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J. Basil Hennessy A.O. 1925–2013

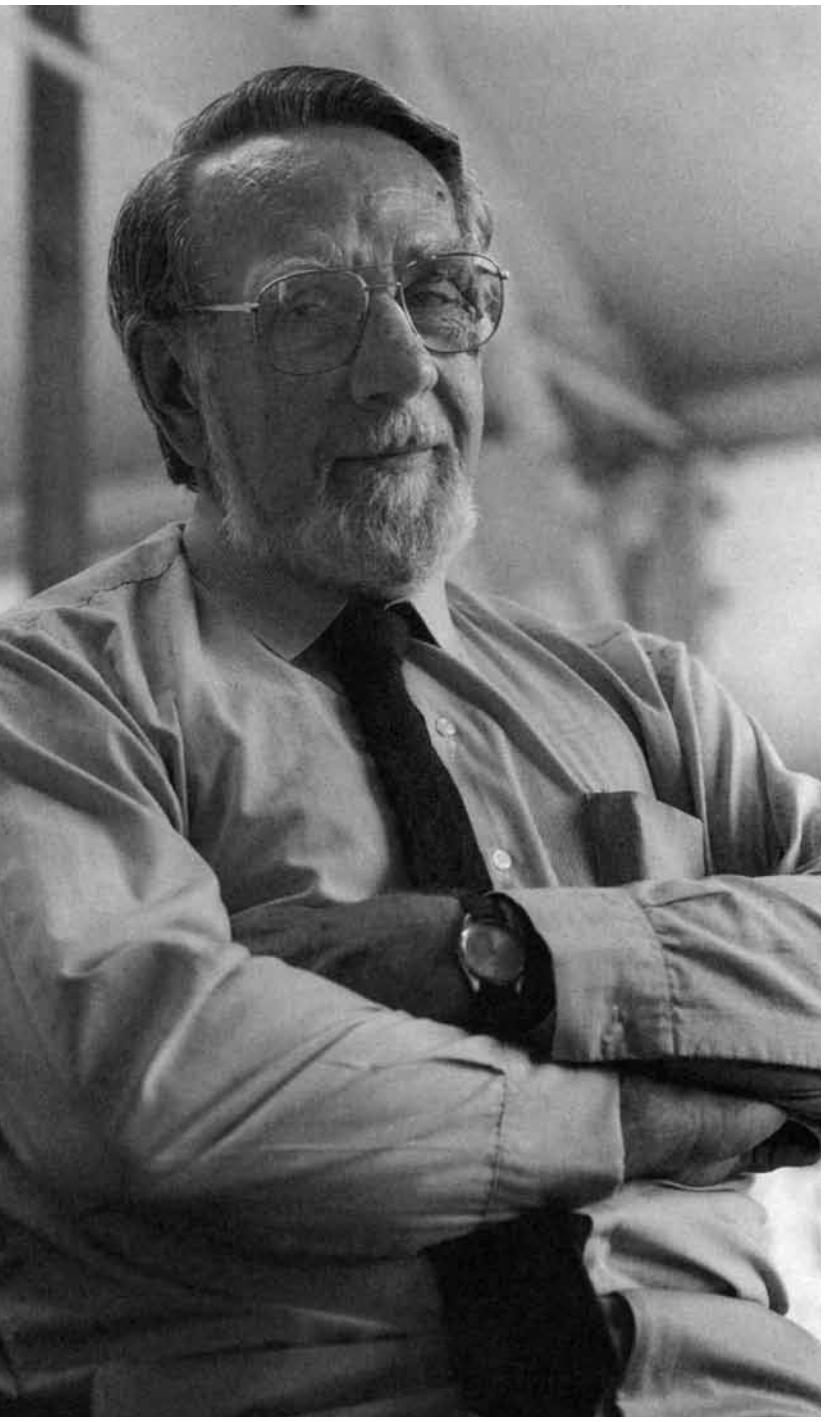
by Stephen Bourke

J. Basil Hennessy, founding Director of the Near Eastern Archaeology Foundation (1986–91), and second Edwin Cuthbert Hall Professor of Middle Eastern Archaeology at the University of Sydney (1973–90), died peacefully in Goulburn on 27 October, aged 88. Hennessy was the pre-eminent Middle Eastern archaeologist in Australia for more than twenty years, and most prominent fieldworkers today were either taught by, or worked with him. The historic prominence of Australian scholars within the field of Middle Eastern archaeology is to a great extent the result of his influence and actions.

Hennessy was born in Horsham Victoria, in February 1925, the eldest son of Thomas Hennessy and his wife Nell (*nee* Poultney). He was educated at Villa Maria and St. Patrick's College in nearby Ballarat. Joining the Australian navy at 17, he saw war service in New Guinea and Darwin (1943-45), before enrolling in Anthropology at the University of Sydney in 1947. At that time, Archaeology was not taught at Sydney, and when courses began under Dale Trendall and Jim Stewart in 1948, Hennessy was among the first to enrol, gaining Honours in Archaeology in 1950 under Stewart, the major influence on his early career.

After graduation, Hennessy embarked on an extended research trip across the Middle East, ending up in Ankara, where he accepted a British School studentship to work alongside such luminaries as James Mellaart and Seton Lloyd. In mid 1951, with backing from Australian private supporters, Stewart brokered Hennessy's first fieldwork in northwest Cyprus, as part of the Ashmolean Museum-sponsored Myrtou Pighades project. Working under Joan du Plat Taylour's tutelage, Hennessy undertook salvage work in the Roman period cemetery at Sphagion, before embarking on the much larger excavation of the Bronze Age cemetery at Stephania, which formed the subject of his first book.

A journey to the Levant late in 1951, to join Kathleen Kenyon's first season of excavations at Jericho, was to be the formative act of Hennessy's archaeological career. Thereafter he became Kenyon's student and ultimately life-long colleague. At Jericho Hennessy worked on the Early Bronze Age (4th/3rd Millennium BCE) strata, which later formed the heart of his Oxford D.Phil and his second book (1967). While working at Jericho, under Kenyon's questioning, he began to ponder the origins of the EBA culture, which in due course led him to propose new



Basil Hennessy in 1994. Photo by Russell Workman.
***Cover photo** shows Basil excavating Roman period Tomb 39 at Pella in Jordan.*

excavations at the nearby Chalcolithic period (5th/4th Millennium BCE) type-site of Teleilat Ghassul.

Hennessy returned to Australia in 1953, married Ruth Shannon in 1954, and settled into life at Sydney University, first as Temporary Lecturer (1954–57) and then in a permanent position (1958–61). During that time a first generation of Australian fieldworkers, including Kay Wright (later Prag), David O'Conner and Robert Merrillees, were inducted into the mysteries of Middle Eastern archaeology. During this time, Stewart supervised Hennessy's work-up of the Stephania excavations into a monograph length study (1964), still highly regarded fifty years after publication. However, although Hennessy remained actively engaged with Cypriot archaeology, his interests had broadened under Kenyon's tutelage, and when she suggested he come to Oxford to undertake Doctoral work on the Jericho EBA, he resigned from Sydney, and moved there with his young family. His D.Phil on the Foreign Relations of the Levantine EBA (1962–64), when published in 1967, was quickly recognized as one of the seminal works on the period, and is still cited regularly today.

After completing postgraduate study, Hennessy was appointed first Assistant and then Deputy Director of the British School at Jerusalem (1965), before becoming Director in 1966, a post he held for five years. During this time, he became responsible for the long-term excavations at the Damascus Gate (1964-66), undertook rescue work at the Amman Airport temple (1966), launched what were planned as long-term excavations at the key Chalcolithic site of Teleilat Ghassul, disrupted after one season (1967), and began exploratory work at Samaria, also soon suspended (1968).

The Jerusalem days were an important influence on Hennessy's subsequent career, as it was here that he became thoroughly acquainted with the archaeology of Jordan, and forged close ties with the Jordanian Department of Antiquities. Here too, he made many of his life-long professional friendships (including that of a young Anthony McNicoll), as the numerous scholars working from the British, American and French schools became close partners in the exploration of the Biblical world, sharing staff and students across the many large-scale field projects then at work. However, gradually changing circumstances after the Arab-Israeli war of 1967 restricted freedom of movement and association, and Hennessy left the British School in 1970 to return to Australia. The Edwin Cuthbert Hall Chair of Middle Eastern Archaeology, first held by Jim Stewart in 1960, had remained unfilled after the latter's sudden death in 1962. Hennessy returned to became Visiting Professor (1970-72), but the Chair was only fully restored when Hennessy was appointed permanently in 1973, a position he then held until his retirement at the end of 1990.

When Hennessy returned to Sydney in 1970, Middle Eastern archaeology had not been taught for nearly a decade, and he set about creating vibrant courses in Levantine, Anatolian, Mesopotamian and Egyptian archaeology, supported in this project by Anthony McNicoll, who was appointed to the position of Lecturer in 1976, with Hennessy's active encouragement. McNicoll's interests in the Classical and Late Antique Middle East complemented nicely Hennessy's concern for Prehistory and the Bronze and Iron Ages.

With the encouragement of Yacoub Oweis, Director-General of the Jordanian Department of Antiquities, and much on-ground support by Jordanian military authorities, fieldwork was able to resume at Teleilat

Ghassul in September 1975, with Hennessy leading the first large-scale Australian-sponsored excavations in the Middle East. His main aim was to document the origins of the Ghassulian culture, and to track its development over a millennium of continuous occupation. Over three field seasons (1975–1977), he demonstrated the indigenous roots of the Ghassulian in the local Late Neolithic, excavated the first cultic complex found within a Chalcolithic settlement, and discovered and had conserved the famous "Processional" wall painting, arguably the most spectacular of all the frescoes for which Ghassul is justly famed.

Important though his renewed work at Ghassul was, it still concerned what Hennessy demonstrated to be essentially a single-period settlement, albeit one that had enjoyed a millennium long history. Hennessy wanted to develop long-term, cross-cultural, comparative archaeology at Sydney, and to underpin this endeavour he desired a more wide-ranging field project. To this end, in discussions with the Jordanian authorities, he had been seeking a multi-period settlement, containing both deep prehistory and a full Classical/Late Antique sequence, so that he and McNicoll might work together, developing themes of comparison across the ages.

The ideal site became available when Bob Smith, of Wooster College Ohio, decided to re-open excavations at Pella (modern Tabaqat Fahl) in the north Jordan Valley, which had been in abeyance since the 1967 war. Bob needed a partner-investigator, as the rising costs of a major field programme could not be sustained by Wooster alone. Hennessy and McNicoll visited the site in February 1977, and after securing the enthusiastic cooperation of Adnan Hadidi, Director-General of the Jordanian Department of Antiquities, the joint Sydney-Wooster expedition returned to Pella in early 1979.

Pella proved to be everything Hennessy had wished for. Its long, largely unbroken occupational sequence, spanning the Neolithic (ca. 6500 BCE) through to the later Medieval (ca. 1450 CE) periods, would allow an entire generation of young Australian researchers to develop their post-graduate interests from the widest array of carefully excavated assemblages. The site's wealth of data, combined with Hennessy's abilities as both teacher and inspirational leader, generous with both his knowledge and access to archaeological materials, eventually formed the core of more than twenty Doctoral theses.

In addition, the ancient cemeteries surrounding Pella proved rich in grave goods, which through a generous Jordanian policy of finds-allocation, eventually came to enrich all major museums of antiquity in Australia. Hennessy believed that such teaching collections were absolutely vital for the appropriate instruction of Australian students, who were, for the most part, based far from the major museums of Europe and the Middle East. Very much a 'hands-on' teacher, he insisted that students learned to describe and identify accurately a very wide range of archaeological materials. Conversations on research endeavours were apt to leave Hennessy's students with a feeling of deep inadequacy, but upon entering the wider world they found that they could hold their own internationally, which was, of course, the point of the exercise.

