of the hydrological problems in the palace, and performing other major works in the restoration of vaults and walls with cracks. This has been achieved through training and engaging more than twenty-three participants from the local communities from six nearby villages, which was key to the success of the project. The project will enhance the interpretation and presentation of the site for the visitors using advanced augmented reality and by connecting the site with Queen Alia International Airport.



Fig. 3. Clearance works of the northern walls. (Photo courtesy of the Tarmeem Center for the Preservation of Heritage, 2021.)

Khirbat al-Mukhayyat: The Town of Nebo Archaeological Project

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The town of Nebo (also called Khirbat al-Mukhayyat) is located at the western edge of the Madaba plateau, overlooking the Dead Sea and the Jordan Valley. The Town of Nebo Archaeological Project (TNAP) has conducted four seasons of excavation, which have succeeded in exposing portions of the Iron Age (9th/8th century BCE) defensive system and evidence of Hellenistic-period (3rd–1st centuries BCE) ritual activity. Due to the global pandemic, TNAP has not been able to conduct any fieldwork since 2019. We have, however, taken advantage of these circumstances to work on material on loan from the Department of Antiquities and make progress on the publication of certain legacy collections.

A topographical and surface collection survey was conducted at Mukhayyat in 2000/2001 under the auspices of the Tell Madaba Archaeological Project (TMAP). This survey contributed to TMAP's research objective of examining the relationship between an urban center (Madaba) and surrounding satellite communities (e.g., Mukhayyat). Although preliminary analysis had been conducted on the collected data, systematic examination had yet to be undertaken. In 2014, the ceramic material was transferred to Wilfrid Laurier University (Waterloo, Ontario, Canada), and student staff and volunteers began drawing and recording individual sherds. By 2020, all sherds had been drawn and all drawings digitized.

At this time, a former Laurier archaeology student, Grant Ginson, began analyzing the topographic data and producing various maps (Fig. 1) that could inform future excavation strategies. This prompted our research team to present a poster, entitled "Four Millennia in Three Dimensions: Digital Media at Khirbat al-Mukhayyat," at the 2020 American Society of Overseas Research (ASOR) virtual meeting. In preparing this poster, we recognized the need to prepare the material from the 2000/2001 survey for publication. In addition, we realized that newfound virtual meeting platforms, made essential by the pandemic, were ideal for collaborative work by a research team spread out across North America and Europe. We established a schedule of monthly meetings and set up shared folders and documents that we could all contribute to and edit.

We began by sorting all of the pottery drawings by time period and then by vessel form. This required the collection of additional information for some sherds. Fortunately, a senior Laurier archaeology student, Christine Sylvester, was awarded an ASOR Summer Stipend. This allowed her to assist me in the lab (Fig. 2). Our research team has now assembled representative forms for each time period and associated parallels. We are also completing the text and graphics for an article that will soon be submitted for



AJ 3
Khirbat al-Mukhayyat

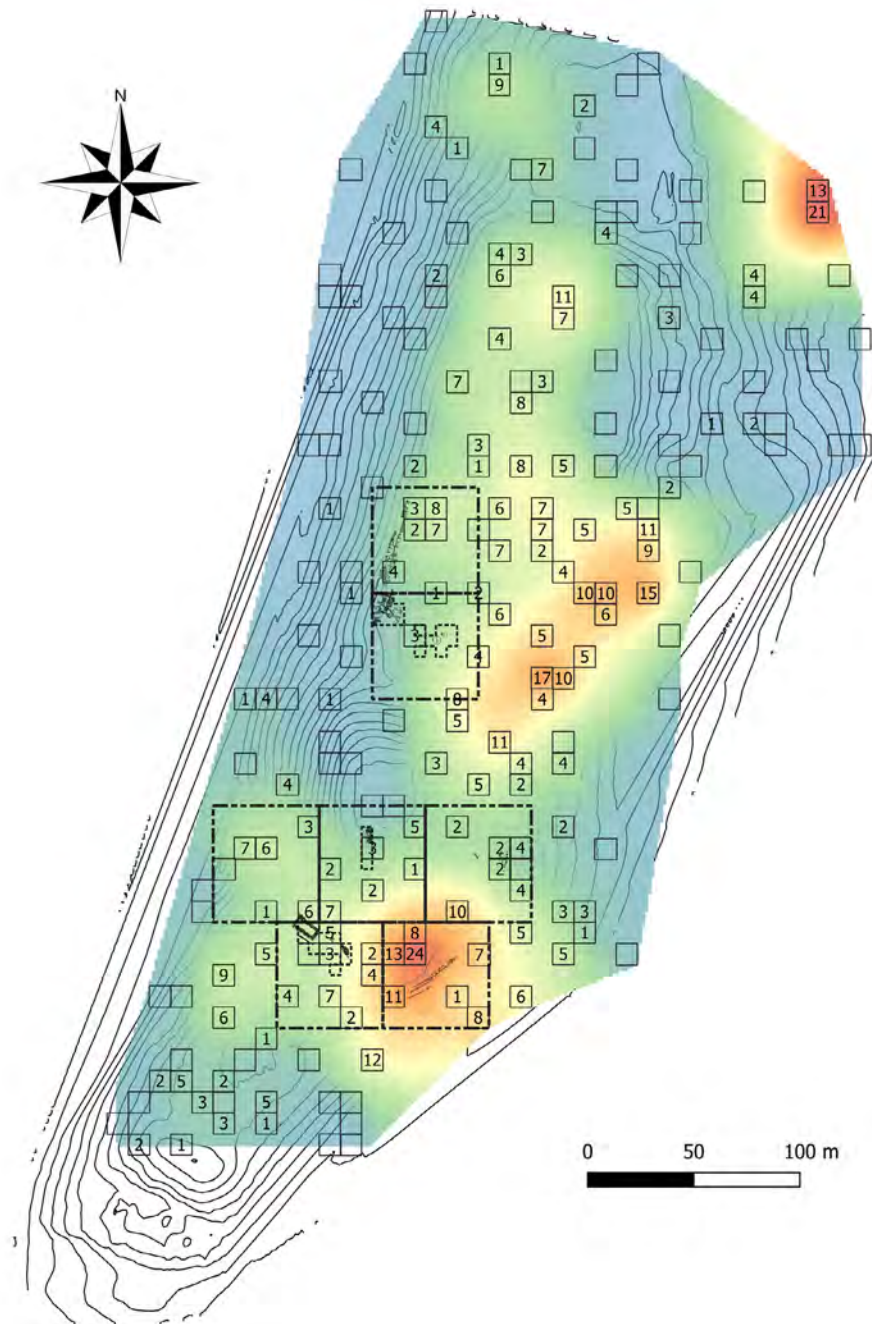


Fig. 1. Map showing distribution of Hellenistic sherds. (Prepared by Grant Ginson.)

publication. In addition to informing us on where to excavate next, this work has allowed us to see the breadth of cultural periods at Mukhayyat. It has also forced us to think about the effects of previous excavations and earth-moving activities on the depositional history at the site. Although the COVID-19 pandemic has caused a massive disruption to our research, it has demonstrated to us the importance of returning to legacy collections.

TNAP's work over the past two years, albeit completely unplanned, has contributed greatly to the evolution of our collaborative project. I am indebted to my research team: Gregory Braun, Andrew Danielson, Věra Doležálková, Grant Ginson, Stanley Klassen, and Christine Sylvester. Their collegiality and enthusiasm have helped turn this difficult time into a period of productivity. We are all looking forward to returning for a fifth excavation season in the summer of 2023 when we will, hopefully, be able to answer some of the lingering questions that our excavations have produced. For more information on TNAP, please visit our website.

Project website: townofneboproject.com/



Fig. 2. Debra Foran and Christine Sylvester in the Near Eastern Lab at Laurier University. (Photo by Debra Foran.)

The Madaba Regional Archaeological Museum Project

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Officially initiated in 2015, the Madaba Regional Archaeological Museum Project (MRAMP), a joint American-Italian-Jordanian endeavor to establish a new regional archaeological museum in historic downtown Madaba, accomplished several of its objectives in 2020–2021, in spite of the ravages of the COVID-19 pandemic. Conceived in “community archaeology,” the MRAMP program sets out to 1) preserve cultural heritage; 2) add value to Jordan’s legacy; 3) develop the link between heritage and the economy through increased tourism; 4) ensure sustainability; and 5) guarantee community engagement at numerous levels.

The MRAMP project enjoys several avenues of support, particularly USAID (through SCHEP, the Sustainable Cultural Heritage Through Engagement of Local Communities Project, implemented by the American Center of Research), the Ambassador’s Fund for Cultural Preservation/Cultural Antiquities Task Force (funded by the U.S. Department of State), the Ministry of Foreign Affairs and International Cooperation of Italy, and other international resources, both monetary and in kind.

This report focuses on 1) MRAMP activities accomplished remotely or in hybrid fashion; 2) MRAMP activities performed on-site in Madaba; and 3) future objectives.

Because COVID-19 prevented in-person engagement through 2020 and much of 2021, MRAMP navigated a significant shift from on-site to primarily online venues and activities. Necessitated by the pandemic, this pivot propelled MRAMP into extremely promising territory to advance the project and its effectiveness. Three major workshop series, two with accompanying manuals, were launched during this period which saw in-person sessions connected to local and non-local specialists via interactive media technology. These included Artifact Handling (a hybrid workshop and published manual in Arabic and English); the Pottery of Jordan (three hybrid workshop sessions and a manual [in press], also in Arabic and English) (Fig. 1); and several more workshops focused on artifact curation, conservation, and restoration.

Development of online resources took a major step forward with the production of several digital platforms that address cultural heritage preservation. Funded by the U.S. Department of State and enabled by CyArk.org, local university students and faculty were trained in photogrammetry to capture three locations in Madaba, local tour guides were engaged for these locations, and local storytellers reflected on growing up among archaeological ruins. This led to the production of the interactive virtual tour (in Arabic and English): “One Place, Many Stories: Madaba, Jordan” (cyark.org/projects/madaba/Guided-Tours). In addition, there now exists a five-minute,





Fig. 1. Pottery of Jordan training workshop at the Madaba Institute of Mosaic and Art Restoration. (Photo by Douglas Clark.)

three-D video tour of the proposed new museum (madabamuseum.org/en/page/44/THE-BUILDING). The MRAMP website (in Arabic and English) continues to see enhancements as well.

