

## UMM AL-JIMĀL SITE PRESENTATION: PRESENTING ANTIQUITIES AND HERITAGE TO SERVE DIVERSE COMMUNITIES

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### ARCHAEOLOGICAL DEVELOPMENT AND THE ECONOMY OF HOUSING AT UMM AL-JIMĀL: SOME PRELIMINARY FINDINGS (M. Cheyney)

The primary objective of the 1998 ethnographic survey was to explore local residents' perceptions of the proposed development of archaeological features that surround and are integrated into the modern settlement. This project was motivated by the recognition that the people living in the immediate vicinity of the ruins will experience the effects of tourism and development most acutely and should, therefore, have the opportunity to voice viewpoints, concerns and suggestions. The portion of the research presented here focuses on the Umm al-Jimāl residents' interpretations of archaeology as it pertains to the ownership of the past and their negotiations of the ideals of ownership with the present realities of economic struggle<sup>2</sup>.

Extensive plans for the preservation and consolidation of standing stone structures that have become destabilized over years of natural and human disturbance (de Vries 1994; de Vries *et al.* 1996) have been developed along with outlines for the design of a walking tour and a museum/visitor center (see de Vries, this volume). Proposed preservation and restoration at the site is based on the notion that archaeologists must attempt to slow both natural and human destabilization processes if the ruins of Umm al-Jimāl are to be maintained for research and tourism. Solving the problem of 'human interference' at the site in the form of vandalism and theft of

movable objects such as inscriptions and carved masonry fragments, is, in some ways, more difficult to address.

The proposed means of halting the destruction – the instilling of shared heritage by teaching appreciation and understanding of the antiquities – is based on two assumptions: (1) that an appreciation for the ruins as part of a common heritage does not already exist, and (2) that if this understanding did exist, the inhabitants of Umm al-Jimāl would no longer remove objects from the site. Interviews with Umm al-Jimāl residents, facilitated by a local translator, were designed to test these assumptions. Preliminary study suggests that the actual relationship between the villagers and the ruins is more complex than assumed in the current version of the development proposal. Responses indicate that, from the Umm al-Jimāl residents' perspectives, an appreciation and indeed a deep love for the material remains of the site are not necessarily in conflict with an ethic that allows for removal, alteration and reuse of ancient objects. Interviews revealed three distinct facets or levels of appreciation for the Umm al-Jimāl ruins that I have termed the (1) *Historical*, (2) *Aesthetic / Status* and (3) *Utilitarian Models* of archaeological properties.

The first category of informants' responses revolved around the notion of architectural remains as central to the historical identity of villagers. All of the study participants (n = 10), young and old, shared stories about the tribe's original settlement in the ruins and the process of gradually moving from the goat hair tents

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1. Paul Christians, Jeff DeKock and Craig Mulder; Open Hand Studios. Tawfiq al-Hunaiti and Mowafaq al-Fayez, Department of Antiquities of Jordan. Bernhard Lücke, German-Jordanian University. Muaffaq Haza,

Umm al-Jimāl.  
2. Muaffaq Haza has made significant contributions to several aspects of the research reported in this article.

erected in spaces between ruined structures and the use of old buildings as kitchens, storage facilities, and places in which to work during the heat of the day, to the more permanent mud and stone dwellings built outside the limits of the ruins in the 1960's and 70's. In addition, older informants walked with me through the Byzantine town and identified the tumbled structures they had lived in as children. They pointed out that the Arabic words painted over some of the ancient doorways were names of families who had occupied specific buildings (**Fig. 1**). This occupation appears to have been status-based with the most prominent families utilizing the most elaborately constructed and well-preserved of the ancient structures. Painted names and other identifying marks, or the 'vandalism' of remains from the archaeologist's perspective, are, for the residents of Umm al-Jimāl, potent reminders of their tribe's historical connection to Umm al-Jimāl.