As well as the strictly academic endeavours of teaching and fieldwork, Hennessy was the founding Director (1986-91) of the Near Eastern Archaeology Foundation at Sydney University, now Australia's leading outreach organization for Middle Eastern archaeology. Hennessy understood the importance of communicating the results of publically funded fieldwork to the widest possible audience. In the days before the internet, this meant a punishing schedule of extracurricular public lecturing across Australia. Hennessy was a warm and engaging communicator, and the public responded to his obvious enthusiasm for the work at hand. Under his initial guidance, and with on-going in-kind and financial sponsorship, NEAF flourishes to this day, organizing public lectures and study days, developing archaeological tours, bringing visiting scholars to Australia, and (most importantly) offering generous annual grants to Australasian postgraduate students of Middle Eastern archaeology.

It had been Hennessy's plan to retire early, and devote his last productive years to his own publication backlog, and to deal with Stewart's last excavations in Cyprus, which it fell to him to complete. Alas, McNicoll's sudden death in 1985 de-railed many carefully laid plans, and Hennessy was forced to discard all thoughts of retirement. As a result, he maintained until 1990 (his 66th year), a full teaching load at Sydney, while continuing each year in the field at Pella.

Hennessy's many achievements were recognized by the Australian government in 1990, through the award of an Order of Australia for services to Archaeology and Foreign Relations, and as well by the University of Sydney via an Honorary Doctorate of Letters in 1993 and the Centenary Medal in 2001. In retirement, Hennessy counselled former students who continued work at Pella and Ghassul, supporting those who wished to branch out in new directions, and encouraged others to work on his (and Stewart's) publication backlog. The work continues to this day, and the enthusiasm and loyalty that Hennessy engendered will surely see it through to a triumphant completion. In many ways, Hennessy proved to be the father of Middle Eastern archaeology in Australia. Stewart's profound early influence and Kenyon's long-term support combined to produce a scholar of exceptional breadth and depth. An inspirational teacher, both in the classroom and the field, and a kind and gentle man, full of laughter, wisdom and tolerance, his ability to impart the sheer excitement of discovery, and his gift for warm fellowship down the years, has ensured that he will have many academic successors in Australia and beyond. However, the wide-ranging impact of his achievements is unlikely to be equalled, now or in the future. As the years go by, his absence will be ever more deeply felt. □

News from Southern Jordan

by Michele Cotton

As I walk past little Ayla, the earthquake fractured fortified town whose history extends back to Nabatean times and which now sits in the centre of Aqaba, I am reminded of the past, the present and the future.

I look across the Red Sea into the hazy blue distance at the mountains and Eilat draped over the lower slopes and reaching down to the sea. With Sinai to my left I give thanks again for this opportunity to live and work in Jordan for the past 18 months.

Being immersed in this culture has been every bit as constructive as I had hoped. Combining my love of the region with a chance to apply some of my own lifelong training as a veterinarian is pretty well the job of a lifetime.

The challenges for everyone living here are many. My long term interest in the concept of "One Health" enables me to look at the health and welfare of both the people and their animals. This is where the past comes in. I reflect and try to learn how the Bedouin have been living with the animals for millennia. Helping the local private vet and the ministry of Agriculture officers, plus being free to roam the special enclosure where the oryx are kept brings the bigger picture, the environment, into focus.

I enjoy looking at the many inscriptions on the rock walls surrounding my desert "office" and think about how important animals have been to the people here. The paintings and carvings tell stories of the times when animals meant life or death for the inhabitants.

Many animals are depicted, some which I have had a chance to try to interpret include Ibex (the majority), Oryx, lions, Aurox, ostrich, the odd leopard and of course camels. I see pictures of people armed with spears and arrows and wonder if they were hunters or warriors or both. The past is ever present and animals have been an integral part of man's occupation of this area. I am just as curious to know why there seem to be no inscriptions of the smaller animals that must have made up part of man's diet, the lizards and smaller birds. Can the Archaeologists tell me?

What of the future?

Increasing population, pressure from outside countries in crisis, increasing desire of locals to keep larger herds of animals, here it is mostly sheep, goats and camels, cropping and using irrigation from ancient aquifers all exact a price from the delicate landscape.

People here are justifiably puzzled as to why they can no longer subsist off the desert; the pressure on communities grows daily.

The Bedouin, traditional nomads, find themselves less able to move to areas that are more sustainable as the seasons occur. Likewise the Oryx, a nomadic beast that used to range thousands of kilometres feel that staying in one place is not good for anyone's health. The Oryx are in an artificial situation here. Their extinction in the wild in 1976 ensured that captive breeding from a limited gene pool was their only hope. To give credit to the people in USA, UAE, Oman, Saudi Arabia, Israel and Jordan the survival of the species has been ensured. Only widespread disease will kill them now, yet with unrest in the region they are also at risk.

The author at Wadi Rum, Jordan.

And now the Present:

When I am able to spend my days out in the 1,600ha Wadi Rumman, set aside for the captive breeding of the 50-strong herd of Arabian Oryx (*Oryx leucoryx*) I am able to get a feel for how it used to be. As well as rock inscriptions and drawings there are the foundations and remains of cave dwellings and caches, small graveyards and rock tumuli, some old and not so old perhaps. I don't see pictures of wolves, yet I see many wolf tracks, and wolf bites on the living oryx occasionally. Wolves must have been present here too, unless their populations have been brought closer to human habitations again through environmental pressure and loss of wild food sources.

We are about to receive a consignment of 200 Ibex from the captive breeding herds of UAE. Already in the surrounding hills, as evidenced by our motion sensor cameras strategically placed at water holes for the oryx, we see that quite a few Ibex already live here. They are hunted by the locals and as a result are very hard to see in daylight hours.

The hope is that extension of the restricted area might provide a refuge for these animals, so people can see both living and ancient evidence of what used to be here.

With the first rain of the season falling today I am looking forward to indulging in yet another interest. Botany. Living here has been a pleasure and a great privilege, I would like to think that some of the small things I have managed to do may help in planning and managing the future of this wonderful region. ☐

"A nation stays alive when its culture stays alive"

A report from the Kabul Museum

by Jamie Fraser

In August 2000 the National Museum of Afghanistan opened its doors for three days after its decade-long closure during the civil war and the Taliban regime that followed. Journalist Luke Harding was one of the few westerners in Kabul at that time. "There is not much left to see inside the Kabul Museum these days", he wrote, "almost everything from the collection has gone: the ivory panels of frolicking half-naked courtesans, the recumbent Buddhas, and the Greek coins. Not only did Afghanistan's civil war claim 1.5 million lives, it also swallowed up the country's history."

The destruction of the Kabul Museum is one of the great tragedies of Middle Eastern archaeology. By the time the Soviet Army invaded in 1979, the museum had grown from a small "Cabinet of Curiosities" to one of the largest repositories of Central Asian antiquities in the world. Its collection included lapis jewellry from the Harappan colony at Shortugai, statues of Herakles from Alexander's outpost at Ai Khanoum and exquisite ivory carvings from the early Buddhist fortress at Begram. To wander its halls was to witness the rise of early civilizations, the reach of empires and the movement of religions along the Silk Road over the last 8,000 years.

The National Museum weathered the Russian occupation largely unscathed, although a provincial museum near Jalalabad was plundered and burned in 1981. The withdrawal of Soviet troops in 1989, however, left a power vacuum that was soon filled by warring factions of mujahedeen. Looting in the Nation Museum began in 1993, when the museum found itself on the front line of a bloody civil war. The collection was pillaged repeatedly each time the museum changed hands. A rocket hit the roof and burned the second floor where the Islamic collection was housed; the ground floor was left strewn with rubble and smashed objects, its shelves empty and cases bare. In 1994 the UN weather-proofed the upper floor and bricked up the windows, yet still the looting continued.

The looting declined when the Taliban captured the city in September 1996, perhaps partly due to the Taliban's practice of amputating the hands of thieves in Kabul's football stadium. For a while it appeared that the museum's fortunes had turned. The new Ministry of Information and Culture allowed the staff to return to work and assess the damage. In 1999, Mullah Omar, Head of the Supreme Council, issued a decree protecting Afghanistan's cultural heritage, and making the smuggling of antiquities and illicit excavation of sites punishable by law. It was the Taliban themselves who opened the museum for those three days in August 2000. "We would like international visitors to see our war-torn country" the Taliban's Deputy Cultural Minister had said.

The front doors of the National Museum of Afghanistan in 2003. (courtesy of Prof. Alison Betts and the University of Sydney Central Asia Program).

The reprieve was short-lived. In February 2001 Mullah Omar reversed his edict and gave the extremist element free reign to dynamite the monumental Buddhas at Bamiyan. A week later Taliban policemen entered the museum and spent several days smashing over 2,500 artefacts that had survived the civil war, including several wooden, animist sculptures from Nuristan, a small province in eastern Afghanistan that had resisted Islam until the end of the 19th century. By the time the American-led forces had chased the Taliban from Kabul in October, an estimated 70% of the collection was missing (over 70,000 items), and 90% of the museum's records destroyed.

Since then, the dedicated museum staff, assisted by a multitude of international agencies, has managed to transform this familiar story of disaster into one of regrowth. The museum was re-roofed, refurbished and, in 2004, reopened by Dr Omara Khan Massoudi, the museum's director who had resigned in 2001 in protest of the Taliban's actions. Many artefacts destroyed by the Taliban or damaged in the fighting have been painstakingly restored. Over 8,000 looted artefacts have been returned, either donated by collectors or seized by border police. Several new galleries have been opened, including a gallery devoted to 843 artefacts seized by British customs and

The National Museum in December 2013.

returned to Afghanistan by the British Museum in 2012. Indeed, the collection continues to swell as it receives artefacts discovered during the ongoing excavations at Mes Aynak, a 2nd–7th century Buddhist site 30km south of Kabul.

Yet while several projects have catalogued select groups of artefacts within the museum's collection, the collection itself has never been inventoried in its entirety. In 2012, the US Embassy in Kabul awarded a major 3-year grant to the Oriental Institute of the University of Chicago to partner with the National Museum of Afghanistan to complete this significant objective. The project commenced in May 2012, and, in September last year, I found myself in Kabul as the newest member of the team.

Working closely with the museum staff, Michael Fisher (the in-field director), Catherine Heim (a project registrar) and myself (a second registrar) spend our days in the museum's storerooms opening crates and trunks that were packed when the museum was provisionally re-ordered in the early 2000s. Each day brings something different: decorated Bronze Age vessels; Buddhist sculptural reliefs; elaborately glazed Islamic tiles. With the museum curators, we enter as much information as possible into a bilingual English/Dari database, including each artefact's provenance, its date, and a preliminary conservation assessment. Each artefact is then photographed and re-housed in acid-free archival boxes. The project recently inventoried its 20,000th object—a significant milestone—and we will remain in Kabul until the entire collection is catalogued, hopefully within the next 18 months.