Also accomplished, for the most part remotely, was a remarkable transformation that took place as the current Madaba museum was repurposed into a well-organized and smooth-running storage, research, and display venue (Fig. 2), following best practices, carried out by the local Department of Antiquities/MRAMP team of specialists and directed by Drs. Fatma Marii and John (Jack) D. M. Green. Periodic training sessions helped to build the team's capacity and to preserve, physically and digitally, the thousands of artifacts in the collection. U.S. Ambassador's Grant reviewers recommended the Madaba facility as a model for other museums in Jordan.

On-site accomplishments included ongoing maintenance and the installation of interpretive signs in the Madaba Archaeological Park West (II), site of the proposed new museum. More consequential to the success of the project was continued development of local stakeholder groups, in particular the MRAMP Advisory Council, an informal committee made up of a wide cross-section of representatives from local, regional, national, and international stakeholder groups. Outcomes of these meetings have a direct impact on enthusiasm and support for the new museum.

AIJ 3

Madaba Regional Archaeological Museum Project

Future objectives include removal of a 20th-century cinderblock building, a final excavation season beneath that building, an interactive virtual tour of the proposed museum, renovation of the entry hall and an early 20th-century clinic (Introductory/Timeline Hall), fulfillment of regulations governing new construction, continued website development, fundraising, and construction.

Project website (Arabic): madabamuseum.org/ar
Project website (English): madabamuseum.org/en

The works described above are made possible by the generous support of the American people through the United States Agency for International Development (USAID). The contents are the responsibility of ACOR and do not necessarily reflect the views of USAID or the United States Government.



Fig. 2. Current Madaba museum, repurposed for storage. (Photo by Fatma Marii.)

Tall al-Mashhad

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The persistence of the COVID-19 pandemic denied the possibility of carrying out archaeological activities in the field almost everywhere. It has, however, favored the possibility of completing previously slow documentation and publication activities. Therefore, the Tell al-Mashhad Project staff started planning the publication of data and materials that emerged in the five campaigns carried out between 1999 and 2011 at Tall al-Mashhad, at the foot of Mount Nebo, near the perennial springs of ‘Ayun Musa (Fig. 1). Archaeological research there has concentrated on the remains of two buildings, namely building B (a series of domestic structures south of the modern road, excavated in 1999 and 2000) and building A (a large, square edifice located on the top of the hill, dominating the springs and the wadi); here, after a preliminary mission in 2003, archaeological activities were carried out between 2010 and 2011, amid great difficulties due to the presence of extremely invasive clandestine excavations.

Initially, we envisaged publishing the excavation results as a single volume, including all aspects of all activities carried out, but the abundance of data that emerged encouraged the editors to plan the drafting and printing of three volumes. The first book in the series, the subject of which is the pottery from the excavation, was published in May 2021 (Benedettucci 2021) thanks to the kind availability of the Aracne publishing company (Rome) and Prof. Claudio Saporetti, who strongly desired this book to be included in the series he directs. The following volumes will instead be issued by the publisher Espera, also in Rome, which accepted our proposal to create a new series of archaeological studies. The first, mainly dedicated to the results of the excavation, is almost complete as of March 2022 and is expected to come to light in the summer of 2022. The other volume, a collection of studies on the archaeological and historical data by Italian and foreign specialists, is expected between the end of 2022 and the early months of 2023.

A further important aspect linked to the mission’s activities is the project of a traveling exhibition on the results of the excavation, in which explanatory panels and scale reproductions of the most important buildings on the site will be exhibited. The first exhibition will be held in Rome, in a location yet to be established, and that will be followed by further stops in other Italian cities.

Alongside these activities, the staff was also involved in the continuous updating of the Archaeology of Jordan website (archaeologyofjordan.mystrikingly.com), a freely available collection of thousands of links on archaeology of the Transjordanian region.





Fig. 1. General view of Tell al-Mashhad from the springs of 'Ayun Musa. (Photo by Francesco M. Benedettucci, Archaeological Mission at Tell al-Mashhad.)

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The third season of excavations at Khirbat Safra, directed by Paul Gregor and Paul Ray of Andrews University, took place between May 30–July 9, 2021. Khirbat Safra is a ca. 2.6-acre site overlooking the Dead Sea. A casemate wall system surrounds the perimeter; its freestanding walls are built directly on bedrock, and the crevices were leveled with a densely packed, bricky material. The initial construction of the wall system dates to Early Iron Age I. This season excavations took place in four fields (B–E).

Excavations in field B, on the southwest side of the site, have concentrated on tracing two buildings with a shared wall, consisting of long-room structures and broad-room casemates, with their entrances on the north side. These structures are uneven, having been built over three bedrock terraces. The removal of a baulk in building 1 this season helped to clarify the nature of northernmost of these terraces. In building 2, which is a typical “three-room house,” the removal of baulks exposed additional architecture; the western long room had been subdivided into three smaller units.

Excavation of a third building began this season. Its eastern wall is freestanding, not shared with its neighbor (building 1). The western wall, visible above the current surface, is outside of the square and awaits future excavation. The northern wall is cut by its entrance, but unlike buildings 1 and 2, it is in the middle, rather than in the corner. As in building 2, the long room is subdivided, but its partition wall is placed on an oblique angle, making the structure somewhat narrower than the others excavated so far. The reason for the deviation from the pattern of the other buildings would seem to be the truncation of the triangular-shaped topography at this point on the site. As in the other buildings, there is a beaten-earth surface, just above bedrock.

In field C, on the northeastern corner of the site, excavation has focused on two structures incorporated into the fortification system, similar to those in field B. Operations this season concentrated on exposing parts of building 2. In addition to its broad-room casemate, building 2 is subdivided by a short wall and two pillars into two long rooms. The southern long room was further subdivided to create two rooms in a second phase. The northern long room was likely an unroofed courtyard; a *tabun* and cooking area support this hypothesis. Two use layers were discovered, the first dating to Early Iron Age I, the later to the Early Iron Age II. The earlier floor was covered with a thick ash layer that is sealed under the second occupational floor. Above this surface, wall tumble and fill indicate destruction, possibly by an earthquake. North of building 2 are a few surviving walls, remnants of bulldozed “building 3.”



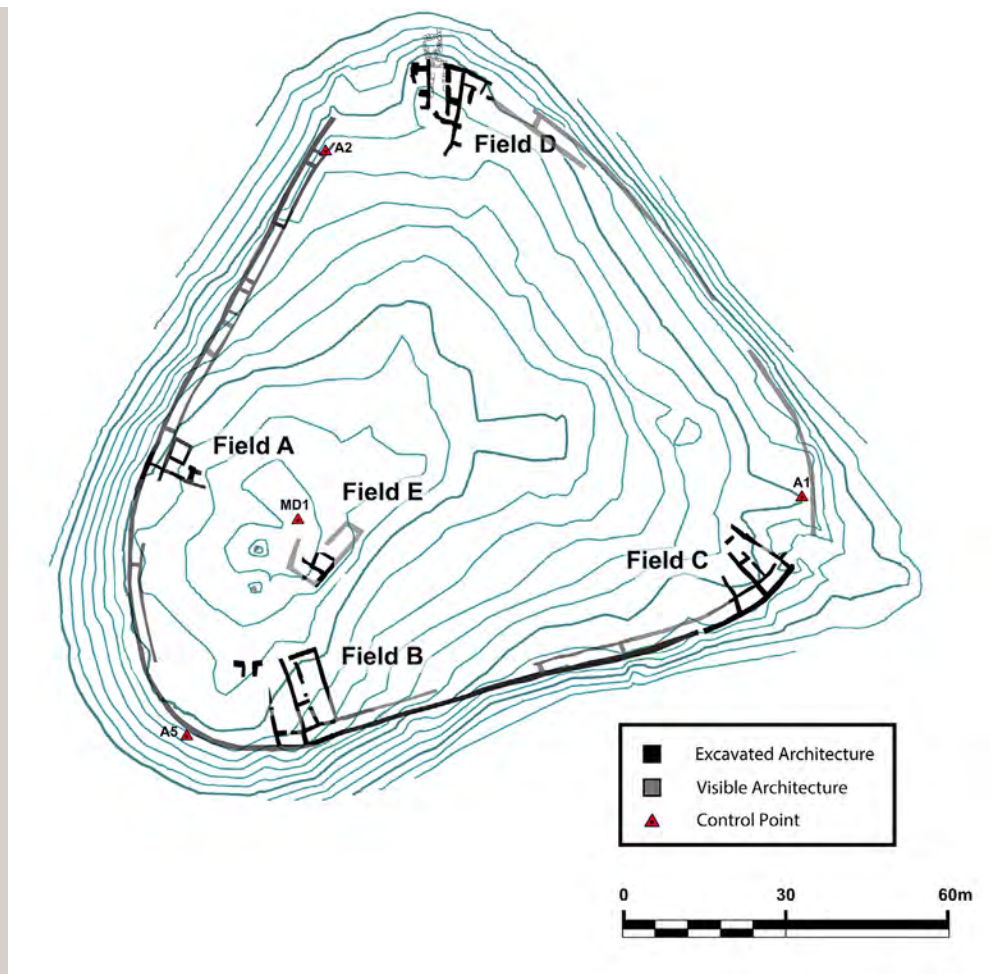


Fig. 1. Khirbat Safra topographical map, 2021. (Map by Bob Bates; modified from Department of Antiquities survey, 2017.)

In 2019, part of a gateway complex was found in field D, on the northern edge of site. Additional exposure in 2021 showed a southern extension of the western gate chamber: two ephemeral walls and a “threshold,” possibly remnants of an outer gate chamber.

Field E, located at the highest point of the site, was opened this season, and part of a building with three Iron Age I phases was excavated. Its earliest phase contained a long room with extant walls on three sides. Several artifacts were found on its floor. It was subdivided into two rooms during a second phase. In the last phase, a doorway was built on top of the dividing wall, with raised floors on either side. Several Egyptian-style artifacts were found in this building, including a scarab, cosmetic rod, and mace head.