A second pattern that I have labeled the *Aesthetic /Status Model* is based on informants' reports, as well as on my observations of the connection between family status in the village and the reuse of decorative fragments as architectural accents in courtyards, gardens, and fences (**Fig. 2**). The integration of antiquities into building designs is pervasive throughout the village; so pervasive, in fact, that in my four summers of field work there, I never visited or walked past a single home that did not boast some fragment of a column, arch, carved lintel or decorative relief. However, the most telling evidence of the significance of these antiquities is in the house of the village Shaykh, Hail el-Serour. The original



1. Family names of Talal es-Serour and Jamal es-Serour inscribed on painted lintel doorways (historical model).



2. Late Ionic capital used as a decorative piece on porch of house built by Shaykh Hail es-Serour (*aesthetic/status Model*) (photo by Bert de Vries).

Serour family home was elaborately constructed solely from basalt blocks and decorative fragments removed and re-cut from the ancient town. In more recent years, a concrete addition has been added creating a striking juxtaposition of old and new (**Fig. 3**). Many of the study participants indicated that the Shaykh's house was an important status symbol and source of pride for the community. One resident put it this way:

"Whenever the most important people come to visit our village, they must see the house of the Sheikh. It is the most beautiful of all the buildings. You know this is true. Where did I take you when you first came to Umm al-Jimāl? It is so beautiful. Don't you agree? It is very expensive to build a house like this. The stones are so heavy and you must pay the Egyptian workers to carry them and to cut the stones. It will cost maybe one million JDs".

None of the participants discussed any negative associations with Umm al-Jimāl villagers transferring objects from the ruins. However, when asked why removal and reuse were so prevalent, two informants said it was done to prevent people from al-Mafraq (the nearest town) from taking 'their' stones.

In addition to concepts of history and tribal identity, and aesthetics and social status, informants also distinguished a third interpretation of the meaning of cultural heritage objects that I have called the *Utilitarian Model*. The ruins of the ancient Umm al-Jimāl are, for some of the poorer members of the community, a source of free and accessible building materials. Homes constructed with mud and rubble can be com-



3. House built by Shaykh Hail es-Serour showing old and new construction (aesthetic/status model). The original basalt house built in the 1960s is on the left and the madhafa addition, which replaced the majlis tent in the 1990s, is on the right. Monumental architectural fragments are visible on the porches (photo by Bert de Vries).

pleted with minimal economic investment and can be distinguished from the method of reuse seen in the Shaykh's house in at least three ways. In the domestic structures occupied by the poorest segments of the population, stones are not recut and refitted for reuse, the homes are generally much smaller, usually consisting of one or two rooms, and the work is carried out by household members and not paid Egyptian laborers (Fig. 4). Participants were quick to distinguish this type of housing reuse from the more aesthetically pleasing construction of the Shaykh's home.

These distinguishable, yet overlapping, models suggest that cultural resources embody a multiplicity of values simultaneously, including those that form links to the past and those that fill immediate material, status, and subsistence needs in the present. From a Western academic perspective, it may be difficult to reconcile these apparently opposed views of the ruins as culturally and historically significant on one hand, and a source of free building material or status items on the other. For example, researchers may discuss this behavior as 'theft',

or at least 'disturbance', of cultural heritage properties. For many archaeologists, a primary goal of research and preservation is to be able to accurately reconstruct and protect ancient structures in as close to their original form as possible. This goal of maintenance or preservation is perceived of as being tied to the ability to assess and interpret the historical and contextual significance of structures. Hence, utilitarian, status / aesthetic, and historical models of archaeological remains may be viewed as contradictory value systems.

Umm al-Jimāl's residents, however, do not interpret or view these models of material culture as inharmonious. In fact, they may view the destruction of *in situ* archaeological remains that inevitably accompanies systematic excavation as contrary to the expressed goals of site interpretation and preservation. From a villager's perspective, reuse of building materials and decorative fragments may simply represent the most recent phase of occupation or period of history at the site, for certainly the ancient inhabitants altered and reused the remains of previous generations.



4. Older, poorer home to the east of Umm al-Jimāl, now used for storage, constructed of stone rubble and spoiled blocks taken as free building material (utilitarian model) (photo by Janet Brashler).