Yet ironically some of the most prized pieces in the museum's collection are currently in Australia. In 2003 a cache of gold jewellery and other precious artefacts from Tillya Tepe was discovered untouched in the vaults beneath the Presidential Palace, where Mr Massoudi and his colleagues had hidden it shortly before the Soviet withdrawal. Many of these artefacts are touring the world in the *Hidden Treasures of Afghanistan* exhibition, and will be on display in the Art Gallery of NSW from 6 March to 1 June, 2014. This exhibition is a striking embodiment of a statement chiselled into a plinth that stands outside the museum's front doors: "*a nation stays alive when its culture stays alive*". Although Afghanistan faces an uncertain future, the fact that these doors have remained open for a decade is truly a remarkable achievement. ☐

A modelled plaster head of a Buddha, 2nd–4th centuries CE.

A bronze incense burner from Ghazni, 12th century CE.

The Earliest Village People

Past work and future prospects at the Natufian site of Wadi Hammeh 27

by Phillip C. Edwards, La Trobe University

This review of work at the 14,000-year-old settlement of Wadi Hammeh 27, located near Pella in Jordan, appears at a pivotal stage in the site's investigation. The final publication of the 1983–1990 excavations, carried out under the aegis of the Pella project, appeared in 2013 (*Wadi Hammeh 27: an Early Natufian settlement at Pella in Jordan*, Brill, Leiden). Concurrently, the award of a three-year Australian Research Council Discovery Grant to the author and several colleagues has enabled the emergence of a new project associated with Wadi Hammeh 27, entitled 'Ice Age Villagers of the Levant: sedentism and social connections in the Natufian period.' Wadi Hammeh 27 is an exemplar of the Natufian culture (13,000–10,300 BCE) which represents the culmination of the age-old way of hunting and gathering but also foreshadows elements of the first farming societies. At Wadi Hammeh 27 we find the first stone huts, under which people buried their dead kinfolk. Cereals and other food plants were harvested there with sickles and processed with exquisitely-made basalt mortars and pestles, and a new tradition of producing images in stone and bone emerged. Yet, the Natufian culture remains enigmatic due to its transitional nature and because it has few, if any, modern ethnographic analogues.

The present time also marks the passing of J. Basil Hennessy, the founder of Australian work at Pella and the most significant figure in the establishment of Australian archaeological research in the Middle East. Basil implemented the investigations at Wadi Hammeh 27 and acted as my doctoral supervisor during the excavation of this and other prehistoric sites in Wadi al-Hammeh. Ultimately, the younger generations of Australians who work in the

Levant, in whatever period, owe their careers and pastimes to Basil and his vision. Thirty years on, Wadi Hammeh 27 stands as one of the most spectacular sites of its kind. Among other things, it features the largest, most complex pre-Neolithic building yet discovered, an unparalleled series of artefact caches and activity areas, and a rich corpus of late Pleistocene (Ice Age) art pieces. The final report on the site, combining the views and analyses of twelve national and international colleagues,

Excavations at Wadi Hammeh 27 in 1987. A large curved stone wall emerges in the foreground trench and the Jordan Valley lies in the background.

Bulletin editor Ben Churcher excavating a cache of basalt tools in 1988.

is an integrated analysis and interpretation of subsistence strategies, settlement patterns and ritual life in one of the world's earliest village communities.

Wadi Hammeh 27 was discovered in late 1980 by Phillip Macumber, who had been commissioned by the late director of the Pella Project, Tony McNicoll, to conduct a geological survey of Pella and its environs. It fell to the author to make an initial test of the site in early 1983. Remarkably, a small pit sunk into the deposits revealed a series of large sculpted slabs (see page 9), wedged diagonally across the 2m by 1m trench. Such things had never emerged from a Natufian site before (and the subsequent excavations at Wadi Hammeh 27 never produced any more). The find prompted McNicoll to open up the site to large-scale investigation under the author's direction. Other artefactual wonders then proceed to tumble forth on a regular basis, including an entire kit-bag of ancient tools (*Ancient toolkit gives glimpse of prehistoric life*, NEAF website: '*News and Links*'), and painstakingly arranged caches of basalt tools, found just where their owners had left them, many millennia ago (photo above).

Wadi Hammeh 27 forms an important benchmark for the Early Natufian period, not only because of the abundant material culture it has yielded, but also because this is sandwiched within a narrow time-slice. Alone among the Natufian open-air 'base-camp' sites, the settlement comprises a relatively short occupation (ca. 12,000–12,350 BP/ 12,000–12,500 cal BCE). Unusually also, the deposits are uncomplicated by admixtures of earlier Epipalaeolithic or later Neolithic phases. Of course, the consideration of 500 years or so as short is a perspective which might only occur to an archaeologist of the Pleistocene! We should instead be surprised at the persistence of Natufian hunter-gatherers in their small settlements. Even so, Wadi Hammeh 27 is a brief episode compared to El Wad, Hayonim and Mallaha, where Natufian communities lived for up to two millennia while retaining a cohesive and consistent material culture.

This phenomenon of occupational persistence leads us to a long-standing issue of Natufian studies: the degree of sedentism represented by the large, open-air base-camps. Archaeological data have been scrutinised for generations in an attempt to provide a definitive answer, but the behavioural correlates of sedentary, semi-sedentary and transhumant residential strategies converge too closely for a clear solution to have emerged. The most likely scenario is that Natufian communities regularly vacated their larger settlements in order to fallow local food resources. Now, scientific techniques have become available which promise new insights into the issue and these will be followed up in the new project, which will further explore the basal layers of Wadi Hammeh 27.

Sedentary humans, like endemic animals, acquire the strontium signature of local rock types by ingesting local plants and animals. Strontium and oxygen isotopes measured in human skeletal material are used to determine the residential behaviour of past populations. The specific strontium isotope ratio in a rock formation is carried through to the soil developed on it, then inherited by the plants growing on the soil, and finally, is absorbed into the bones and teeth of animals higher in the food chain. The isotopic composition of human teeth provides a signature of early life, reflecting the geological regime where individuals have spent their childhood. Through prior analyses, project member Dr Louise Shewan (Monash University/ University of Warwick) has demonstrated the distinctive isotopic signature of Wadi al-Hammeh's sediments relative to surrounding geological provinces, and also that some Wadi Hammeh 27 occupants had clearly lived in the valley for extended periods while others had grown up elsewhere.

This result is valuable when combined with the recent demonstration that various growth features in primate (including human) dental enamel accrete over very short intervals (i.e. over sub-daily, daily, and weekly periods). Recent developments in imaging methodology, most notably phase contrast X-ray synchrotron microtomography, permit the identification of these fine-scale incremental growth lines. Small bundles of these incrementa, totalling no more than 1 to 2 weeks in the life of an individual, can also now be micro-sampled for their oxygen isotopic compositions by SHRIMP (Sensitive High Resolution Ion MicroProbe) and for their strontium isotopic compositions by Multicollector Laser Ablation Inductively Coupled Mass Spectrometry. Applied in concert, these analytical techniques have the potential to reconstruct the life histories of past populations. For example, if an individual alternated its residence between

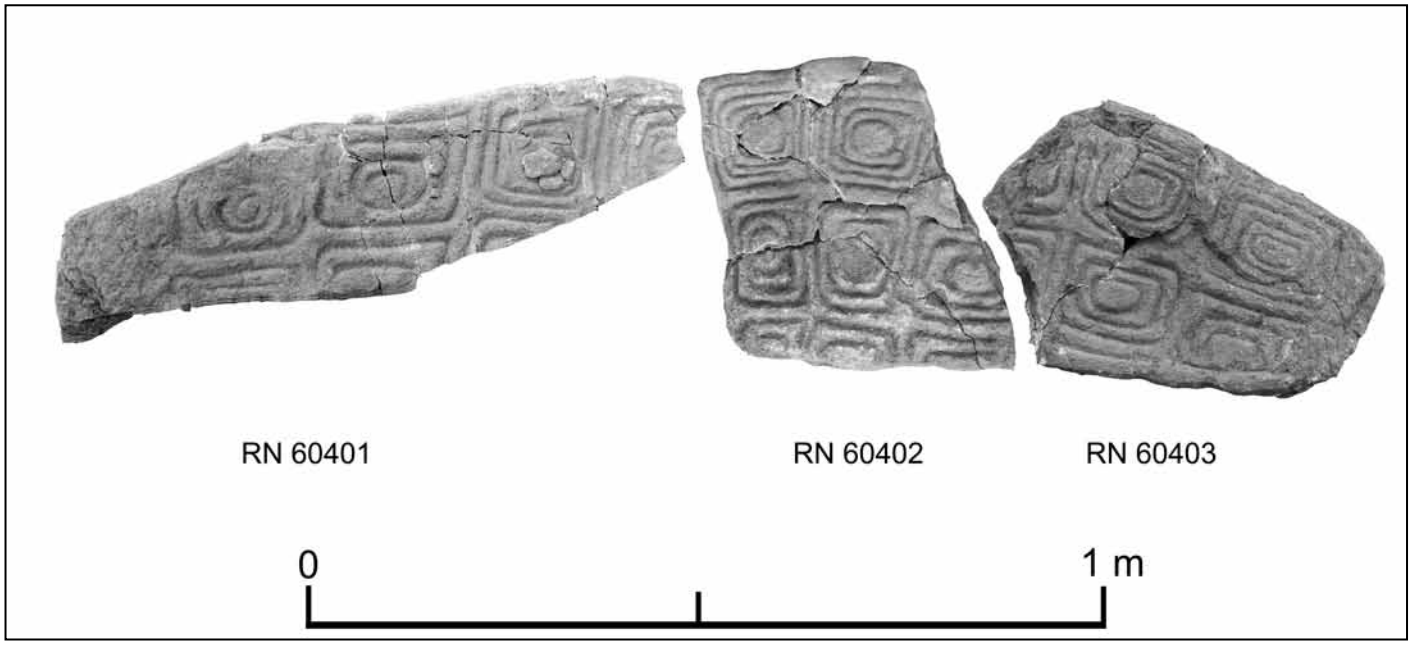
Wadi Hammeh 27 and another geological locale, the sequence of abandonments and reoccupation of the valley might be traced dentally, at a resolution of weeks and months, sufficient to monitor whether seasonal movements occurred within a single year, or whether individuals remained in Wadi al-Hammeh the whole year around.

A related study will investigate the social structure of the Wadi Hammeh 27 community by recovering ancient DNA (aDNA) from human skeletons buried at the base of the settlement. Analyses of Natufian human skeletal remains, conducted at a regional level by project member Dr Fanny Bocquentin (Université Paris Ouest Nanterre La Défense) and others, indicate variant patterns for male and female stature across the Natufian 'core-area' (roughly from the Jordan Valley and Galilee to Mount Carmel on the Mediterranean coast). Female stature is relatively homogenous whereas males show significant variation. This result indicates that males became genetically isolated in specific territories to a greater extent than females. The pattern may be linked to a distinctive aspect of Natufian mortuary practice: adult males, but never adult females, were sometimes buried in close association with neonates and infants. For example, babies were placed on the chests of adult men in multiple interments. The symbolic bonding of adult males and infants in death may reflect a system of inheritance through the male line. Bocquentin has proposed that this mode of burial suggests the practice of patrilocality, a system where women move from their childhood homes in order to settle as adults in the residences of their male partners.

Certain short sequences of DNA on autosomal chromosomes are useful to assess both maternal and paternal contributions to the genetic make-up of offspring. Paternal contributions can be tested by genotyping the non-recombining part of the Y chromosome and specific maternal genetic contributions can be assessed by determining patterns of similarity between individuals in the hypervariable region of mitochondrial DNA. The latest Next Generation Sequencing (NGS) technologies are now able to recover entire genomes of individuals from very short segments of aDNA. In recent years NGS has revolutionised the field of palaeogenomics, allowing the sequencing of complete genomes. With enough genomic sequence data, project member Dr Cristina Valdiosera (La Trobe University) will endeavour to determine population structure and genome variation in the Wadi Hammeh 27 community as well as kinship relationships among its groups of burials. In the case of a patrilocal society it would be possible, for example, to test whether a group of males buried in close proximity showed strong familial connections.