Machaerus

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There is a narrative account of the Gospels that has a consistent and complementary confirmation from a 1st-century historian outside the Bible: the imprisonment and beheading of Saint John the Baptist. This is the only Gospel passage for which we have a parallel narrative in a non-Christian work of the same era. The aforementioned textual reference is founded on the testimony of Flavius Josephus, the Romanophilic Jewish historian of the imperial Flavian dynasty, in Rome: “John, that was called the Baptist: for Herod slew him [...] he was sent a prisoner, out of Herod’s suspicious temper to Machaerus castle, and was there put to death” (*Antiquitates Judaicae* 18.5, 2).

The historical data of the *Antiquitates* on John’s arrest and jail by Tetrarch Herod Antipas are attested by all the Gospels, and their accounts are consistent with and complement that of Josephus. The authenticity of this textual evidence, as a genuine historical reference, was confirmed by Eusebius Pamphili, the bishop of Caesarea Maritima, in ca. 324 CE: “John called the Baptist [...] of Herod’s suspicion John was sent in bonds to the citadel of Machaerus, and there slain” (*Historia Ecclesiastica* 1.11, 4–6).

From the beginning there was a very serious holy tradition concerning Machaerus in Christianity, even though the historical city was destroyed by the Romans and had disappeared from the maps already by the end of the 1st century. Still, Machaerus was always commemorated as the historical place of the Golgotha (or Calvary) of Saint John the Baptist, including in the pertinent *eulogium* in the *Martyrologium Romanum* for the memorial day of Saint John the Baptist’s persecution, 29 August: “*Memoria passionis sancti Iohannis Baptistae, quem Herodes Antipas rex in arce Macherontis in carcere tenuit et in anniversario suo, filia Herodiadis rogante, decollari praecepit.*”

However, there is another unique character of the historical place of the Calvary of the Baptist: its genuine Gospel setting survived the last two millennia as a time capsule. After the destruction of Machaerus by the same *Legio X Fretensis* of the Roman army that had destroyed Jerusalem approximately a year earlier, the ancient city was completely abandoned, its ruins buried under the accumulated wall-destructions of the ancient buildings, and Mount Machaerus was never inhabited again.

The archaeological excavations on the site have been in progress since 2009, on behalf of the Hungarian Academy of Arts and the Jordanian Department of Antiquities, in close scientific collaboration with three academic institutions: the Jerusalem Studium Biblicum Franciscanum, the École biblique et archéologique française de Jérusalem, and the Cobb Institute of Archaeology at Mississippi State University. The archaeological legacy is perfectly





Fig. 1. In the Vatican, the author (center) receiving the Pontifical Gold Medal and the Diploma of Pope Francis from Cardinal Gianfranco Ravasi, president of the Pontifical Commission for Sacred Archaeology (left), and the Secretary of State of His Holiness, Cardinal Pietro Parolin (right). (Photo copyright and courtesy of the Papal Household, Vatican City.)



Fig. 2. The Pontifical Gold Medal of His Holiness Pope Francis. (Photo copyright and courtesy of the Papal Household, Vatican City.)

contextualizing the historical sources, and vice versa: the related textual references are precisely meeting the revealed archaeological evidence. They are in complete harmony.

More than a decade of study of the archaeological legacy of the site, together with well over one hundred thousand architectural fragments, revealed the third unexpected surprise: there is enough archaeological information to reconstruct the historical built legacy of the monuments and to expose the original architecture of the once magnificent Herodian palace and city of Machaerus. Today Machaerus, together with Jerusalem, is the most authentic Gospel-related site in the Holy Land, and we may provide the most reliable and trustworthy Gospel setting through its surviving archaeological legacy.

The author won the 2020 Vatican Prize of the Pontifical Academies for his Machaerus archaeological excavations and Edizioni Terra Santa final report publications (Milan, 2013, 2015, 2019), and Pope Francis awarded him the Gold Medal of the Pontificate in 2021 (Figs. 1-2). In addition to these, the first scientific synthesis was published by the Hungarian Academy of Arts in Budapest (2021) (Fig. 3).

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Project website: machaerus.org

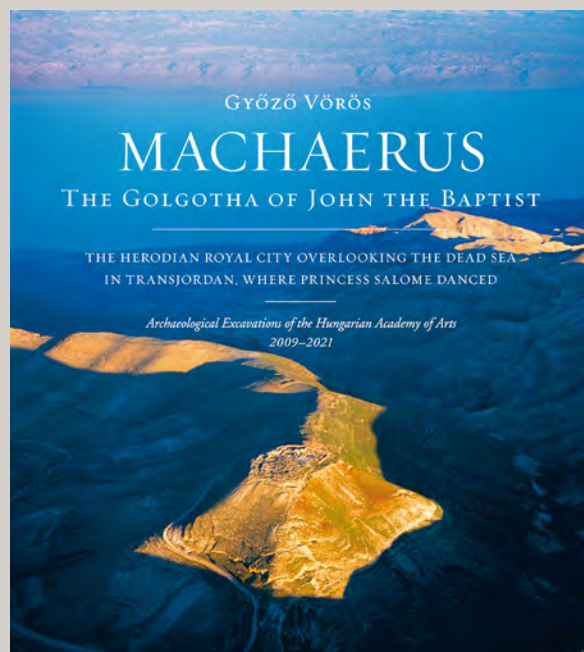


Fig. 3. The cover of the first scientific synthesis (412 pages), published by the Hungarian Academy of Arts, Budapest, 2022.

Khirbat Iskandar

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Fig. 1. Aerial view of Khirbat Iskandar and its environs, looking northwest. (Photo courtesy of APAAME [APAAME_20141013_REB-0161.jpg], by Robert E. Bewley.)

The Archaeological Expedition to Khirbat Iskandar is a long-term project for the investigation of an Early Bronze Age mound site in central Jordan, located on the north bank of the Wadi al-Wala (Fig. 1) and crucial to the understanding of the urban-rural nexus in the region during its proto-historic phases. Suzanne Richard of Gannon University, the PI and co-director of the project, started excavations at Khirbat Iskandar in 1981, with Jesse C. Long of Lubbock Christian University and Marta D'Andrea of Sapienza University as co-directors since 1994 and 2015, respectively. The expedition has, as of 2021, accomplished a pilot season, twelve major excavation seasons, and three seasons dedicated only to restorations and consolidations. In addition, in 2010 the team published one award-winning book on area C and the cemeteries surrounding the site, i.e., volume 1 in the series *Archaeological Expedition to Khirbat Iskandar and Its Environs, Jordan*.

Since the beginning of the excavations, the site has been critical for a better understanding of the non-urban Early Bronze IV period (ca. 2500–1950 BCE) that followed the demise of urbanism developed in the region during Early Bronze II–III (ca. 3100/3000–2500 BCE), thanks to the discoveries in areas A, B, and C. Subsequently, from the early 2000s, the expedition has revealed the importance of Khirbat Iskandar also during the urban period. In particular,



since 2013, the team has been disentangling the site's urban developmental trajectory, as well as modes and times of the rural transition through excavations in areas B and C. Continuous research over forty years has produced extensive archaeological records, which are in the process of being thoroughly studied and prepared for final publication. Therefore, during the forced break in international research travels because of the coronavirus pandemic, the Khirbat Iskandar team has "dug" into the expedition archive with a two-fold approach.

First, a major publication initiative is the preparation of volume 2 in the *Archaeological Expedition to Khirbat Iskandar and Its Environs, Jordan* series. This report builds on the results of the past thirteen field seasons and on stratigraphic and architectural assessments in the 2019 season. It is dedicated to the Early Bronze IV two-phase sequence in area B, which complements the evidence from area C published in volume 1. This sequence comprises a reuse/rebuilding of the fortifications (Fig. 2) and a major multi-room "public complex" dedicated to production and cultic activities, transformed into a domestic compound after a destruction, possibly due to an earthquake, and before the permanent abandonment of the site.

Second, another major effort has been to better define the processes and timing of the Early Bronze III-IV stratigraphic transition in area C, continuing the study of the stratigraphic and ceramic sequences excavated here in 2016 and 2019 (Fig. 3). This occupation comprises at least four Early Bronze III architectural phases that were followed, with no observable breaks, by a three-phase Early Bronze IV occupation. Thanks to selection and analysis of organic samples from secure, sealed archaeological contexts for chronometry, using radiocarbon for dating the samples (Fall et al. 2022), we are now able to more securely date the Early Bronze III-IV transition at Khirbat Iskandar to 2500 BCE. This is in line with the radiometric dating evidence for the beginning of Early Bronze IV at most of the other sites in the southern Levant.

The next field season at Khirbat Iskandar is scheduled for June 2022 and will build on groundwork laid in the past two years, concentrating in area C. In fact, its main objectives will be to achieve a larger lateral exposure and a better understanding of the various Early Bronze III phases identified in this sector (Fig. 3) and to connect this long sequence to the one excavated in Area B.

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Project website: gannon.edu/academic-offerings/humanities-education-and-social-sciences/undergraduate



Fig. 2. General view of the fortifications in area B, on the northwest edge of the mound, at the end of the 2019 season, looking south, showing multiple Early Bronze III rebuilds and a possible Early Bronze III/IV wall line. (Photo copyright the Archaeological Expedition to Khirbat Iskandar.)