SITE PRESENTATION IN JORDAN: CONCEPT DESIGN AND JANUARY 2009 DOCUMENTATION SEASON AT UMM AL-JIMĀL (B. de Vries, S. de Vries, L. Koning, S. Oord, D. Roukema, M. Workman, P. Christians, J. DeKock, C. Mulder, T. al-Hunaiti, M. al-Fayez, B. Lücke and M. Haza)

### Introduction

During the last two seasons of excavation, the Umm al-Jimāl Project (UJP, 1996 and 1998) developed a site preservation and development plan that proposed the consolidation of key buildings of the Byzantine-Umayyad site (see Dunn 2002), especially the Praetorium, the layout of a signed walking tour and the reversible adaptation of the Umayyad Farm House (House 119) as a Museum Visitor Center (**Fig. 5**) designed by Amjad al-Bataineh (de Vries 1995: 423-433). Several years ago the Department of Antiquities, under the direction of its own architects, began implementing the restoration of Umayyad House 119 and its adaptation as the proposed Museum Visitor Center using this plan in concept, though not its construction details. This process is nearing completion in 2009.

In 2006 a new non-profit organization, Open Hand Studios (OHS), founded by Calvin College graduates to work in partnership “with communities across the world to create hands-on museum exhibits and virtual media that nurture social justice”, adopted the Umm al-Jimāl Project as one of its pilot programs (see [www.openhandstudios.org](http://www.openhandstudios.org)).



5. DoA mason poses against wall of House 119, which is being consolidated as part of the adaptation of the structure as a Museum Visitor Center (photo by Bert de Vries, June 2008).

The objective of the partnership is to present Umm al-Jimāl and all its data and research as a virtual museum linked to the site and presented as a museum in reality. These linked museums will be structured to enable access and engagement of all interested communities, ranging from the local village to the people of Jordan as a whole, and including Jordanian government ministries responsible for antiquities, tourism, cultural heritage and education, academic communities and their agencies in Jordan and around the world, and anyone interested in popular heritage and tourism.

### Inception and Implementation of the Work of the UJP-OHS Partnership

OHS and UJP have worked together since 2007 to complete the long process of digitizing the vast amount of UJP field data for digital structuring and presentation. The new UJP website, [www.ummelJimal.org](http://www.ummelJimal.org) (opened May 2008), functions as a carefully planned ‘museum’ with complexes of wings and rooms which will eventually contain all the Umm al-Jimāl research and site materials ranging from raw data to field reports, publications, photo and other records, project history, site tours and much more. While ‘front’ rooms will present attractive and informative displays, the ‘back’ rooms will contain fully searchable GIS-integrated project data.

To complete the installation of these virtual ‘exhibits’ and ‘store rooms’, new documentation using state-of-the-art equipment and methods was necessary. For example, integration of the real site with the virtual one required the installation of a walking tour on the ground that matches a visually recorded virtual tour on the internet. This tour, designed to be followed and read on location was first published in 1982 for the Department of Antiquities, and then revised for al-Kutba Jordan Guides in 1990 (de Vries 1990: 21-35). To give a realistic rendering of the structures of the site in virtual reality, a photographic regimen for three-dimensional rendering needed to be developed, for which the process and software adaptation was developed by OHS.

In addition, this site documentation enabled connection with at least three of the ‘communities’ listed above. First, the team began docu-

menting the living heritage of the 6000 inhabitants of the village of Umm al-Jimāl (Fig. 6), both to reconnect it historically with the antiquities, and to make it a ‘stake-holder’ in the hosting of visitors and management of liaison between Umm al-Jimāl and the rest of the world. The creation of archaeological educational curriculum for Umm al-Jimāl was planned, in order to promote intellectual appreciation at all levels from local to international, and from popular to academic. Bringing a team of documentation and museum specialists to the site also satisfied the interests of the Department of Antiquities of Jordan (DoA) in two ways. First, computer technicians in the DoA joined the team working on three-dimensional photographic rendering of structures. Second, the field team and DoA staff began working together on the design and installation of the museum on the ground.