While remaining as hunter-gatherers like their forebears, Natufian communities embarked on a new way of living. No longer were they content to revisit the same general home range over the seasons. Instead, they began to return to a particular point on the landscape, and at this place they founded houses of stone. At Wadi Hammeh 27 they rebuilt one three times on the same spot, generation after generation. The eighteenth century philosopher, Jean-Jacques Rousseau (*Discourse on Inequality,* 1754) might have had the Natufian achievement in mind when he wrote: "The first man to fence in a piece of land saying 'this is mine' and who found people simple enough to believe him was the real founder of civil society." □

**Visitors to Jordan can view a reconstruction of a Wadi Hammeh 27 house-interior in the recently opened Jordan Museum in Amman. Artefacts from the site are also displayed in the Museum of Jordanian Heritage at Yarmouk University and in the Dar as-Saraya Museum, both located in Irbid.*



Three incised slabs from Wadi Hammeh 27 in their relative positions as found.

Investigating Neolithic Iran

Contributions of the Mamasani Archaeological Project

by Lloyd Weeks, University of New England

All students of archaeology are aware of the Neolithic as a period of critical transition, from societies who made their living by hunting and gathering to those who survived by farming, i.e. the keeping of domesticated animals and plants. This transition had a massive and undeniable influence on the course of human history: it is somehow (and the somehow is really what archaeology is all about) tied up with the origins and growth of permanent human settlements and with the social, demographic and economic changes that combined to allow the rise of complex urban societies in later prehistory, not to mention the eventual development of societies like our own. To get an idea of the significance, ubiquity and rapidity of this change, consider the world population of 12,000 years ago, 100 percent of whom lived by hunting and gathering. By the late 20th century, the proportion of the world's population still living by hunting and gathering stood at approximately 0.001%, representing an almost complete change in subsistence practices in just over 10,000 years and a truly staggering growth in population. Although many recent syntheses correctly highlight the fact that the transition to agriculture took millennia and was a slow, perhaps imperceptible process in human terms, on an archaeological timescale it is still easy to understand why Gordon Childe christened this change the 'Agricultural Revolution'.

Co-directed by former NEAF Director Dan Potts, alongside Iranian collaborators including Kourosh Roustaei, Alireza Askari, Alireza Sardari, Arash Lashkari and Ardashir Javanmerdzadeh, the Mamasani project involves staff and students from the universities of Sydney, Cambridge and Nottingham as well as the Iranian Center for Archaeological Research (ICAR) and several Iranian universities.

A view down the 15m deep sounding of Trench A at Tol-e Nurabad spanning the period from the pottery Neolithic, c. 6000 cal BCE, to the Middle Bronze Age, c. 1600 cal BCE..

The Mamasani project has undertaken multiple seasons of fieldwork since November 2002, aiming to understand

The northern edge of the high mound of Tol-e Nurabad, showing excavations in Trenches C and D.

Birds in flight over the flooded fields of Dasht-e Rostam-e Do, Mamasani, in the southern Zagros Mountains.

the cultural development of this one small, beautiful region in north-western Fars province, Iran, over the course of the Holocene. Our fieldwork is multi-stranded, incorporating a surface collection survey to outline the develop of the regional settlement system (led by Bernadette McCall, USyd, and Mohsen Zeidi, ICAR) as well as coring for palaeoclimate reconstruction (led by Matthew Jones, Nottingham) and excavations at the three major sites of Qaleh Kali, Tol-e Spid and Tol-e Nurabad. Qaleh Kali is an important Achaemenid (royal) way-station, and Tol-e Spid has produced a sequence of occupation more than 20m deep spanning the Chalcolithic to post-Achaemenid periods.

It is at Tol-e Nurabad, however, where our best excavated evidence for the Neolithic has been found. Located in the middle of the flat, fertile valley of Dasht-e Nurabad, Tol-e Nurabad rises 24m above the surrounding fields and covers an area of about 9 hectares. It is the largest surviving tell in the region with an occupational sequence extending over many millennia. Excavation of an initial deep sounding took place in 2003–2004, revealing around 5m of occupation dated to the ceramic Neolithic period that consisted largely of the superimposed remains of at least six phases of mud-brick and packed mud buildings. This was a very welcome surprise, given that there were very few surface indicators of Neolithic occupation at the site (three sherds to be precise!). A suite of radiocarbon dates on our deep soundings and some good ceramic parallels with previously excavated sites confirmed that the Nurabad Neolithic deposits ranged from c. 6000-5600 BCE, with the distinct possibility of a later phase of occupation of terminal Neolithic date, c. 5000-4800 BCE.

The material remains recovered from the Tol-e Nurabad Neolithic deposits were, somewhat paradoxically, both typical and unique. The most abundant remains were ceramics: all were of the basic type that characterises most ceramic Neolithic sites in Fars, being fired at relatively low temperatures, tempered with chaff or other vegetal remains, usually burnished, and commonly painted with geometric decorations. As early as the 1960s, Robert Dyson had dubbed this the "soft ware horizon", and it characterised Neolithic sites across most areas of Iran. So far, so typical. Where the Mamasani Neolithic ceramics were unique, however, was in the style and quality of their decoration. Vessels tended to have a thin layer of refined, un-tempered buff clay applied to their surface, which was heavily burnished to a very fine sheen, before the application of complex painted geometric designs in red and black. Whilst the general technology of ceramic production linked the Neolithic inhabitants of Tol-e Nurabad to their contemporaries throughout Fars and Iran, their style and decoration showcased a highly distinct local identity.

The excavations at Tol-e Nurabad (and Tol-e Spid) were critical in defining the ceramic indices for the different periods of occupation in Mamasani, and were used to identify and date a number of sites with Neolithic occupation across the three major valleys of the Mamasani region.

The initial excavations at Tol-e Nurabad were very small in area, and given the excellent prehistoric sequence that was recovered there, it was decided to expand excavations and open larger trenches on the north-western spur

A beautiful decorated vessel associated with an individual burial at Tol-e Nurabad, c. 5700–5600 cal BCE.

of the mound. These excavations began in 2008–9 and continued in 2009–10, and although still incomplete, they have provided further important insights into Neolithic settlement at the site. Most significantly, Trench D has produced deep midden deposits and several human burials from the later phases of the Neolithic period. These deposits produced abundant ceramics of types not previously found at the site. Based on typological considerations and radiocarbon dates, these deposits fill the gap in our occupational sequence between c. 5600 and 5000 BCE. Higher on the mound in Trench C, excavations under the direction of Cameron Petrie produced the very first evidence for household structures dating to the key transition from the terminal Neolithic to the Chalcolithic period. Although excavation is incomplete, it appears that we have around 8m of Neolithic occupation deposits at Tol-e Nurabad covering a period of around a millennium and an area of perhaps a hectare – certainly more than our surface collections indicated might be present!

Post-excavation studies of these remains are continuing, but Tol-e Nurabad has already added significantly to our understanding of the development of Neolithic communities in the southern Zagros. Work on the abundant animal bones, undertaken by Dr Marjan Mashkour at the Museum of Natural History in Paris, have confirmed the overwhelming predominance of domesticates from the earliest Neolithic levels of the site, especially sheep and goat which account for more than 90% of the animal remains analysed so far. Domesticated cattle are present but much rarer, and hunted species such as gazelle or wild boar are almost absent. In this regard, the results from Nurabad show a significant discrepancy from contemporary Neolithic sites in Fars, which exhibit a much higher reliance on the hunting of equids and gazelle. The plant macro-remains and charcoal are being studied at Nottingham University by Hengameh Ilkhani Mogadam as part of her PhD. These show the use of typical domesticated species of domesticated wheat and barley and the exploitation of various wood species including predominantly almond, pistachio and oak. Overall, the still scant bioarchaeological data hint at significant micro-regional differences in subsistence adaptations across Fars that are only now becoming observable with new excavations and analyses.

At present, the chronologies for the appearance of early farming communities both west of the Fertile Crescent, in Europe, and east of it in Iran, Central Asia and South Asia seem to support the primacy of farming in the Near East. The reliance of these early Neolithic communities of Europe and Central/South Asia on most components of the 'package' of domesticated plants and animals first integrated in the Near East also suggests a close developmental relationship.

But were people, plants and animals moving, or just ideas? This is a perennial question in archaeology. For many years, especially with the rise of New Archaeology and its rejection of cultural historical approaches,

An elaborately decorated Neolithic vessel from Tol-e Nurabad with black and (faded) red painting, from an early pottery Neolithic floor level in Trench D, c. 5900–5700 cal BCE.

diffusion and migration were dirty words. Archaeologists sought out evidence for independent inventions and developments, or for the adoption of agricultural practices by indigenous hunter gatherer groups in the process of becoming farmers. How the worm turns. Recent advances in bioarchaeological techniques, especially DNA and isotopic analyses of human skeletal remains, are painting a picture of Neolithic origins in Europe in which the migration of farming groups is the preponderant force for change. In the week of writing this article, two papers have appeared in the journal Science recording what appear to be long-term and fundamental cultural boundaries between indigenous hunter-gatherers and incoming farmers in Neolithic Europe, apparently living geographically contiguous but only lightly intersecting, near-parallel lives.

Is the picture in Iran similar? Are we to see the northwest/southeast sloping chronology of the earliest known Neolithic sites as a material footprint of the eastward migration of farming communities? Certainly, before recent work began to fill in the occupational history of southern Iran between 12,000 and 6000 BCE, such a model seemed a fait accompli. After all, there can be no indigenous developments towards agriculture without any indigenes! But by providing us with a local early Holocene population in southern Iran and by discovering even earlier Neolithic sites, recent archaeological research has delivered many more potential pathways for the development of agriculture east of the Fertile Crescent. DNA and isotopic analyses are not nearly as developed in this region as in Europe (indeed, preservation of biological remains in Iran's hot and arid environment might make ancient DNA studies very problematic), but already DNA studies of modern wild goat populations from Iran suggest that there was a distinct domestication event somewhere east of the Zagros, in which local wild goats were taken under human management.

There is a great story to tell about Neolithic origins in Iran and our collaborative work in Mamasani has the potential to contribute, in a small way, to the understanding of these dramatic changes, surely amongst the most significant in all of human history. □

A View from the southern Caucasus

by Antonio Sagona, University of Melbourne

Since 2008 the University of Melbourne has developed a collaborative partnership with the Georgian National Museum, investigating important problems in the archaeology of the southern Caucasus, and Georgia in particular. The umbrella project, known as the Georgian-Australian Investigations in Archaeology (GAIA), began in the region of Mtskheta, just north of the capital, Tbilisi, and for the past two years has moved its operations to the Samtskhe-Javakheti province in southwest Georgia. Here, in the once restricted military zone bordering northeastern Turkey, excavations at the ancient site of Chobareti, situated at 1610m above sea level, have so far revealed a settlement and burials of the Kura-Araxes culture (Late Chalcolithic/Early Bronze Age), and a late Antique/Medieval stronghold.

Why Georgia (or the Caucasus), I am often asked. There are several reasons for this region to interest those with a Near Eastern perspective. In the first instance, this is where we find a tangible expression of the mutability of the West Asian and European worlds. As an isthmus connecting the two vastly different regions, the Caucasus influenced to a lesser or greater degree cultural developments in the land of its neighbours, especially Anatolia, Iran, and south Russia. Yet, this north-central boundary of the ancient Near East is little understood. Even now, more than 20 years after perestroika, most western researchers still have only a vague understanding of the work of Soviet archaeologists in the Caucasus. The nature of this 'Great Unknown', as much of Soviet archaeology has been called, has started to change with collaborative projects, which are not only re-assessing earlier work, but providing much needed new data, studied and conceptualised within contemporary approaches.