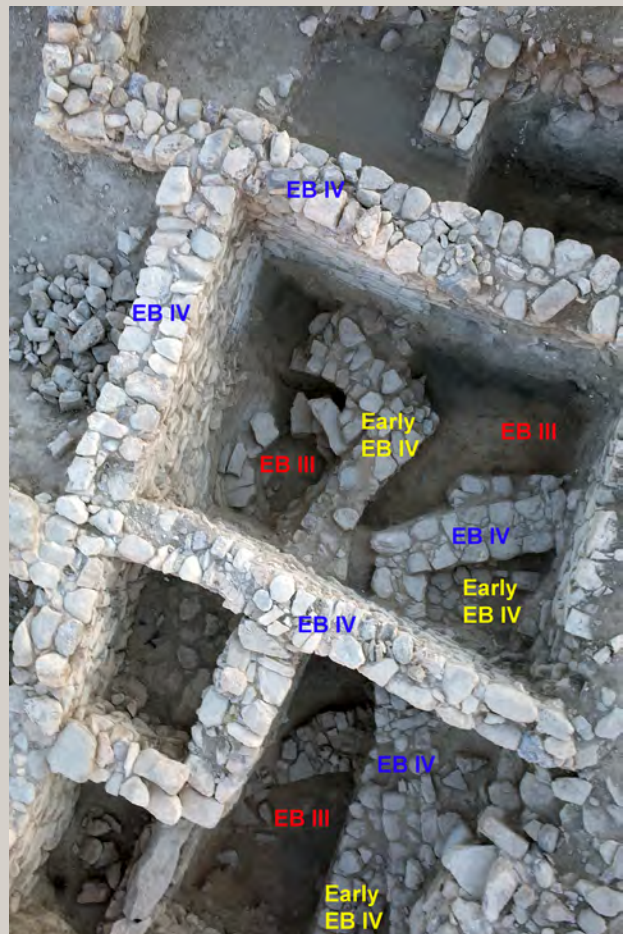


Fig. 3. General view of area C, along the eastern perimeter of the mound, from the top, showing where sondages into the Early Bronze III layers were excavated in 2019, and Early Bronze III remains under Early Bronze IV architecture. (Photo copyright the Archaeological Expedition to Khirbat Iskandar.)

Tall Dhiban: Dheban Roman Mausoleum Project

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Excavations of the Roman tomb at Tall Dhiban (Dheban) (Fig. 1) began during 2018 and continued until 2021. This tomb, considered critical to improving the understanding of the Dhiban region, is located east of the archaeological Tall Dhiban. The tomb may have been near the Roman street, as indicated by the presence of a Roman well near this mausoleum, which is still called “Bir al-Darb,” which means “the well of the road,” where one can obtain water.

The general plan of the mausoleum is similar to that of rock-cut tombs of the area, but it is irregular. It is a large cave that is almost rectangular and consists of a central outer room leading to three side rooms. The central room is built with walls that use cut stones to cover the cave’s façade, and there is a band of decoration above the doors, which is typical Roman decoration. The central room is roofed in a half-barrel shape. Unfortunately, most of the stones were missing from the front façade of this room, but through the excavation we found many decorative stones cut in a circular shape and used to decorate the door area. According to Roman traditions, burial ceremonies were practiced in the central room. Twenty-two burials were found in this tomb, including in stone sarcophagi, some of which are in the form of coffins. This mausoleum dates to the 2nd century CE, according to the preliminary study of the pottery. The tomb was reused during the Byzantine period, the date similarly based on pottery found in the excavation. The monument was reused again during the Islamic period, especially in the western room, where some coffins and parts of the columns were used to support the ceiling.

The funerary annexes that were revealed in the mausoleum building in general, and tomb no. 7 in particular, indicate the social rank of the deceased person, as the burial goods appear as a sign of wealth, and the deceased may have received a comparatively large share of care and attention.

This project studied the site from architectural, archaeological, and historical points of view. A plan has also been drawn up to rehabilitate this mausoleum so that it may become a tourist landmark in the Dhiban area.



Balu'a Regional Archaeological Project

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Fig. 1. Members of the 2021 study season team with the Iron Age II pithos they reconstructed at the Center for Near Eastern Archaeology at La Sierra University: Paul Richards, Shaun Eccles, Ryan Lopez, Kent Bramlett, Ryan Li, Joseph Rutkin, Kacey Garcia, Monique Roddy, and Maggie Apffel. (Photo courtesy of BRAP.)

With COVID-19 postponing our planned 2021 excavation season, the directors of the Balu'a Regional Archaeological Project (BRAP) decided to “pivot” (that dreaded term after two years of pandemic adjustments) and organize a study season at the Center for Near Eastern Archaeology at La Sierra University in Riverside, California. The CNEA houses material on short- and long-term loan from the Department of Antiquities of Jordan excavated from the 2012, 2017, and 2019 seasons at Khirbat al-Balu'a. Our primary purpose for this stateside season was to engage students who needed academic credit for their programs in the research side of archaeology. Students from La Sierra University and Walla Walla University traveled to campus and, with COVID-19 safety measures in place, took part in an intensive two-week study season in June 2021. Students enrolled for our “fieldwork” course worked hands-on with material from Khirbat al-Balu'a, including reconstructing a pithos, assisting with the recording process for artifacts from previous seasons, and sorting and researching potsherds for publication. Students also had the option to enroll in a seminar on household archaeology where they researched and analyzed artifacts and features from the





Fig. 2. Kacey Garcia, ASOR scholarship recipient, scanning pottery from the 2017 and 2019 excavation seasons at Khirbat al-Balu'a. (Photo courtesy of BRAP.)

Iron Age II domestic contexts at Balu'a alongside their readings. Students also attended mini workshops, including on preserving cultural heritage with Douglas Clark and managing geo-spatial information with Susan Penacho.

Working with excavated pottery was one of the highlights of the study season for everyone. Two undergraduate students particularly enjoyed their efforts reconstructing an Iron Age II pithos excavated along with several other in-situ pithoi from the domestic structure at Balu'a in 2017 (Fig. 1). One undergraduate student, Kacey Garcia, was the recipient of the American Society of Overseas Research's 2021 summer stipend award, funded by the Shirlee Meyers-G. Ernest Wright Scholarship Fund. She focused her time, in addition to her classes, on scanning pottery for publication (Fig. 2). Some of her scans were used in our presentation at the American Society of Overseas Research (ASOR) annual meeting in November 2021 on stratified ceramics from Balu'a. Finally, students worked to organize the diagnostic sherds

AIJ 3
Balu'a Regional Archaeological Project



Fig. 3. Graduate students Shaun Eccles and Paul Richards researching pottery rim profiles from Balu'a to assist with publication efforts. (Photo courtesy of BRAP.)

and research parallels in the well-stocked library at the CNEA (Fig. 3).

In addition to student activity, volunteers and staff gathered to carry out their own research or assist with data collection. Jaime Bennett continued her efforts preserving and piecing together the fragmented clay loom weights found in the Iron Age II fortification system at Balu'a, Carolyn Waldron worked on updating the artifact database from the 2012 test season at Balu'a, and all three directors worked on reassessing stratigraphy and phasing while the pottery and excavation records were easily accessible for review. We appreciated in particular the assistance and accommodation of the CNEA staff, Dawn Acevedo and Douglas Clark, who made our visit possible from registering our participants with campus authorities to reorganizing lab spaces to make room for our pottery sherds.

Project website: brapjordan.org

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Karak Neolithic Survey

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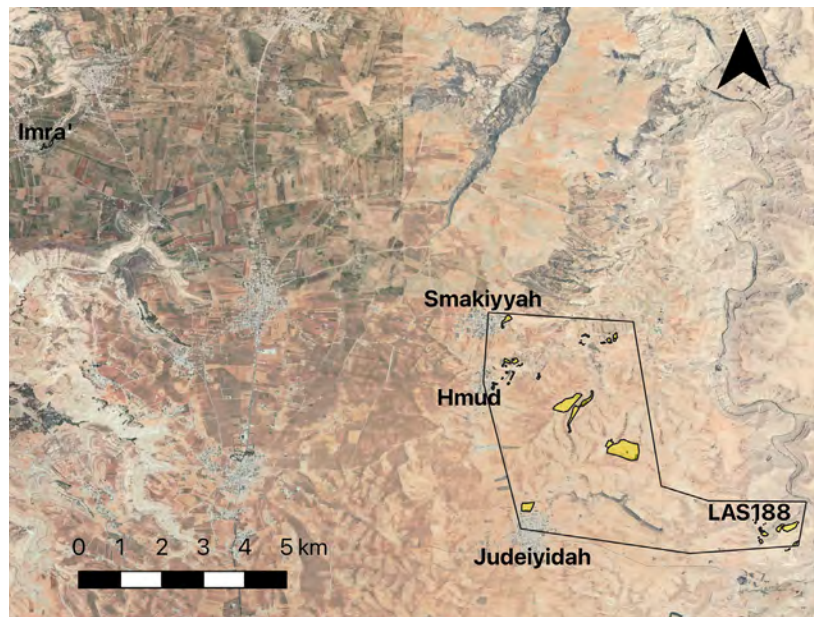


Fig. 1. Map of the location of the survey area and Imra', as well as the surveyed units. (Map generated in QGIS by P. Flohr; background: Bing Maps.)

After the inevitable eighteen-month pandemic delay, the first, pilot season of the Karak Neolithic Survey took place in October 2021. We spent two weeks with a team of six people trying to find evidence of the Neolithic on the Karak Plateau. The survey is part of a larger project investigating climate, environment, and society during the Late Neolithic (c. 6500–5000 BCE) on the Karak Plateau. The reason we are interested in this period is because this is when the earliest mixed farming and mobile pastoralist communities were being established. At the same time, it was a period of longer-term aridification, compared to the earlier Holocene, and the so-called 8.2 ka arid event of between 6250 and 6000 BCE—although the local manifestation of these developments in Jordan remains unknown.

Our specific study area runs from Smakiyya in the northwest to Judayyda in the south and eastward to the Wadi Abu Sha'ar Neolithic site (S. Thomas Parker's *Limes Arabicus* Site 188; Parker 2006) (Figs. 1 and 2). We chose this area because it lies on the present-day boundary between rainfed agricultural fields and the drier steppe zone. It is likely this boundary shifted during the past, and the area was probably sensitive to climatic changes. We also revisited the site of Imra', northwest of the study area within the rainfed-farming zone.

Because Late Neolithic sites are famously difficult to find—except for those in current arid areas—we intend to





Fig. 2. Late Neolithic chipped stone from the Wadi Abu Sha'ar site. (Analysis by Bill Finlayson; photo by Pascal Flohr.)

apply the Bayesian modeling methods of Banning and Hitchings, successfully used in northern Jordan (Hitchings et al. 2016). While information in our study area was limited and we could not set up a proper model yet, we used information regarding previously documented Late Neolithic sites throughout Jordan (see Flohr 2022) to establish criteria for higher probability of finding Neolithic sites, then also using remote sensing to select medium-high probability areas or survey units. We also checked low-probability areas as controls.