Thus, the documentation field work done in January 2009 functioned as a four-way partnership between the Department of Antiquities of Jordan, the Umm al-Jimal Municipality, Open Hand Studios and the Umm al-Jimāl Project, with adjunct participation by Jordan’s Ministry of Education, Calvin College and the American Center of Oriental Research (ACOR). All this will continue into the indefinite future both in Jordan and at Calvin College, and will include a second documentation season in January 2010.

### Documentation of Ruins and People at Umm al-Jimāl in January 2009

The goal of the multifaceted January 2009 season was to gather documentation for the site presentation program described above. As diverse as the potential audience, the team members came from Calvin College (Grand Rapids, Michigan), Open Hand Studios (Chicago, Il-

inois), the Department of Antiquities (Jordan) and the village of Umm al-Jimāl itself. The central goals for the team’s work included:

1. Museums: Creation of Umm al-Jimal Virtual Museum, interfaced with Umm al-Jimal in reality (Museum-On-The-Ground).
2. Heritage: Gathering data in the living village for integration into the antiquities of Umm al-Jimāl, thereby working towards the goal of establishing the site as a southern Hauran cultural center.
3. Environment: Sampling historic soils as part of Jordan-wide research into ancient soils and documentation of modern ecology.

To achieve these goals the project staff was divided into six teams, each with their own areas of specialized expertise:

*The Video Production Team*, led by Jeff DeKock (OHS), documented the entire site in film and still photography and filmed numerous interviews with experts (Fig. 7) and local heritage interviewees. Jeff De Kock reports:

The video production team’s principal goal was to document the Umm al-Jimāl site in both



7. Jeff DeKock (OHS), Abdelsami‘ Abu Daya (DoA), Paul Christians (OHS) and Rafe Harahsheh (DoA, project liaison) after Mr Abu Daya was interviewed on World Heritage Site qualifications (photo by Bert de Vries).



6. View across water-filled Roman reservoir, May 2009, and Byzantine houses towards the north-west sector of the modern village. The picture demonstrates the extreme proximity of the residents to the antiquities and the interconnection symbolized by the way the ancient water system is serving the modern community (photo by Bert de Vries).

still photography and video imagery. Nearly 100% of the Byzantine site was covered. Images were captured of every remaining building, with additional film work focusing on all of the major sections of the site including construction techniques, inscriptions, the water system, home life, religion and city planning. Images were framed aesthetically and did not include a meter stick or any other scientific measures. Second, the team did the visual documentation for the Umm al-Jimāl heritage interviews of Umm al-Jimāl residents in their homes. Third, the team filmed various interviews with experts on the site, including members of the Department of Antiquities, the site Director, and other experts working on specific projects dealing with geology, heritage preservation and site presentation. Fourth, the team visually documented the work being done by the other team members in order to produce a video that explains what digital heritage preservation is, and how it is being done at Umm al-Jimāl. Fifth, the team filmed a brief tour of the site in Three Dimensional Film. Sixth, the team took a series of High Dynamic Range Photography of the site. Finally, all of this visual data was logged into the project database. Every shot, both still and video, is fully documented and searchable under multiple categories. The video team achieved the majority of its goals and has collected a vast array of data that will be used to produce a series of films, supporting visual material for various articles, and web content in the coming years.

*The Virtual Museum and Site Development Team*, led by Paul Christians (OHS), created a visual tour of the site using elaborate photography techniques, developed the script and signage for such a tour (**Fig. 8**), and is developing the design for the installation of the site museum and walking tour on the ground.

Paul Christians reports:

Data recording for all objectives was completed on schedule during the project's allotted work time. Staff created a finished map of POIs for the walking tour, as well as an accompanying detailed outline for eventual creation of specific sign text to be installed along Umm al-Jimāl's main guest pathway. Panoramic photography for each POI was captured for subsequent stitching into a series of linked, interactive, 360° by 360° images accompanied by audio to match the site's physical signage. All objects in al-Mafraq DoA office were digital documented in QTVR object photography, 3D stereo pair photography, still photography and in text. Objects are planned to be integrated into an online, museum-style exhibition. Both the virtual tour and object exhibit will be published primarily through the project's official web site, [www.ummelJimal.org](http://www.ummelJimal.org). However, museum work during the 2009 study season at Umm al-Jimāl is envisioned to contribute not only to public knowledge of ancient Umm al-Jimāl, but to facilitate existing academic research and ongoing preservation efforts. In the same vein, this season's efforts will also form an open-access digital complement to related



8. *View of double window and east rooms of House XVIII at sunrise—a key stop on the tour (photo by Bert de Vries).*

project components such as the on-site museum (under construction at House 119) and proposed community cultural heritage center.