The ancient site of Chobareti is conspicuously situated on one of the peaks of the Chobareti Mountains. Discovered during the excavations of a gas pipeline, the site comprises the southern slopes of two small hills and the saddle in between, measuring approximately 700–800m along its east-west axis. A series of distinctive wide terraces run across the site of Chobareti and the surrounding landscape. When exactly this physical modification of the topography was undertaken is difficult to determine at this stage.

Excavating a Barrow Burial at Chobareti.

Map showing the location of Chobareti.

The earliest settlers at Chobareti belong to the so-called Kura-Araxes culture, named after the interfluve where its earliest expressions are record around 3500 BCE. An extraordinary horizon, it is the most far-flung and enduring of all Near Eastern prehistoric material cultures, expanding swiftly across the highlands and well beyond. The complex is represented by the remains of hundreds of hamlets of agro-pastoral communities spread across a vast area that stretched from the Turkish Euphrates to the Caspian Sea. Southward it followed the arc of the Taurus and Zagros Mountains, extending down to the Amuq on one side and the Urmia basin through Godin Tepe to the Kangvar Plain on the other. A variant of this conservative complex is found in the southern Levant where it known as Khirbet Kerak.

Excavations in the Lower Operation at Chobareti have exposed terraced buildings cut into the soft, whitish, limestone bedrock; their lower walls were stone built, and most likely supported wooden superstructures. The floor levels of the buildings are very well preserved, with much in-situ material. One building (Structure 4) is unusually large, measuring around 18m in length, and curvilinear in plan with a compartmentalised interior. Inside it had the standard fitments of a Kura-Araxes building: fragments of horse-shoe-shaped andirons (portable hearths), a stylised horned animal moulded from clay, and fragments of pale-coloured (monochrome) pottery vessels. Judging by the number of ground stone saddle querns and concentrations of carbonised cereals in Structure 4, the inhabitants clearly processed food within its walls. Structure 3, by contradistinction, is a single-roomed house positioned on the edge of a terrace, overlooking the valley below. At the centre of the room, embedded into the floor, is a fixed, circular hearth, an important feature Kura-Araxes houses.

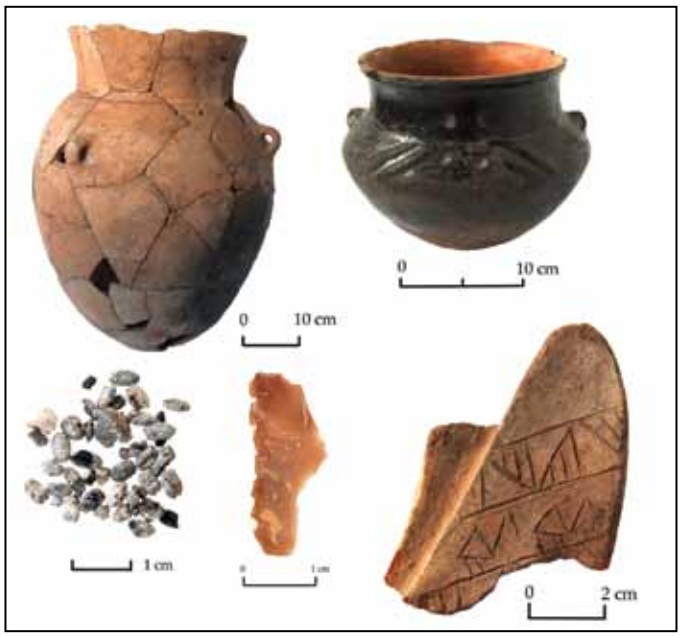
A view across the beautiful Kura Valley.

A considerable number of vessels were found on the hearth and around it, on a stone platform, and along the back wall. A suite of AMS dates taken from single grains place the settlement between 3300 and 3100 cal BCE.

The burials are slightly later. Rectangular in shape with walls built of small field stones, each tomb was sealed with two large slabs, originally supported by wooden beams. Inside each tomb the deceased was laid in a crouched position at times accompanied by a ceramic vessel fired to a black-and-red colour scheme, supporting the idea that this well-known mode of firing was not part of the original Kura-Araxes 'package'.

In the Upper Operation, removal of the turf and topsoil revealed extensive stone foundations of a large building, which in some places is set on bedrock. The most substantial wall line runs obliquely and measures approximately 12m in length and about a 1.2m wide, defined on both sides by a row of large stones each with a flat surface aligned edge to edge, facing out, into a room. A rubble packing of small stones filled the core of these foundations. A large door socket made of basalt is an indication of the building's scale. A rich and varied amount of ceramics was found scattered across the entire area. Surrounding this building is a stone perimeter wall 2m wide. Judging by the lack of any mud brick debris, the superstructure was most likely a wooden construction, perhaps in-filled with mud. Radiocarbon readings place this stronghold to the period around 1000 CE. In 2013, we also investigated the discontinuity that archaeological prospection noted about 60cm beneath the surface in 2012. Having reached that depth, we encountered a surface associated with the stone foundations of another wall. Time did not allow for these lower deposits to be investigated fully, but radiocarbon determinations place it in the 9th century BCE, the early Iron Age of the southern Caucasus.

Below the saddle, we began to investigate a conspicuous mound, which measures 12m by 10m around the base and is around 1.5m is height. It does not appear to be a natural configuration, so we strongly suspect that it is a barrow burial (a kurgan), of which there are several in the vicinity. Our aim this year was simply to determine whether it has a stone shell as many barrow burials do. Excavations began by removing the turf from a 2.5m strip running north-south across the top. Gradually, as the topsoil was removed, the shell appeared – a scatter of small and large field stones embedded in a white matrix. It is impossible to say, at this early stage, when the barrow was built, though it is likely to fall within the millennium between 2500 and 1500 BCE, when burial under a mound of earth and stone was particularly popular. □



Finds from Chobareti.

The Whispering Trees of Dhofar

by Wendy Reade, University of Sydney

Working in the United Arab Emirates in the 1990s was as close as I had ever come to Oman, its neighbour on the Arabian Peninsula at the southern end of the Gulf. Our archaeological team would take weekend excursions up grey stony wadis into the mountains of Fujeirah. Bumbling along in our enormous American tank of a Ford, we occasionally crossed into Omani territory. It was during these adventurous incursions that I was first entranced by rugged red stone mountains with stark white buildings spangled against them, and valleys that cradled dusty green date plantations. Wildy beautiful, Oman was serene with an ancient rhythm that belied its bustling merchant past on the great spice and incense route between the Gulf and the Indian Ocean. It was idyllically old Arabia, home of exotic frankincense, and somewhere I have yearned ever since to visit properly.

Twenty years later I am finally back in Oman on tour with a small group. We are in Salalah in southern Oman, some thousand kilometres from the capital, Muscat, and not far from Yemen. Today we are going up into the Dhofar mountains to find frankincense trees (*Boswellia*) in their natural habitat. Of the many species of frankincense tree, the finest resin comes from *Boswellia sacra*, which only grows in the Dhofar region.

Even though it is early, the day is already hot. Our Omani guide, Mahad, waits by the minibus as we emerge from our hotel. He is rotund and dishevelled, his natural state as it turns out, kefir wrapped into an untidy turban. He dabs his damp brow with the loose end of his headdress as he waves us onto our bus with enervated indifference.

The distant Dhofar mountains rise in shadowy silence beyond a barren desert. We drive through the featureless expanse, at one point passing a sparse little strip of frankincense trees planted by the road. The rows of spindly young trees in their bleak setting do not fill me with great anticipation. I have never seen a frankincense tree before and so far they have little but their famed resin to recommend them.

Frankincense has been used for thousands of years in rituals of purification and celebration, in perfumes and medicines. Even today, the distinct rich scent of the smoke wafts from censers in Omani houses to keep insects away. Frankincense was placed in Tutankhamun's tomb in Egypt and the Roman emperor Nero burnt a queen's ransom at the funeral of his wife, Poppaea. A shopkeeper in the Salalah *souq* explained to me the different qualities of frankincense. There is amber-coloured low-quality resin, the better quality *najdi*, and the even finer pale greenish *hawjari* and *hasiki*, which is supposed to have a stronger fragrance. Frankincense was harvested from the trees in the mountains and brought down the wadis to the port of Sumhuram to be traded, bringing wealth to the Dhofar region for thousands of years.

As our road begins to climb into the limestone mountains, the wadi beside us drops away to the plain receding below. Our road dips and winds through a dazzling white stone cutting, flashing brightly in the wrinkled brown landscape

Frankincense trees in a wadi in the Dhofar mountains.

Frankincense trader in the Salalah souq.

like a white-toothed smile in a sunburnt face. The road narrows and switches back and forth in hairpin bends, ascending the weather-beaten slopes, deeply lined from a million million summers, and wrapped in the frayed *dishdashah* of the timeless landscape, patched here and there with green, seamed by grey wadis, sequined by the splash of a white house or emerald domed mosque, sewn with the thorns of spiked desert plants. The soaring peaks watch carefully over their domain as, within their folds, they guard their secret wadis where the incense trees grow.

After we have climbed far up into the mountains, the bus pulls over on a culvert where a majestic grey stony wadi swathes its way down between the towering mountains. This picturesque tract is dotted with strange shrubby trees. Frankincense trees grow in only a few arid regions of southern Arabia and in Somalia, where moisture is provided by morning mists on steep hillsides or dried up riverbeds like this one. The Dhofar region is now the main source of frankincense, traded afar for over 5000 years. Of the different qualities of frankincense I am told the best grows here…

Our little group files across the large wadi stones towards the trees in curious and respectful silence, as visitors about to meet the elders of an ancient and revered race. Our heads bow to the trees as we carefully watch the ground where we step. They accept our homage with serene dignity, sap-jewelled statesmen whose fragrant beads are an intoxicating lure. And on their many heads, or so it seems, they wear a green haze of small leaves tufted into turbans.

The brown tissue-paper bark peels like sunburn from the olive-green fleshy trunks. It hangs in strips that wave and flick like bunting flags in the breeze, rattling in an ancient tongue. Where the flesh has been sliced away, it has bled pale jewel-green beads or 'tears' of the finest quality frankincense. When the sap first oozes from these wounds, it is milky white, hence the Arabic name for frankincense, *al-luban*, a term whose derivation means "milky whiteness" or "that which results from milking". The aromatic resin hardens to a translucent or transparent amber to pale green, hanging in luscious globules that skin hard on the outside with the freshest drips being still soft on the inside. I squeeze one and then press my finger into the fleshy skin of the tree expecting it to feel like a plump succulent, but there is no give in its hard orange-flecked skin. A string of resinous sap has dripped onto a stone below a sliced limb. I pick it up to smell the seductive scent before slipping it into my pocket.

Even though it is cooler here in the mountains, Mahad trudges damply humid to a large stone where he flops lazily at the foot of an old tree. He pulls his *dishdashah* up on his knees revealing his green, checked sarong-like wrap beneath. He mops his brow again with the trailing tail of his turbaned head-scarf, pulling it even more awry on his dark curly hair. He waves a heavy arm this way and that to point out a tree here and another there to his delighted group. Mahad is happy to sit in peace as we explore and absorb, taking photographs of the trees with their curious leaves and pale yellow, bottle-brush flowers.