During the two weeks, we visited eighty-two such survey units, recording the location and archaeology for each of these, systematically collecting a sample of chipped stone and diagnostic ceramics of all present periods. Many of the units were so rich in chipped stone that we had to cut the fieldwork short in order to complete preliminary analysis of this material in time.

Of the eighty-two survey units, we classed twenty as “off-site,” some with either no or almost no artifacts, but mostly with very low-density background scatters. These were mainly in locations with negligible to low probabilities for finding Neolithic, or any, habitation sites. The remaining units yielded artifacts dating from the Paleolithic to Islamic (and modern) periods, albeit with apparent consistent chronological gaps (Epipaleolithic, Pre-Pottery Neolithic A). At least two Neolithic sites are present in the survey area, with another one documented below Imra'. The latter is interesting, as it gives further credence to the idea that part of the reason for the invisibility of Late Neolithic sites is that they are below multi-period mound (tall) sites, forming the first part of “later” settlement patterns. We spotted

the few pieces of Neolithic chipped stone at Imra' only because they had been churned up in an animal hole at the base of a bulldozer cut at the side of the tell. Interestingly, not below but near Hmud we found a—to our knowledge—previously undocumented site apparently dating to both the Pre-Pottery and Late Neolithic periods (Fig. 3). This area will form a major focus of future work and appears rich in remains from many periods.

Funding for the project was provided by the University of Oxford John Fell Fund, the EAMENA project (funded by the Arcadia Fund), and the University of Kiel ROOTS Excellence Cluster—Dietary ROOTS.

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Fig. 3. View from the Neolithic site near Hmud. (Photo Pascal Flohr.)

Expedition to the Dead Sea Plain

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In 1973, R. Thomas Schaub, together with his colleague Walter Rast, designed and initiated the interdisciplinary research program of the Expedition to the Dead Sea Plain (EDSP) to investigate the rise of Early Bronze Age (EBA; 3600–2000 BCE) urban society, with a distinct focus on links between environmental and social systems. Funded by a Wenner-Gren Foundation Historical Archive Grant, and in cooperation with the Carnegie Museum for Natural History, in 2018 we began curating the archives of the late R. Thomas Schaub (Fig. 1). Organizing and processing this archival collection is integral to a more complete understanding of the history of archaeology along the Dead Sea Plain in Jordan, as well as the emergence of EBA small-scale urbanism. Schaub's correspondence, research reports, photographs, and presentations chronicle their efforts to transform southern Levantine archaeology into



Fig. 1. University of Notre Dame student Madeline Kohl processing the Schaub archives. (Photo by M. S. Chesson.)



an anthropologically grounded discipline. During the pandemic, archival processing has continued with an emphasis on the cemetery excavation at Bab adh-Dhra', whose history encompasses the emergence, florescence, and decline of Jordan's earliest fortified communities. Mortuary practices shifted with transformations in the lives of EBA peoples as they moved from small villages, hamlets, and farmsteads into the earliest walled towns and cities. The EDSP's 1970s and 1980s excavations of the cemetery promises to transform our understanding of this dynamic society. The crucial archival work moves us closer to analyzing and publishing these scientific results from the EDSP's research at this extraordinary site.

Due to delays arising from the pandemic and before the Department of Antiquities developed and implemented a revised drone policy, we have been unable to monitor change (natural and anthropogenic) over time at the Early Bronze Dead Sea Plain sites. In cooperation with the Jordanian Department of Antiquities, we have turned to high-resolution satellite imagery to continue our work. Birds'-eye views of these sites and landscapes provide excellent vantage points for understanding the past and assessing anthropomorphic change over time. With a grant from the DePaul Department of Anthropology we acquired high-resolution satellite imagery (WorldView 30 cm and QuickBird 40-60cm, from 2007, 2011, and 2014), KH-9 Hexagon imagery (1971-1986), and a series of aerial photographs (2008-2019) of the three cemeteries at Bab adh-Dhra', An Naq, and Fifa (Fig. 2). Employing

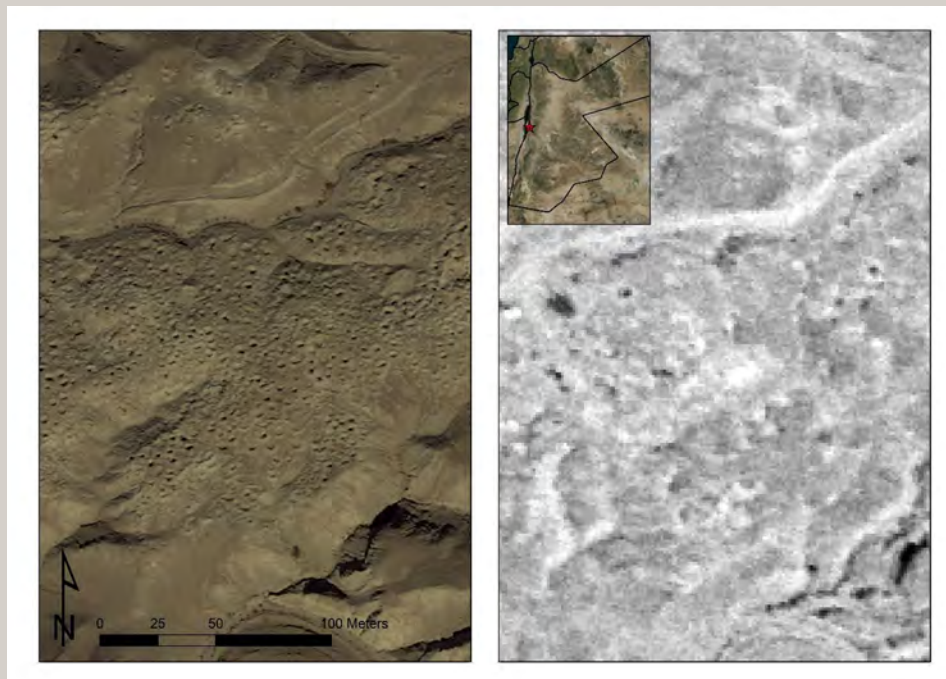


Fig. 2. Comparison of one area of Bab adh-Dhra' in 2021 (left, ©Airbus DS 2021) and 1974 (right, KH-9 HEXAGON image courtesy of the U.S. Geological Survey.)

the “brute force” approach to regional remote sensing-based archaeological research (Casana 2014; Casana 2020) our collaborative team is inspecting images from the three study areas systematically and methodically and comparing them with the drone imagery collected from 2012–2016. Our hope is that the results of this research will offer a model for future remote sensing-based archaeological and heritage monitoring efforts in Jordan and beyond.

Unable to carry out research during a year of leave, Kersel also accomplished a complete revision of the Follow the Pots website (followthepotsproject.org).

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Project website: expeditiondeadseaplain.org

Jafr Basin Prehistoric Project

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Like many other projects, our fieldwork in the al-Jafr Basin, southern Jordan, was completely frozen during these two pandemic years, so we spent this unexpected sabbatical reorganizing research data from the Harrat Juhayra Sites recently investigated and redating two Neolithic sites previously excavated. The former task has come to fruition as two reports (“Harrat Juhayra 2: Excavations at a Chalcolithic Settlement in the al-Jafr Basin, Southern Jordan” and “Harrat Juhayra 1–3: Excavations at Chalcolithic Ritual Fields in the al-Jafr Basin, Southern Jordan”; see also Fujii 2020), both of which are due to be published in the next volume of *Annual of the Department of Antiquities of Jordan*.

This paper briefly introduces the results of the second task. Our operation focused on two Neolithic sites devoid of ^{14}C dates: a Pre-Pottery Neolithic B desert outpost of Wadi Chuwayr 17 and a Late Neolithic open sanctuary of ‘Awja 1. A total of seven ^{14}C dates, six from the former site and one from the latter, were obtained by Takao Matsui of Shirakawa Radiometric Laboratory (IAAA) from charcoal remains excavated in earlier seasons and housed in our laboratory at Kanazawa University (Table 1).

Wadi Chuwayr 17 was excavated in the 2010 summer field season (Fujii et al. 2012). The excavation revealed a small structural complex composed of five large and small semi-subterranean masonry structures, tentatively dated to the Middle/Late PPNB transitional period on the basis of typological similarity to complex I at Wadi Abu Tulayha, a type site of the Jafr outpost PPNB (Fig. 1). Five of the six ^{14}C dates converge on the middle of the 8th millennium calBCE, corroborating the validity of the typological comparison. This finding has ensured anew the existence of the Jafr outpost PPNB supposedly derived from farming communities that dotted the intermountain basins of southern Jordan.

Meanwhile, ‘Awja 1 was excavated in 2011 and 2012, together with the other four analogous sites (i.e., ‘Awja 2–5) (Fujii et al. 2013). What attracted our attention was that this open sanctuary isolated in the desert near the border with Saudi Arabia was associated with slab-lined feline depictions similar to those found at Biqat ‘Uvda 5 in the Negev Highlands and Jebel Khasm et-Tarif in the northeastern corner of the Sinai Peninsula (Fig. 2), which enabled us to tentatively date the site to the second half of the Late Neolithic. However, only one date, the ^{14}C date from unit C of complex I (immediately behind the feline depictions), provides further support for that Late Neolithic date. This finding has demonstrated that the unique artistic expression (and some group ritual represented by it) was shared in common between the east and west of the Lower Jordan Valley during the Late Neolithic.

Both new findings have not only eliminated ambiguities





Fig. 1. Wadi Ghuwayr 17: General view as of September 21, 2010 (looking north-eastward). (Photo by Sumio Fujii.)

left in the chronology of the Jafr Basin, but they have also contributed to a better tracing of the Jafr Neolithic that holds a key to the issue of understanding pastoral nomadization in the southern Levant. These two years were never meaningless. We do hope that our fieldwork in Jordan will be resumed before long.

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AIJ 3
Jafr Basin Prehistoric Project

Table 1. ^{14}C dates from WGW-17 (Wadi Ghwayr 17) and 'Awja 1.