*The Virtual Reconstruction Team*, led by Craig Mulder (OHS), did photogrammetric field documentation for the three dimensional portrayal of two buildings, the Umayyad House (by DoA experts Tawfiq al-Hunaiti and Mowafaq al-Fayez), which is to serve as the new Museum Visitor Center, and the Cathedral (by OHS-UJP staff; **Fig. 9**). Craig Mulder reports:

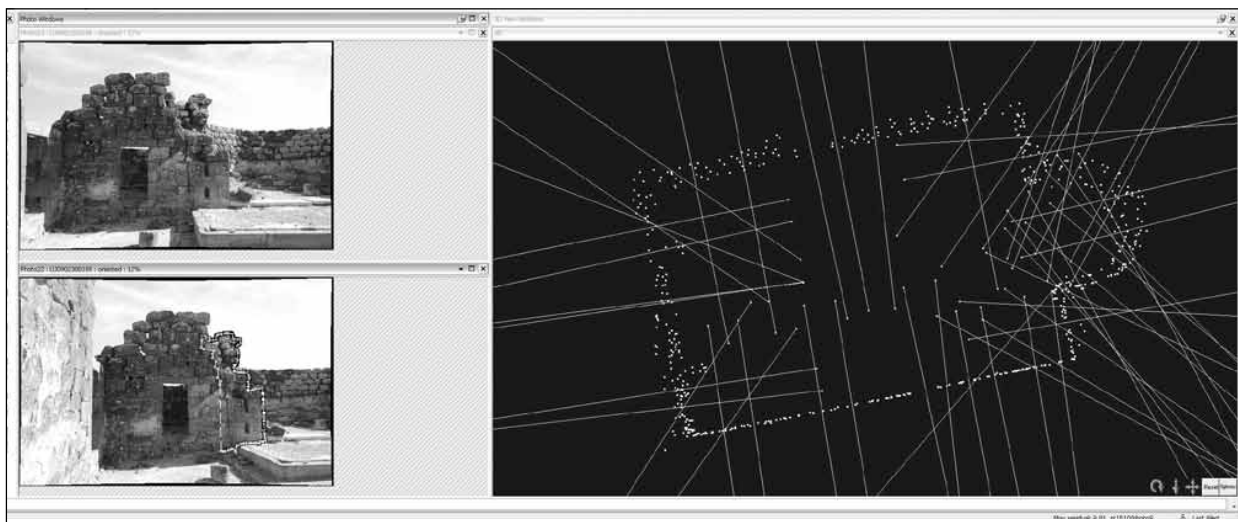
The main objective for our team was to develop a repeatable process for documenting the existing ruins using photogrammetry software. The software, PhotoModeler Scanner, uses photographs to accurately recreate virtual 3D surfaces that have the same texture and shape as the original. Achieving this reconstruction objective involved several sub objectives that must be met. First, the UJ09 staff and students needed to be trained on the software and in the use of the cameras and photography equipment. Additionally, since the UJ09 season was run in partnership with the Jordanian Department of Antiquities, the DoA engineers that were assigned to the project also needed to be trained in the same way. Once the training was completed, the DoA engineers and UJ09 staff and students developed a common practice for taking correct photos and using the software.

After this the two teams began to photograph

the site. Each team focused on an individual building -- the DoA engineers took the Museum and the UJ09 team started with the Cathedral. This process is also applicable to small objects and inscriptions, but the teams each decided to start with a building as it would be the most complex and strenuous test of their skills. The student team completed the reconstruction of the interior walls of the Cathedral, and the DoA team several sections of the exterior of the Museum. The output of these buildings (to be completed in 2009) will be used as Surface Documentation and also in other programs to create a immersive panoramic environment that will be posted on the Umm al-Jimāl Archaeology Project website. This digital reconstruction will recreate the site with this software so that it can be viewed as it currently looks over a broadband internet connection. This is also the first step toward recreating ancient Umm al-Jimāl as it would have looked during its height in the Byzantine era.