As I pass near him, Mahad is taken by an unexpected burst of energy, jumping up with alacrity to call me, "Dr Wendy, you look here". He points to a tiny seedling tree bravely drawing life between the dry stones. "And here… and here… and see, another here," he indicates enthusiastically at this miracle, before collapsing back onto his favourite seat, directing us to take photos through the branches for artistic effect. He finds this game amusing as we oblige, posing for each other until it is time to pick our way back to the bus.

As the chatter of the group recedes, I linger in the breeze, listening in silence to the flickering whisper of the trees. The timeless essence of this place exudes from these most ancient beings, and I feel a reverence for the living history that is embodied in them. Long sought after for the luxury of their pungent sap, once worth its weight in gold, I feel a sense of nostalgia for a time I can never know. Today there is only a small market for frankincense as it has largely been replaced by synthetic chemical copies.

Back at the bus, Mahad plumps down into his seat, knocking his sunglasses comically askew as he sighs in contented comfort. As we drive away, the sun dips low and the rugged mountains once again enfold their scented treasure in the smoky mists of time. □

Pella in Jordan 2013

by Stephen Bourke, University of Sydney

Introduction

Archaeological field staff from Sydney University and other Australian universities, along with 36 NEAF-sponsored volunteers coming from all over Australia, and 40 local labourers from Tabaqat Fahl and surrounding villages, together completed another successful six-week season of excavations at Pella in Jordan between 6 January and 14 February 2013. This season saw excavation in four main areas, all previously explored. Excavations continued beside the large Bronze Age 'Fortress' temple on the south side of the main mound (Area XXXII), in the central tell region (Area XXIII), on the east summit of Tell Husn (Area XXXIV), and the lower west slopes of Jebel Sartaba (Area XIV). We shall discuss each excavation area in turn.

Area XXXII: The South Tell Excavations

Trench XXXIIBB: The Bronze Age Palatial Residence

In trench XXXIIBB, west of the Fortress temple, we have spent the last few years excavating a series of multi-room building complexes set close beside the Fortress temple west wall. In 2003–2007 we excavated perhaps half of a two-phase Iron Age II (9th–10th century BCE) 'Civic Building'. In 2009 we went below it, exploring a sequence of scrappy architecture and many large pits dating to the Iron Age I (11th century BCE), before uncovering three phases of a Late Bronze Age (LBA) 'Palatial Residence' (12th–14th centuries BCE) in 2011. In 2013, excavations continued deeper, uncovering two more phases of early LBA stratigraphy (16th–15th centuries BCE), before finally reaching the original Middle Bronze Age (MBA) Palace (17th century BCE), on top of which the LBA Residence was built.

The distinctive thick yellow, grey and orange 'checkerboard' plaster floors uncovered at the end of the 2011 season formed a three-fold sequence of re-plastered surfaces and rebuilt walls, dating within the 16th century BCE. These early LBA horizons were associated with three very large stone-lined pits, each around 3m deep. The central pit produced a number of atypical finds, including a number of ceramic bowls, an alabaster miniature vessel, polished bone and ivory objects, two-colour glass beads and a unique miniature crucible (with burnt bowl interior); the northern (slightly earlier?) pit contained several large but fragmentary storage vessels.

These pits are decidedly odd. They were certainly not wells, as they do not penetrate deep enough to impact the water table. The central pit is associated with stone-lined channels that the pit appears to have been cut down into, the southern pit has plaster surfaces acting as drains around it and traces of water-proofing plaster was recorded in the northern pit. This might seem to favour some form of water management purpose, however, deep stone-lined pits are known from roughly contemporary

View northeast across XXXIIBB in the foreground towards XXXIIFF that is located below the standing figures.

Syria, and these have been interpreted as ritual pits concerned with securing the favour of the Hurrian gods of the nether regions. Some of the finds from our central pit are consistent with libations and specialised offering paraphernalia. As well, the animal bones recovered from this pit contain a high percentage of uncommon species, featuring fish and fowl. So while we cannot say for certain what these pits were used for, there is a growing feeling that it wasn't simple water storage.

Towards the end of the season, excavations penetrated into the late MBA occupational horizons (17th century BCE), for the first time. These are more or less contemporary with the monumental stone phases of the nearby Fortress temple. The single construction phase uncovered to date is far more carefully constructed than its LBA successor, laid out as a series of neatly squared-off rooms, running off geometrically precise courtyard areas, with neatly defined doorways and thresholds, and thick yellow plaster floors, replastered multiple times.

First impressions of the earlier MBA complex suggest

it was originally designed as a palace, with all the public-function zones one might expect such a building to display if it was involved in the rulership and regulation of the city of Pella and surrounding regions. However, after the Egyptian conquest under Thutmosis III (15th century BCE), the structure may have been re-purposed as a prosperous town-house, for a still wealthy and influential family, but one that no longer ruled the city.

Taking the changing condition of the Palatial Residence as an indicator, it seems that during the early stages of Egyptian New Kingdom rule (15th–14th centuries BCE), a patchy prosperity was maintained, but in the later New Kingdom (13th century BCE), conditions in the Palatial Residence slowly declined, with increasingly poor repairs and restructuring a feature of later alterations.

Trench XXXIIFF: The North Quarter of the Iron Age Civic Building

Trench XXXIIFF was opened in 2011, immediately west of trench XXXIIEE (dug in 2009), with both these trenches located immediately north of XXXIIBB. The initial aim in this 'northern exposure' was to track down through the Late Antique layers to the thick destruction layers of the Iron II Civic Building. We have been investigating this building since its discovery in 1996, and with every season of excavation it keeps getting bigger, with no sign of a final dimension in any direction barring the east wall, located across a narrow alleyway from the Iron Age temple. Before this season parts of 29 rooms have been exposed and their varied contents excavated.

Much early effort (2001–2005) concentrated on the central/west of the structure, but in more recent times (2009–2011), we have been preparing the way for the exploration of the northern reaches. In 2009, trench XXXIIEE reached Iron Age levels in the northeast corner, but extensive exposure and full excavation was frustrated by large Byzantine period walls and a very patchy (but extensive) Late Roman mosaic pavement. In 2011, we moved immediately west of XXXIIEE, and excavated 5m by 5m trench XXXIIFF, uncovering a similar sequence of Late Antique through Byzantine architecture featuring very substantial walls, sitting directly on top of the patchy Roman mosaic. This is where we left matters at the end of that season.

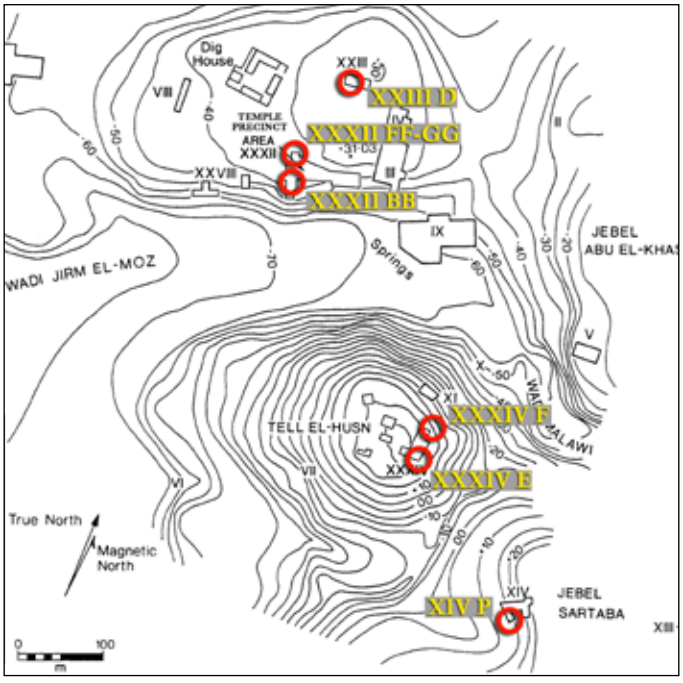
In 2013, excavations continued in XXXIIFF, first removing the standing architecture of the Byzantine period, before lifting the better-preserved squares of the Roman mosaic, preparatory to excavation of the Iron Age destruction debris sealed below the mosaic. Removing walls and mosaic took up much of the field season, and it was only towards the end of the season that several probes into the Iron Age uncovered two rooms in the northeast trench area, inside the line of the ever continuing east wall of the Civic Building. The outermost room, fronting onto the alley, was paved in a similar way to two rooms, excavated immediately to the south in 1999, confirming the duplication of room units (shops?) along the eastern frontage of the structure. We were just beginning to explore the Iron Age destruction layer when the season ended, but it had already yielded up a complete ceramic juglet, a faience bowl, and a few polished bone pendants. We anticipate great things for this area in 2015.

Trench XXXIIGG: The Umayyad Industrial (Glass-making) Complex

When it became clear in 2009 that the Iron Age Civic Building continued north of trench XXXIIEE, we knew we would have to go further north of the XXXIIEE/FF north baulk if we hoped to locate the northern edge of the Iron Age Civic Building. We began by excavating XXXIIFF in 2011, and followed this year with the investigation of new trench (XXXIIGG), 3m by 5m in extent, situated immediately north of XXXIIFF.

Work in XXXIIGG sampled an identical occupational sequence to that encountered in trench XXXIIFF in 2011, and consisted of patches of Abbasid period (8th–9th centuries CE) domestic occupation, extensive Umayyad period (7th–8th centuries CE) living surfaces, stone bin features and a dense complex of elaborately constructed mud-brick kilns, all probably associated with glass (and metal?) working. It seems that at some time after a very severe earthquake in around 550 CE, the original Late Roman/Byzantine (4th–6th century CE) town-house was sub-divided and rebuilt to form a series of shops and industrial work-spaces, which we suspect front onto a street to the north of the excavated area.

Below this Umayyad occupation, sealed by a thick earthquake collapse layer (from 749 CE), two phases of Byzantine (5th–6th centuries CE) and Late Roman (3rd–4th centuries CE) stone architecture (the later cut down through the earlier) were encountered. The earlier (almost levelled) Late Roman period town-house walls were associated with patches of black and white mosaic flooring, which had been cut through and very badly damaged by the Byzantine domestic re-building activity.



The two areas of excavation on tell Husn had commanding views across the Jordan Valley. The tell excavations and the dighouse can be seen below right.

Below the mosaic flooring of the Late Roman period, an extensive burnt destruction layer sealing the Iron Age Civic Building, was uncovered across the trench, dating from the Iron Age II (9th century BCE). Towards the end of the season, a small 2m by 3m sounding probed into this destruction, and had begun to encounter significant amounts of collapsed mud-brick debris and the first hint of wall lines when excavations ceased. These fugitive wall alignments seemed consistent with those previously excavated to the south, further emphasising the size of the complex, which extends more than 10m north of previously excavated areas. The Iron Age Civic Building must be more than 30m by 30m in overall dimensions, and is certainly the largest Iron Age structure ever excavated at Pella. We look forward to the full excavation of its 'northern exposure' during the next field season.

Area XXIII: The Central Tell Excavations

Trench XXIIID: The Hellenistic Town-House Excavations

The central tell area (Area XXIII) has been the focus of Hellenistic excavations since the mid-1980s. Although Late Antique materials are particularly dense in this central area, in many places cutting through earlier Classical period remains, discontinuous scraps of a large and elaborately furnished Hellenistic period (ca. 120–83 BCE) town-house had been isolated in trench XXIIIA thirty years ago. In 2011 the first coherent excavation area (10m by 5m trench XXIIID) uncovered several room assemblages from within the large house, and thick deposits of the extensive destruction debris marking its demise. In 2013, a 5m by 5m extension to the south of the original trench was instituted, to recover more of the Hellenistic housing complex in its better preserved southern reaches.