Site	Structure	Locus	IAAA No.	Material	yrBP	calBCE 2 σ (%)
WGW-16	1	509.sfl	202219	Charcoal	8493 \pm 34	7591-7513 (95.4)
	1	509.sfl	202220	Charcoal	8647 \pm 34	7733-7590 (95.4)
	2	515.sfl	202221	Charcoal	8465 \pm 32	7585-7491 (95.4)
	2	511.sfl	202222	Charcoal	8464 \pm 34	7585-7488 (95.7)
	3	503.sfl	202223	Charcoal	8374 \pm 33	7531-7346 (95.4)
	4	507.sfl	202224	Charcoal	8177 \pm 33	7199-7066 (67.0)
Awja 1	C	102.hfl	210234	Charcoal	6209 \pm 30	5188-5050 (76.2)



Fig. 2. 'Awja 1: Close-up view of the feline depictions as of September 27, 2012 (looking westward). (Photo by Sumio Fujii.)

Petra: Islamic Baydha Project

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Fig. 1. Training on Buildings Archaeology at the Islamic Baydha Project. (Photo by Steven Meyer.)

During seasons 2020 and 2021, the Islamic Baydha Project had two study seasons, focusing on the processing of data and finds, in preparation for publications, and on project presentations. In 2020, a research grant was generously awarded by the Barakat Trust, one of the project's main funders, for a study season which took place mainly at the American Center of Research in Amman. This season included a complete study of the Islamic-period ceramic finds from all excavation seasons and the drawing of architectural plans. The flotation of the archaeobotanical material also took place at the American Center, where samples for ^{14}C analyses were also selected from the most promising stratigraphic units of the two mosques. An in-depth study of the archaeobotanical materials by Annette Hansen took place at the University of Brussels, and a series of optically stimulated luminescence (OSL) analyses of soil samples from one of the mosques was undertaken by Dr. Timothy Kinnaird at the University of St. Andrews. The results of the OSL analyses were not conclusive on this occasion, and they highlighted the need to identify the chronology of the mosques from an additional perspective. (For more on the study season carried out at the American Center during the pandemic years, see Sinibaldi 2020a)

During these two years, there was also a focus on presenting preliminary results on the Islamic Baydha Project and the broader Late Petra Project in online conferences and meetings. Micaela Sinibaldi presented on the Late Petra Project for the series Archaeology of the Middle East and North Africa from Late Antiquity to the



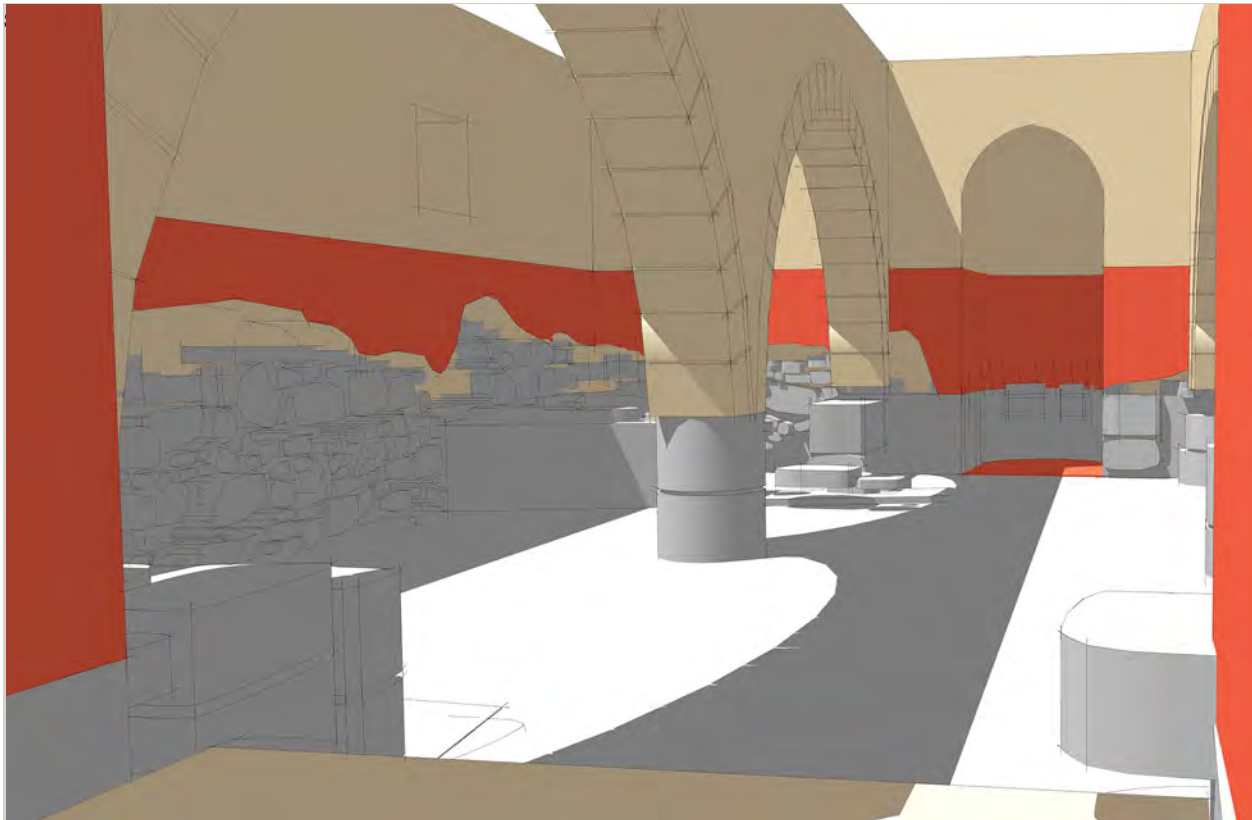


Fig. 2. Reconstruction of interior of Mosque 1. (Graphic reconstruction by Qais Tweissi.)

Ottoman Period organized by the Institut français du Proche-Orient (25 February 2021; published in Sinibaldi 2021); on the Islamic-period ceramics from southern Transjordan at the Ceramics from Islamic Lands conference organized by the Victoria and Albert Museum, London (20 July 2021); on the program of community engagement of the Islamic Baydha Project for the Coronomics and Cultural Heritage in the Middle East workshop organized by the Politecnico of Milan (15 November 2021); and on settlement in Petra in the Islamic and crusader periods at the online portion of the annual meeting of the American Society of Overseas Research (December 2021).

In addition, the final phases of production of a video documentary on the Islamic Baydha Project have been completed. The film was selected for screening and the awards competition at the Rovereto International Film Festival, Italy (October 2021), the Agon Festival in Athens, Greece (May 2022), and at the Festival del Cinema Archeologico di Agrigento, Italy (July 2022), where the project been presented specifically for its component of training and community engagement. In figures 1-3, some of the components of the Islamic Baydha Project illustrated in the video documentary are shown: the training of Jordanian archaeologists, with a focus on female participants (Fig. 1); 3-D reconstruction of the interior of Mosque 1 for future presentation of the site to the public (Fig. 2), and engagement of schools of the Petra region during the Schools Day (Fig. 3).

In 2020, the final version of the volume *Islamic Heritage Sites in Jordan*, edited by Ammar Khammash and Thomas Weber, was published; it includes an entry on the two mosques of



Fig. 3. Schools Day at the Islamic Baydha Project. (Photo by Micaela Sinibaldi.)

Baydha, with architectural reconstructions of the structures (Sinibaldi 2020b). In moving toward the final publication of the materials from the Islamic Baydha Project, as part of the broader Late Petra Project, contributions have been submitted by Sinibaldi on the study of ceramics of the Islamic period from the Petra region; for the upcoming final publication of the fieldwork in Baydha directed by Patricia Bikai for the American Center of Research (2003–2008); for the Beidha Documentation Project, in preparation; and for *The Pottery of Jordan: A Manual*, edited by Jihad Haron and Douglas R. Clark (2022). A contribution on the study of ceramics from excavations at Ba’ja I (Petra region) by the German Protestant Institute of Archaeology is currently in preparation.

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Project website: islamicbaydhaproject.wixsite.com

publications.acorjordan.org/aij

Petra: The Ad-Deir Monument and Plateau Project

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Fig. 1. The façade of the Ad-Deir Monument, 2013: width, 46.77m/153ft; height, 48.3m/158ft. (Photo by AMPP/C. Finlayson.)

The Ad-Deir Monument (the “Monastery”) is one of the most aesthetically important and largest late Hellenistic-to Roman-era Nabataean rock-cut façades within the Petra National Archaeological Park of Jordan (Fig. 1). In antiquity, the Nabataeans of Petra surrounded this monument with sophisticated water catchment structures that demonstrate an incredible knowledge of the local topography with relation to the control and exploitation of renewable seasonal flood-water resources. In 2013, the Ad-Deir Monument and Plateau Project (AMPP) was charged by the Jordanian Department of Antiquities and the Petra Park Authority with the task of preserving the Ad-Deir Monument via the archaeological excavation, study, and restoration of the Nabataean structures originally built to preserve the Ad-Deir complex from seasonal erosion (see Jenkins et al. 2016).

All archaeological work in 2020 was cancelled due to COVID-19; however Brigham Young University allowed a small professional staff (without students) to renew work at Ad-Deir in 2021. There were two major foci for this season, which included the completion of the clearances of Eastern Cistern B (Fig. 2) and renewed efforts to continue clearances and restoration of the Great Circle of Ad-Deir, a giant water-catchment facility, 60 m in diameter, that included a massive dam, rock-cut walls and entrance ramp, and a pre-existing Nabataean quarry (Fig. 3).





Fig. 2. Eastern cistern B and the Bedul and Amareen clearance crew at the end of the 2021 season. (Photo by AMPP/C. Finlayson.)