*The Modern Cultural Heritage Team*, led by Sally de Vries (UJP) documented the tent and house occupation of the ancient site during the past century and conducted interviews with numerous members of the community to document their remembered heritage (**Fig. 10**). Sally de Vries reports:

The goal of the heritage team was to do oral and visual documentation of the culture of the



9. Screen shot with plan of the Cathedral showing the camera positions and directions for stereoscopic imaging of the interior walls.



10. Sally de Vries and Calvin College students with heritage interviewee in heated tent.

modern village of Umm al-Jimāl, inhabited mostly by about 6000 members of the Masa'id tribe, but also some others, including at least one Druze family. To achieve this, a number of interviews were conducted on location in homes, in family tents and in the fields among the animals. The interviews were recorded by the Video Production team and are being edited and transcribed over the course of 2009. Goals of the heritage documentation included recording: (1) memories of life in the ruins during the first half of the 20th century and the resettlement into the modern community, (2) awareness of traditional culture, including customs like use of henna, material goods like household implements and crafts like weaving, (3) reflections on life today, especially family life, including household economy and gender matters. That these interviews were conducted with the blessing of the municipality and the willingness of interviewees is itself testimony of the close relationship between the community, the project and the antiquities. On the archaeological side, the numerous tent sites remaining from Masa'id life in the antiquities were mapped, photographed and described.

The interviews will continue next year, and comprehensive reporting of results will only be possible after transcription and thorough analysis. For now, a brief summary of a successful interview with a lady who estimates her own age at 91 will serve as a sample:

*"She described living in the ruins (west of the Barracks) back in 1930 when she was twelve years old and said that in an ideal world she would still live there. She was married at 30 years old and the wedding ceremony was three days and three nights. Her husband was part of the first military in Jordan. At about age 13 a gypsy woman from Syria used a needle and ink in ash to permanently color her facial skin. She went on to describe her tattoos as a symbol of beauty and anyone that did not have tattoos was not considered beautiful. She would not do the tattoos today because they are against her religion but in those days her tribal community was less conscious of that. She was nostalgic of the past because back then the Bedouin valued community and trade and now people tend more to themselves. People were more dependent on each other than they are in the present. She went into great detail explaining how she made a tent out of goat hair, a craft still practiced today"* 1/8/2009.

*The Educational Curriculum Team, led by Sarah Oord and Mary Workman (Calvin College education majors) developed a multi-disciplinary strategy for the teaching of archaeology to Jordanians in primary and secondary schools. Based on that, they developed thirteen lesson plans using the archaeology of Umm al-Jimāl and formulated a proposal to the Ministry of Education for integration of archaeology into the*





11. Education and Heritage Teams listen to Muaffaq Haza explain a Masa'id tent site from the 1950s inside the ruins (photo by Bert de Vries).

national curriculum (**Fig. 11**). Sarah Oord and Mary Workman report:

Educational theory. Our approach to teaching archaeology has three facets: (1) multi-disciplinary arrangement of topics so that lessons can be used in all parts of the school curriculum rather than just social studies, (2) starting with the familiar, like introducing the children of Umm al-Jimāl to the ruins of their own village, and (3) grading the material by developing model lesson plans at three grouped age grade levels, the primary, middle and secondary grades.

Curriculum development. To prepare ourselves we conducted research via site tours led by Bert de Vries, reading from "Umm al-Jimal: A Frontier Town and Its Landscape in Northern Jordan" by Bert de Vries. We also attended many interviews with a variety of people throughout the current town of Umm al-Jimāl. In particular we interviewed teachers and students to obtain information about the schools in Jordan, particular focus being given to the regional area, and how schools operate. The knowledge acquired through these processes then helped in the creation of lesson plans. Thus prepared, we wrote thirteen lesson plans which ranged across the disciplines including, amongst others sociology (how children lived), archaeology (pottery, architecture), biology and health (skeletal remains), environment, trade (objects and food products), physics and geology (properties of basalt), diet (agriculture) engineering (water), and more.