As in all previous investigations in the central tell region, extensive Late Antique horizons (Mameluke, Abbasid, Umayyad, Byzantine and Late Roman: 15th–3rd centuries CE) were encountered before the Hellenistic destruction was reached across the trench. In 2013, an extensive fiery destruction layer of Late Hellenistic date was uncovered as expected, alas this year without quite as much spectacular pottery as featured in 2011. This year one further long room was exposed, and within its destruction fill, several elegant juglets were recovered, along with a number of coins.

In a 3m by 4m deep sounding in the northern part of the original 2011 excavation area, parts of two earlier phases of Hellenistic material were detected, below the final Hellenistic destruction layer attributed to Alexander Jannaeus (ca. 83–80 BCE). The earliest levels encountered date back to around 200 BCE, and in all probability relate to the Seleucid dynasty re-foundation of the city. The middle phase Hellenistic layers probably fall around 150–120 BCE, with the elaborate late Hellenistic town-house construction following thereafter. Finally, as no trace of any Third Century BCE Ptolemaic period occupation was encountered in this central tell area, it seems that this earlier Ptolemaic occupation horizon must be sought elsewhere, perhaps on the western summit (trench XXXIVB) of Tell Husn, where it was first detected in 2007/2009.

Tell Husn East Summit Excavations

Trench XXXIVE: Early Gatehouse and EB I Fortifications

Excavations in 2009/2011 explored the two-phase gateway area on the southeast corner of the Husn summit, dating within the Early Bronze Age (EBA) I-II period (ca. 3300–2800 cal BCE). Work in 2013 expanded excavations 5m by 4m to the east of the original exposure, and almost

Half-sectioning a stone-lined Chalcolithic pit in Trench XIVP.

Excavating a Umayyad tabun *(oven) in Trench XXXIIGG.*

immediately uncovered a very large north/south stone wall, canted over to the east, but running under both gateways and (apparently) the central rubble platform itself. This newly discovered wall forms an outer skin to the very large wall exposed at the end of the 2011 field season, below the earliest gateway. Together they form a 'double layered' wall 2.5m wide.

The pavement in the earliest gateway rests upon the top course of this newly discovered 'double-layer' wall, while the 'double layer' wall in turn cuts down deeply into the preceding 'hollow-tower' round wall phase. So on first appearance it would seem that we have discovered a very large intermediate phase wall situated between the earliest gate and the round tower phases. However, there are problems. The 'double-layer' wall runs north along the edge of the summit, but stop perhaps 4m north along the exterior face of southern rubble platform, and then turns west in and under the rubble platform. Close scrutiny of this area of the relatively smooth external masonry face of the platform suggests the possibility of a joint in the platform fabric, at about the point where the 'double-layer' wall turns back under the platform, raising the possibility that the 'double-layer' wall construction was in part covered by a later expansion of an originally much smaller terrace platform, which was not (as previously thought), a single-phase 15m by 15m constructional event.

Further consideration of the area of the earliest gate construction reinforced this point. After work in 2011 it was clear that the northern pier of the early gate went in under the flanking buttress of the later gate. It now seems possible that it also went in under the fabric of the later expanded platform. Where does this leave us? I am now wondering if the massive 'double-layer' wall is in fact associated with the construction of the earliest gateway, given they both seem to go in under the later expanded platform fabric. The two constructions are actually in direct contact, with the lowest course of gate pavement resting on the uppermost course of the inner course of the 'double-layer' wall. If the two constructions are contemporary and related, then it may be that the 'double-layer' wall was intended to act as a major sub-surface foundational/support for the eastern end of the paved gateway, at the point where it turns sharply south around the edge of the Husn summit. If this sharp corner was a heavy traffic area, it would have been quite vulnerable to slippage, given the probably steep slope of Husn at this point.

Whatever the exact purpose of the 'double-layer' wall exposed in 2013, the stratigraphy and constructional sequence in the platform/gateway area has got a lot more complicated. The later (EB II; ca. 3000–2800 cal BCE) gateway certainly sealed all structures in the area, and the 'hollow-tower' phase (EB IB; ca. 3500–3400 cal BCE) clearly pre-dates all platforms and gates. One earlier (very fragmentary) EB I phase (ca. 3700–3500 cal BCE) of sub-rounded architecture features at the very base of the XXXIVE EBA sequence.

The EBA architectural sequence in the gateway area now has five structural phases. It consists of an upper and a lower gate, a double- layer wall phase (which may relate to the early gate), the round-tower phase, and the earliest sub-round architectural phase cut into the bedrock. All five phases range in date across the EB I–II periods (ca. 3700–2800 cal BCE), and represent a very important sequence of ever more elaborate early EBA fortifications, attesting to the vigour andambition of this first phase of urban life in the Jordan Valley.

Trench XXXIVF: The EB I-II Mud-Brick Circuit Wall

Excavations at the end of the 2011 season uncovered first evidence (in a 1m by 10m slot trench) for a monumental mud-brick circuit wall of over 3m in thickness running east/west from the northwest corner of the northern terrace platform. In 2013 we extended the trench by 5m by 7m to the north of the original main-trench exposure, to more fully explore the region of the mud-brick circuit wall.

The first task was to remove around 3m of MBA–LBA strata (17th–14th centuries BCE) that overlay the EBA circuit wall. In 1994–1995 we had detected scraps of what seemed to be a small military installation on the northeast corner of the Husn summit, destroyed in a severe earthquake around 1350 BCE. In 2013 we excavated four phases of increasingly scrappy MBA–LBA period architecture associated with the earlier 1994–1995 discoveries. As in 1994–1995, these MBA–LBA structures

had been built upon a deep foundational layer of stone rubble, in places up to 4m thick.

This MBA–LBA stone fill had been cut down into the EBA deposits, and overlay the circuit wall, cutting away around 40cm of the mud-brick wall's inner face along much of the 7m length exposed. This truncation had obscured the true thickness of the wall, which can now be seen to span around 3.6m, and not the 3.2m previously estimated. Further complicating matters, at the very end of the season, the remaining two-thirds of a large MB III (ca. 1600 BCE) chamber burial was found to have cut deeply into the lower outer (north) face of the wall. Together, these two 'down-cuttings' made the exposure of the lovely brickwork of the circuit wall problematic in the extreme.

Nonetheless, by the (frantic) end of the season, much of the 3.6m thick circuit wall had been revealed along 7m of its length abutting the west face of the northernmost rubble platform. As well, in places where the MBA down-cutting had removed all trace of the mud-brick superstructure, large fieldstone footings were beginning to appear along the inner (south) face of the wall.

The wall, preserved in places around 1.5m high, is monumental in scale and very probably encircles the uppermost hectare of the Husn east summit region. Pottery associated with the wall suggested its first constructional phase dated within the EB IB period (ca. 3200 BCE), and that it was in use throughout the EB IB-II occupation of the Husn summit. Traces of the squatter occupation (pits and postholes) that followed the terminal EB II earthquake destruction (ca. 2800 cal BCE), were noted across the top of the wall, adding valuable data on this most ephemeral horizon, which previously has only been found in isolated patches across the east summit.

We plan to expand excavations further to the west in the next field season, hoping to double the exposed length of wall, and to refine the stratigraphic sequence associated with its use.

The Jebel Sartaba Chalcolithic Village Excavations

Trench XIVP: The Chalcolithic Farmstead

In the 1980s excavations on the lower east slopes of Jebel Sartaba exposed a number of what were taken to be isolated farmsteads of the Late Chalcolithic period (ca. 4000 BCE). In these early excavations, the main interest was defining the heavily eroded architectural units, and recovering sufficient pottery for dating and functional analysis.

In 2013 a new trench (XIVP) were opened adjacent to early trench XIVM, to collect intensively faunal and botanical remains, employing flotation and careful sieving of occupational deposits to garner reliable environmental samples for the first time. We wanted to understand better the nature and purpose of these 'farmsteads', and whether or not we could make an argument for their use primarily as olive processing sites.

The first study of material gathered in the 1980s suggested the farms typical mixed farming concerns, but the absence of much animal bone and the very high incidence of olive remains made us suspicious that these structures were not simple farms. Excavations in our new 5m by 5m trench XIVP explored three phases of occupational debris above the sloping and crumbly bedrock. Analysis of the faunal/botanical remains suggest that over 95% of the botanical remains were of olive, and that all types of fauna were surprisingly rare, puzzling if the Sartaba structures were to be seen as typical rural farmsteads.

With our new data to hand, we feel more confident that these so-called 'farmsteads' were very likely to have been olive processing sites. As well as the botanical data, there is the circumstantial evidence of numerous rock-cut installations, pits, grooves and potential grinding areas, all situated across the bedrock outcrops surrounding the ephemeral built structures. Taken together, these data are not inconsistent with intensive processing of olive into oil.

Olive processing sites provide further evidence for intensified olive cultivation and oil production from around 4000 BCE. Olive oil is one of the key commodities traded throughout the region in the later EBA, fueling inter-regional interaction between Egypt and the Levantine townships, which in turn acted as a catalyst for ever more vigorous urban growth, eventually ushering in the first age of the city. We have a vivid illustration of the strength and productive capacity of this first urban age in the monumental fortification complex on the eastern summit of nearby Husn.

General Conclusions

Across the many time periods at Pella, work continues to produce monuments of the greatest importance to the history and archaeology of Jordan. The EBA remains on Tell Husn are of key significance in understanding the first wave of urban life in the region and marks Pella as one of its earliest centres. On the main mound of Khirbet Fahl, the monumental Fortress Temple and the large and carefully constructed MBA–LBA Palatial Residence(s) to its west are critical monuments illustrating the vigorous second urban phase of the MBA–LBA period.

In the Iron Age II, exploration of the Civic Building continues. The structure is now demonstrated to be more than 30m by 30m in extent, with more than 36 rooms exposed, in a complex that continues still further to the north and west. This monument of what should be seen as the third urban phase (ca. 9th Century BCE), well illustrates the strength of the later Iron Age revival in the region. Finally, excavations on the central tell (Area XXIII) provide further strong evidence for the sophistication and wealth of what is a fourth urban wave, of the Seleucid Hellenistic period (ca. 2nd–1st Centuries BCE).

Across the ages at Pella, all major pulses of urban life are vividly reflected in the long and variegated archaeology of the settlement. We look forward to continuing to reveal the many wonders of Pella in our forthcoming season in early 2015. □

Holy Cows and Lambs of God

Animal bones from the Pella temple

by Karyn Wesselingh, University of Sydney

My first encounter with the Temple at Pella was in 1999, when I spent most of my time in the field as a volunteer grappling with the not inconsiderable stones that were the foundations and the walls of the Holy of Holies of the LBA temple. In the following weeks I found myself in a progressively deeper hole dug against the west wall of the temple, sampling its stratigraphic history The experience changed my life. Twelve years on, armed with a Masters in Environmental Archaeology from Sheffield and now working on my PhD, I have finally managed to get inside the temple to study the animal bones.

In between children and veterinary work I managed to find three weeks in January 2013 to come to Pella as the team zooarchaeologist to work specifically on the animal bones from within the temple. I processed about 2500 fragments, which seems like a large number but is probably less than a third of the total. All the bones come from the Holy of Holies (inner cult room), or very close to it, and they span the later life of the temple from the Late Middle Bronze Age through to Iron Age II (1650 BCE to 900 BCE).