After five seasons of excavation, Eastern Cistern B was completely cleared of all erosion fill in 2021, revealing a finely plastered structure capable of holding up to 500 cubic meters of water when filled to capacity (Fig. 2). The analysis of pottery obtained from this cistern indicated that it was in use from at least the early 1st century BCE through the late Nabataean period (post 106 CE). Given the probable rock-cut symposium room above the cistern with an associated cliff inscription mentioning symposia to the deified Nabataean king Obodas (probably Obodas I, c. 96–85 BCE), it was not surprising that the pottery recovered from this cistern did not reflect a preponderance of water-carrying vessels such as amphorae, but rather Nabataean fine dining wares and so-called cooking pots (for the Obodas inscription above Eastern Cistern B, see Zayadine and Farajat 1991). Apparently, after a ritual dinner was held in the rock-cut room above the cistern, the vessels were simply dropped into the water below.

Continued work on the Great Circle was also pushed forward in 2021. Fully one half of the Great Circle is now cleared and studied (Fig. 3). This work has revealed that the Great Circle was damaged in the 31 BCE earthquake mentioned by Josephus (*Antiquities of the Jews* 15.2), indicating that it had been built before this time and was subsequently utilized until the annexation of Nabataea by Rome in 106 CE, when Nabataean control of the large-scale water systems of Ad-Deir seem to have been abandoned due to the loss of a centralized government with royal links to the site. Recovered artifact assemblages indicate the intensified usage of the plateau during the reign of Aretas IV and his wars with Judea.



Fig. 3. The Great Circle of Ad-Deir at the beginning of the 2021 excavation season. (Photo by AMPP/C. Finlayson.)

Over 900 ancient coins have been recovered by the AMPP, with 88 percent minted by this king. The inclusion of multiple mint series on Ad-Deir may indicate that Aretas IV stored his coinage here, given the plateau's strategic advantages over the more vulnerable lower city during times of war. Other coins retrieved from both Eastern Cistern B and the Great Circle indicate that the strategic advantages of the Ad-Deir plateau were again utilized during the Byzantine era under Emperor Constantius II during his wars with Persia.

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Petra: Temple of the Winged Lions

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Fig. 1. Pauline Piraud-Fournet and Nora Al Omari at the American Center of Research, processing artifacts in February 2020. (Photo by J. Green.)

A continued and increased focus on archival study and publication of the Temple of the Winged Lions (TWL) was already underway at the time that the global pandemic struck in March 2020: a major phase of conservation of the Temple of the Winged Lions, presentations of work conducted at the site, and pilot visitor surveys had already been completed in 2018–2019 (Green and Piraud-Fournet 2020).

American Center of Research (ACOR)-TWL Publication Fellow Pauline Piraud-Fournet (Institut français du Proche-Orient) completed a major report on key findings and research to date on the American Expedition to Petra (AEP) and the TWL Cultural Resource Management Initiative (TWLCRM) in summer 2020 (Piraud-Fournet 2020), which in turn contributed to a coauthored article published in



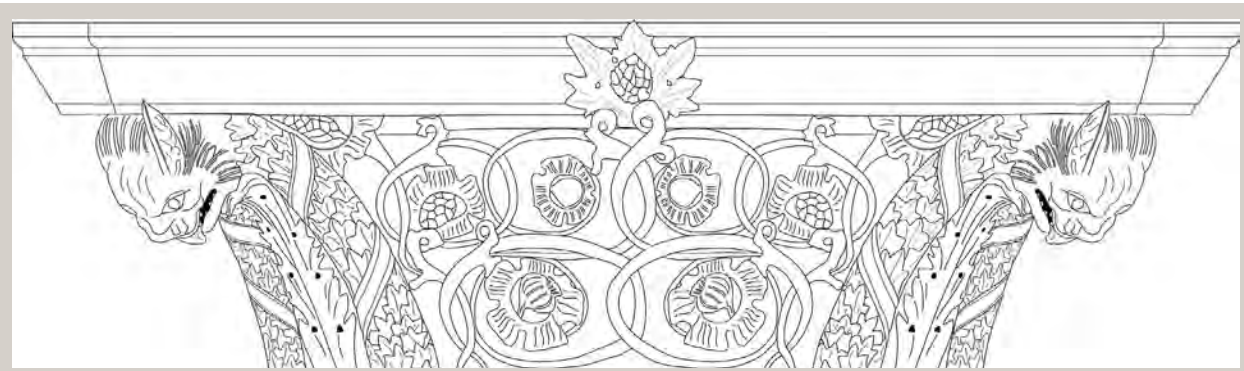


Fig. 2. Capital with lion heads from TWL. (Drawing by M. Dehner, 2021).

Near Eastern Archaeology (Piraud-Fournet et al. 2021). American Center intern Nora Al-Omari was able to finalize the inventory of physical objects from the AEP and TWLCRM that had been housed at the American Center in 111 crates since just before the March 2020 lockdown (Fig. 1), and she was able to complete the digital inventory remotely, thus allowing the project to develop at a significant pace despite lack of physical access.

In October 2020, the second ACOR-TWL Fellow, Marco Dehner of Humboldt University, traveled to the American Center in Amman, where he carried out archival research on the decorated stone from the TWL that the AEP and the TWLCRM Initiative had documented, and he also continued analysis of the existing lapidaria at the TWL site. Dehner's in-person visits to Petra in the winter of 2021 allowed for verification of archival data, new photographic documentation, and measuring of specific sculpted elements on the TWL site (Dehner 2021) (Fig. 2). With this research, a database of approximately 1,200 objects—as well as accurate illustrations to be made for key elements of the decorated stone from the Temple of the Winged Lions (Fig. 3), the North Court, and possibly adjacent buildings—could be completed. Dehner wrote a chapter and catalog of the decorated stone of the Temple of the Winged Lions for the final report.

Jack Green served as the project director of the TWLCRM Initiative and TWL Publication Project through June 2021, supervising the work of interns and fellows, and guiding specialist researchers. Other chapters completed (and subsequently edited by Noreen Doyle) in 2021 included “Temple of the Winged Lions: Project Histories” (Green and Piraud-Fournet), “Site Accessibility and Presentation” (Green), “Visitor Survey and Tracking” (Green and Mukhles M. Al Ababneh) and “Personal Ornaments and Cosmetic Implements” (Green). Major progress was furthermore made with Robert Wenning's contribution on the TWL sculpture.

A grant application submitted to the National Endowment for the Humanities by Green in November 2020 was successful, resulting in significant funding that will allow the American Center to continue preparations for specialized research and publication of the TWL volume. Since July 2021, Doyle and Pearce Paul Creasman have overseen the publication project and its grant, with Green continuing to serve as advisor and coeditor.

S. Thomas Parker, the TWL Publication Project's original advisor and mentor, died in September 2021.

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Fig. 3. Lapidarium 1: mapping of the documented stones at the TWL site. (SfM 3-D model by M. Dehner, 2021).

Petra: Architectural Earth-Sun Alignments

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The relationship of architecture, urban morphology, and celestial pathways have been integrated since classical times (e.g., Newgrange, Chitzen Itza, Stonehenge). However, in Petra such relationships are only hinted by its earliest western explorers, such as Bachmann, and Libbey and Hoskins. Paradise (1999) first identified the possible relationship of solar pathways, structural alignment, and their horizon contacts in the Petra Theater. Through advanced spatial analysis, nutated celestial paths were analyzed across Petra (Figs. 1–3). Not only have several façades been found oriented to illumination on solar marker days (solstices, equinoxes), but interior elements have been identified as associated with seasonal sunlight, as well. Since 2000, to correlate earth-sun relationships to architecture, GPS, GIS, computer cartography, laser measuring, and remote sensing have been used to link architectural footprints, horizon diagrams, and nutated sun risings and settings on marker days—vital relationships used in cultural, social, agricultural, and religious rituals and in designs, reckonings, and feast days (Paradise and Angel 2015).

It was revealed that earth-sun relationships to architecture and urban form can be divided into two categories (exterior facades vs. interior chambers), with two sub-categories: specific orientations (e.g., equinox sunset only) or combined effects (e.g., equinox and solstice sunrise). Some sites had broader relationships to other special sites through lines of sight (e.g., Jebel Haroun) and/or those co-aligned within urban patterns. Of the thirty primary Nabataean-Roman structures addressed by Brünnow and Domaszewski, Bachmann, and Libbey and Hoskins, many structures (80 percent) exhibit some obvious and some tenuous earth-sun relationships (Paradise and Angel 2015). However, current research addresses solar pathways to additional structures.

Past research revealed *summer-solstice sunrise* alignments in five structures (17 percent), including the Tomb of the Roman Soldier in Wadi al-Farasa (midsummer's eve). Oddly, al-Khazneh (the Treasury) is aligned exactly with the solstice sunrise; however, that illumination is obscured by the naturally facing cliff face. *Summer-solstice sunset* alignments were found in ten structures (33 percent), including the Palace, Renaissance, Broken, and Pediment Tombs, in the triclinia in al-Farasa, High Place of Sacrifice, and Bab as-Siq, and in the Entrance Tomb in Siq al-Barid (Fig. 3). These alignments exhibited marker-day illumination on hewn chamber walls, niches, and/or glyptics. *Winter-solstice sunrises* were related to two structures (7 percent): the Columbarium and Turkmaniya Tombs. *Winter-solstice sunsets* illuminated nine structures (30 percent), including the Palace, Urn, and Corinthian Tombs, and alignments with



the Theater and the Garden Tomb. Accurate surveying of the southern plaza on al-Habis revealed accurate sandstone carving aligned with cardinal compass points as well, indicating an emphasis on east-west orientations (Fig. 3).

New findings revealed relationships where *winter-solstice sunsets* illuminate eleven structures (37 percent), including the Urn, Palace, Garden, Triclinium, Renaissance, Broken Pediment, and Obelisk Tombs, and the Bab as-Siq Triclinium. *Equinox sunrises* were found in four structures (13 percent), including the Unfinished and Roman Temple Tombs (Fig. 2). Some monuments and structures were also found to have defined, hewn east-west alignments, indicating equinoctial axes at the High Place on al-Habis and the hewn obelisks on Jebel al-Madhbah—exactly aligned east-west (090°N, 270°N) (Fig. 3). East-west alignments as solar markers have been noted from Newgrange, Chitzen Itza, and Stonehenge, to separate the year into the cool, dark half (e.g., Saturnalia, Haloa) and the warm, light half (e.g., Vestalia, Kronia), with the equinox beginning and ending each half.