Teaching Umm al-Jimāl in Jordan. On a visit to

the Ministry of Education in Amman the team was hosted by the Under-Secretary, Toujan Bermaret. At her invitation, we submitted a proposal on curricular development for the teaching of archaeology in Jordanian schools to the Minister. This was subsequently accepted and we are now editing the documents we prepared in partnership with the Ministry, working with the head of curriculum in Amman and the director of the al-Mafraq Department of Education.

*The Historical Ecology Team*, led by Bernhard Lücke (German-Jordanian University) and Laurie Koning (Calvin College graduate in geology) took samples of ancient soils for laboratory analysis in order to study the ancient climate patterns and agricultural adaptation of the various communities inhabiting Umm al-Jimāl from past to present. These samples were collected from four strategically chosen locations, two in former excavation trenches inside the walled site, one from a former trench in Area R (al-Hirri) and one from an agricultural field to the south of al-Hirri. This study will form part of Professor Lücke's comprehensive sampling and analysis of paleo-soils over two huge transects running west-east across Jordan and north-south across Syria and Jordan. Laurie Koning is analyzing these samples in preparation for writing her MA thesis on Umm al-Jimāl's paleo-soils at Brandenburg Technical University.

### Conclusion

Expected results of the work include imagi-

native, attractive and educational site presentations to be posted both on the internet ([www.ummeJimal.org](http://www.ummeJimal.org)) and installed on the ground, thereby enabling both virtual and actual visits. Director Bert de Vries and his talented collaborators consider this thorough and multi-tiered site presentation structure to be a potential model for other sites in Jordan and elsewhere. We view the results as a step towards the overarching goal of providing a structure that enables equal, open and fair access to antiquities sites and the information based on them. Our model of multiple intersecting partnerships also serves to facilitate the just implementation of that goal within the normal strictures of local, national and international civic societies.

### Credits

The field work was funded by Calvin College (field school) and the Norwegian Research Council (Global Moments in the Levant collaborative research), and received strong support from its project partners, the Department of Antiquities of Jordan and Open Hand Studios. In addition to the core staff listed above, expressions of deep gratitude are due to Dr Fawwaz al-Khrayshah (DoA Director General) for his gracious enablement of our partnership, Muaffaq Haza (long-time UJP team member) for his tireless local arrangements and community coordination, David Roukema for his coordination of activities, organization of data and editorial assistance, Saleh Fallah (Mayor of Umm al-Jimal Municipality) for his visionary blending of the heritage dream and economic practicality (**Fig. 12**), and the entire ACOR staff for its encouragement of our vision and enabling of our work. We're also grateful to Sultan es-Serour for allowing us to use his father Shaykh Hail's house for our 'camp' and its great *madhafa* for our communal computer lab, living room and lecture hall.



12. *The Umm al-Jimal Municipality offices seen from the ruins, with the ancient basalt stones and antiquities perimeter fence in the foreground emphasizing the close proximity of the two spheres of governance (photo by Bert de Vries).*

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### Bibliography

- De Vries, B.  
1990 *Umm el-Jimal: "Gem of the Black Desert". A Brief Guide to the Antiquities*. Second Revised Edition. Amman: Al Kutba, Publishers.  
1994 Restoration at Umm el-Jimal. Pp. 45-52 in Luigi Marino (ed.), *Site e Monument! della Giordania*. Florence: Alinea Editrice.  
1995 The 1993 and 1994 Seasons at Umm el-Jimal. *ADAJ* 39: 421-435.
- De Vries, B., Bataneh, A. and Dunn, E.  
1996 Proposed Development of the Umm el-Jimal Archaeological Park. Unpublished Field Report.
- Dunn, E.A.  
2002 A Case Study of Ancient Mortars and Concretes from Umm al-Jimal, Jordan, with Implications for Archaeological Site Conservation. Ph.D. Dissertation. Duluth: University of Minnesota.