Since many western festivals are still associated with solar marker days (e.g., Easter, Christmas), prior studies indicate that lunisolar calendars were fundamental to early communities and rituals, including those of the Nabateans. However, more research is needed to better understand whether these alignments were indeed engineered and not arbitrary or habitual. So, an inventory of Petra's architecture associated with earth-sun relationships might be essential to our understanding of Nabatean cosmology, urban planning, and theology and also as a central paradigm in its culture, society, agriculture, and even urban morphology.

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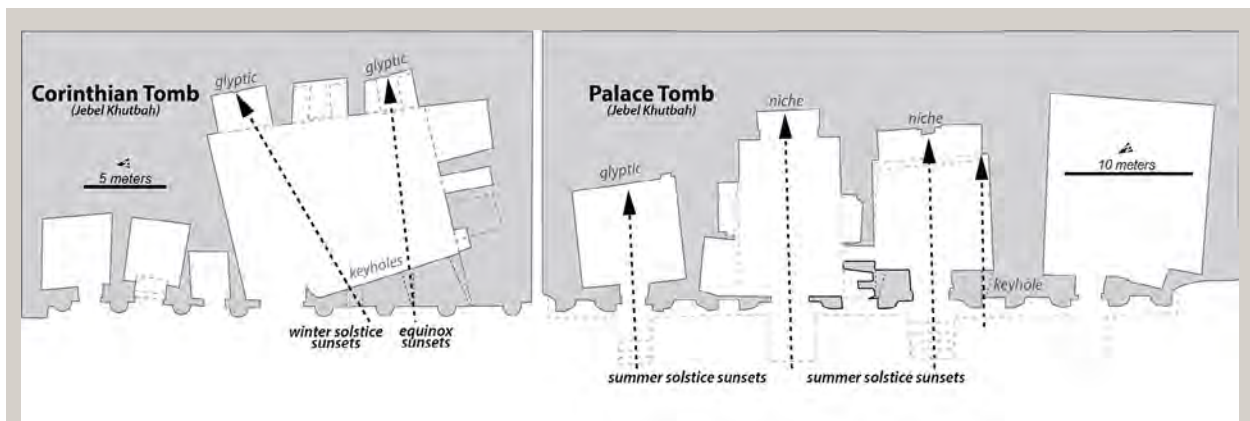


Fig. 1: The Corinthian and Palace Tombs are part of Petra's "Royal Tombs," and both revealed solar alignments on marker days illuminating the chamber interiors. The Royal Tombs, in general, face most sunsets, but it was the unique carving of "keyholes" in the façades that facilitated the sun's shining on the chamber walls of the tombs during the marker day sunsets. (Cartography by Tom Paradise.)

AIJ 3

Petra: Architectural Earth-Sun Alignments

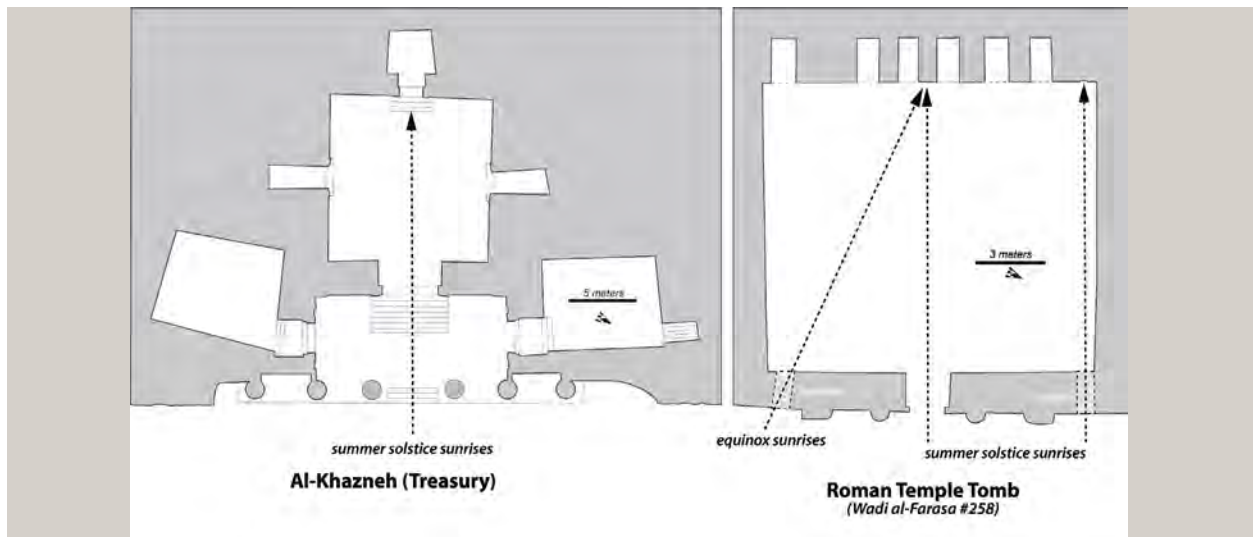


Fig. 2: Even Petra's most recognizable façade and chamber, al-Khazneh, divulged an unusual alignment directly with the rising sun on the summer solstice. However, the sun was/is unable to reach the chamber due to the high facing cliff wall. Was this a habitual orientation in Petra, or was the cliff face to be removed in part to permit sunlight to enter the chamber on this important annual marker day? Even in Wadi al-Farasa, the canyon adjacent to the Street of Façades, the Roman Temple Tomb (#258) revealed notable sun alignments on marker days directly through the main portal and through two additional keyholes carved directly through the façade. (Cartography by Tom Paradise.)

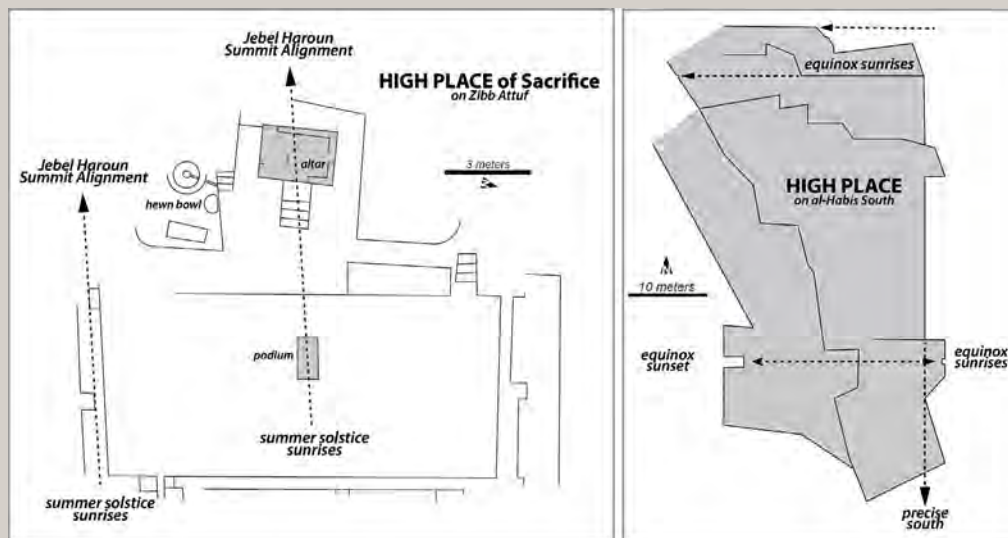


Fig. 3: Not only were marker days found to align with the rising and setting sun through doorways and "keyholes," but surrounding landscape elements were also found to align. It is known that ad-Deir (the Monastery) directly faces the peak and structure atop Jebel Haroun. However, the podium and altar on the "High Place of Sacrifice" atop Zibb 'Atuff are also in alignment with the peak of Jebel Haroun. This alignment is visible from the High Place plaza area. To a lesser degree, numerous areas across Petra—such as the southern "plaza" on al-Habis—have been found to have been designed, hewn, and/or oriented with direct (and often very accurate) positionings to cardinal compass points and/or marker-day orientation. (Cartography by Tom Paradise.)

Petra Sculptures

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Up to 2019, six seasons to document Petra's ancient sculptures had been carried out (for the best previous such project, see El Khouri 2010). The project, started in 2013 under the premise of "protecting by publication," was finished just before the large reorganization of the Petra Museum in the spring of 2019. The old museum inside the Petra Archaeological Park, the Cave Museum, and the exhibition in the visitor center were closed and replaced by the wonderful new Petra Museum near the entrance to the site. The storerooms of the old museum were totally emptied and the materials transferred to another place. More than 800 figural sculptures have been documented by my project, and a first large volume is planned for 2023. It contains about 400 objects from the center of Petra, all from known find-spots, mainly from excavations, although it excludes the French Expedition to Petra and the American excavations at the ad-Dayr plateau. Those finds are still being studied by the excavators.

The decision to present the sculptures by findspot, area, and complex instead of grouping them by subject was the correct one, considering the fragmentary status of many sculptures. In the description of each sculpture, the focus is put on four points: the exact place and the context where the sculpture was found, a description of the state of preservation, a description of the motif, and a classification with a review of previous interpretations. The manuscript contains more than 900 pages and includes photos of each object (usually providing more than one view). Due to the coronavirus pandemic and limited access to libraries, art-historical classification caused a delay in publication.

The second planned volume will contain the rock-cut figural art around the center of Petra (112 sculptures) and finds from the suburbs Wadi Musa, Beidha, Khirbet Brak, and Sabra (eighty sculptures). We do not know the findspot of seventy-eight sculptures from Petra. Another forty-four sculptures were bought at Petra and found their way into various museums and collections.

In my paper read at the 2015 International Conference on the History and Archaeology of Jordan (ICHAJ) in Florence, I demonstrated that there is surprisingly more than is commonly known in every respect. The documentation will be a basis for a better understanding not only of single sculptures but also for complexes, developments and changes, intentions, and the general character of the sculpture at Petra.

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Fig. 1. Great Herculeaneum Woman, Jordan Archaeological Museum, Amman. A Roman import from the early 3rd century CE, this sculpture was found in 1933 between Wiegand's "Palace" and the Temple of the Winged Lions. (Photo by L. J. Kramer.)