In addition to the remaining material from within the temple the animal bone from the temple environs and domestic areas is yet to be studied. Together this large sample will allow me to compare materials from the various interior spaces of the temple, the exterior courtyard areas associated with the temple, and from areas further away, to see how the pattern of offerings, activities and more general food consumption differed from place to place, and over time.

It would be safe to say that these 'temple bones' are of considerable archaeological significance, as they have been carefully excavated from a variety of contexts in close association with many cultic finds.

Whilst the animal bones from the temple only consist of the species that are found in other contexts, it is the absence of some species typically found in domestic areas and the age of the animals found, that is of interest. The most dominant species were ovicaprids, a term used to describe a sheep or a goat, because it is very difficult to differentiate between the two species using small bone fragments alone. Ovicaprids constitute 82% of the temple faunal remains, followed by 16% cattle. The other 2% is comprised of various wild species: equine species – probably donkey and the occasional individual fragment of fish. Although I am yet to examine the domestic contexts that are contemporary with the temple, analyses from other sites have looked at both domestic and temple contexts. In the domestic settings at the nearby site of Tell Hayyat, there is a mix of predominantly ovicaprid, with pigs and cows as the other most abundant species. However, from the temple areas at the same site no pig bones were found.

A shepherd leads his sheep across the tell at Pella.

It is the lack of pig bones that is perhaps most significant in regard to temple offering practice. All ancient Syro-Mesopotamian textual evidence suggests a strong taboo against pig offerings, as the animal was considered ritually unclean, perhaps because of its foraging patterns. In light of this, it is probably safe to say that, for southern Levantine Canaanite cultic practice, there was likely to have been a similar taboo against offering pork to the gods. A variety of (as yet unknown) cultural factors determined the species of animals offered in Canaanite temples, and that is one of the key questions I'm hoping to explore. For now, I can say that a similar attitude to pork meat is common to all the great historic religions in the region – Judaism and Islam to name but two.

Another significant find from my work this year has been the large number of bones from foetal or newborn sheep/goats (and a smaller number of foetal/newborn cattle fragments).

The majority of these bones come from the foundational layers of the Late Bronze Age temple. Their presence in such a significant cultic location is revealing- here they probably form part of the residue of the foundation offerings, which were intended to sanctify the temple and link it to earlier 'houses of worship' on the site. While the study of the bones is ongoing, the information we currently have begins to shed some light on Canaanite religious practice; the actual archaeological evidence is an important addition (and potential corrective) to our largely text-based knowledge of Canaanite cult and ritual.

There is still much work to be done on the animal bones, and I hope to return to Pella in 2015 to study more of the material pertaining to the temple and its environs. The analysis and interpretation of this faunal material will add significantly to our knowledge of Canaanite religious ritual. □

Elites along the Euphrates:
A monumental tomb at Jerablus Tahtani by Carchemish, Syria

by Edgar Peltenburg, University of Edinburgh

Before the 1st World War, T.E. Lawrence (later 'of Arabia') and Sir Leonard Woolley carried out sustained excavations at the great city of Carchemish situated midway along the great bend of the Euphrates River. It is well known in historical records for a major battle at the downfall of the Assyrian Empire and as the capital of the Syrian province of the Hittite Empire. Unfortunately, subsequent peace agreements rendered the ancient city inaccessible for further investigation, since the new border between Syria and Turkey virtually bisected the site. The division led to the neglect of the whole region as archaeologists shifted their attention to Mesopotamia.

Neglect turned to intense activity when governments decided to harness the waters of the Euphrates. From the 1970s, local and international archaeological teams were invited by the Syrian government to rescue information about the past before evidence disappeared below reservoirs held in check by a series of dams. In response to one such invitation we chose the site of Jerablus Tahtani, adjacent to Carchemish. It was in that manner that, after a gap of 70 years, a team from the University of Edinburgh returned to the area of Carchemish, at the north end of the Tishrin dam reservoir which now extends for some 60km immediately to its south .

"The little mound that was the out-post of Carchemish"

So did Lawrence describe the location of the site where we conducted excavations from 1992 to 2004. It is an oval, steep-sided mound, 150m by 180m, rising some 16m immediately beside the right, that is, western bank of the Euphrates River. In order to test the character and longevity of the pre-Classical remains of the mound, we opened four areas on its north (Area IV), West (Area III) and South (Areas I and II), in addition to soundings both on the tell and in the Jerablus plain to its west. We identified five major periods of occupation, from pre-Uruk times in the earlier 4th millennium BCE, when local peoples founded a settlement on a low Pleistocene terrace beside the Euphrates, to the 13th century CE when a grand building crowned the top of the mound.

Period I

Open pitted areas with occasional structures and a secondary burial belonging to the Chalcolithic period of the 4th millennium BCE were isolated near the base of Area III. Because excavations were 8m+ deep here, we could only sample a small extent of this period. Most of it lies deeply buried under later occupation at the centre of the mound. Recovered material includes "Uruk" pottery that is diagnostic of South Mesopotamia and its suggested colonies and enclaves in or at the edge of resource-rich zones in the highlands lying north of the Fertile Crescent. The site may have been pivotal within a network of communication routes since a mound on the opposite side of the river and a 20km long chain of six sites at regular intervals to the west also have this highly recognisable Uruk pottery, in contrast to neighbouring sites. Although no boats were found, bitumen, a water-proofing agent frequently used to caulk riverine vessels, was processed at the site.

The Euphrates River looking in the direction of Jerablus Tahtani to the north, before the creation of the Tishrin reservoir. Project archaeozoologist, Paul Croft, is in the forground.

Period IIA

Following the demise of the extensive Uruk system, traces of an open village occurred over the Period I material. There was no sudden change or destruction to mark the transition to a new world, only a gradual evolution of modest structures and pottery types. The latter includes the appearance of 'champagne glasses', so named by Woolley and Lawrence because of their resemblance to the tall-stemmed glasses. They became the hallmark of the earlier Bronze Age in this region as well as in Mesopotamia to the east and Anatolia to the north where

Excavations of Early Bronze Age levels at the top of Area IV in 1998. The supervisors, Adam Jackson from Edinburgh and Tom Rymer from La Trobe, are in upper and lower steps respectively.

they are often referred to as 'fruit stands'. The apparent post-Uruk contraction into small, self-sustaining villages may be misleading since pottery workshop material was found on the plain to the west of the mound, and a jar-sealing with far-flung connections on the mound itself. Such an international style sealing implies the existence of administrative functions beyond the attainments of village-life.

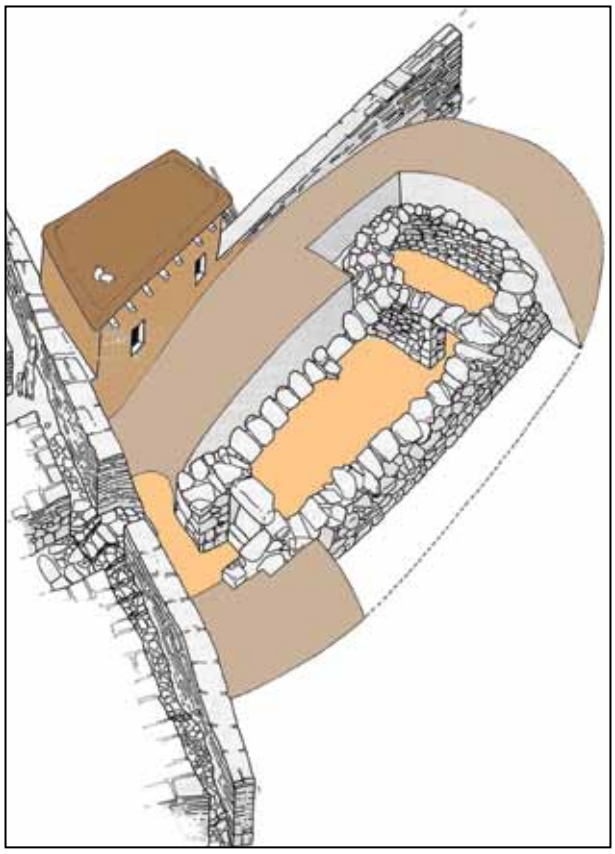
Period IIB

The low mound was completely re-shaped and given its final tall form in the 28th century BCE by the builders of a fort who erected the compact 50m by 75m structure over the burnt remains of Period IIA. The sub-circular fort wall was initially free-standing with drainage outlets incorporated into its base. In other words, it was part of a single comprehensive design in which both the drainage system of the buildings inside the fort and the defensive wall were integrated. This carefully planned major operation raises the possibility of external imposition, one supported by the evidence for destruction of the preceding village. In a second construction phase, the interior and presumably the wall itself were artificially raised by some 2m and a rampart c. 12m wide was thrown up against the exterior of the wall. Later additions to the fort included a walled South Terrace with a lengthy gateway system. Viewed from the plain to the south, the fort would have appeared as a series of ever-higher walls, less elaborate but otherwise much as depicted in later Neo-Assyrian representations of North Syrian towns. The fort lasted some 500 years until its abandonment c. 2250 BCE at a time of exceptionally high Euphratean floodwaters and inter-state warfare that saw the destruction of such notable centres as Mari and Ebla, the latter having claimed authority over Carchemish .

Because we have little idea of the status of Carchemish before Eblaite suzerainty, it is not clear if Jerablus Tahtani constituted an independent polity or was an outpost of Carchemish, as Lawrence assumed. This relationship bears on interpretations of what is arguably the most important discovery in our excavations, a monumental tomb that was located so that it loomed over all who went in and out of the fort.

Monumental Tomb 302

Virtually all Early Bronze Age graves in the Middle Euphrates Valley are below ground facilities. They mainly occur as stone cists or chambers accessed from shafts in cemeteries arrayed in the immediate vicinity of settlements or, in some cases, unattached to population centres. There are two exceptions to this normative subterranean behaviour. The first are small above ground cairns, that is, low stony mounds heaped over graves. Jerablus Tahtani Tomb 302 belongs to a second group which consists of large tombs and mortuary settings located on eminences or other strategic positions so that they form highly visible landmarks. This newly discovered group provides striking fresh evidence for the profound role of ancestors in the



Reconstruction of Tomb 302 showing its relationship with a late and much reduced phase of the associated passage leading to the fort gateway. Drawing by Gordon Thomas, Edinburgh.

daily lives of the living, as well as in ritual performances that furnished opportunities for sustaining tradition or for change .

The publicly visible tomb, at least 15m x 10m x 2m, consisted of a rectangular main chamber with an entrance defined by a massive stone lintel and threshold, and an annex. Its corbelled walls were constructed with six courses of transversely laid limestone blocks. In a further embellishment, two parallel walls framed an entrance approach to the main chamber. In the passage formed by these walls lay the severely disturbed remains of an adult. The whole was covered by an earthen mound, perhaps originally with a stepped or corrugated surface. The mound comprised horizontal layers of compact muddy brick material with discrete sherd lenses. In a possible evocation of the past, almost all the pottery deliberately selected for these lenses belonged to some 500 years before the mound's construction.

Political strategies are evident in the choice of location for the tomb. Conspicuous display was but one element of these strategies. Placed near the foot of the South Terrace wall on a spur beside the Euphrates, it was visible to all river traffic. Of greater significance is the fact that this house of the dead was part of the fabric of the fort in such a way that it stood like a guard between the inside and the outside. In later times, the physical remains of ancestors were replaced at the entrances to major structures by representations of warrior deities or supernatural beasts. As members of the community and visitors were channelled through the

One of the many 'champagne glass' high stemmed bowls from Tomb 302 (left) and a depiction of how a similar example was held and formally presented at the contemporary city of Mari (right).

narrow walled passage that led to the gatehouse, they had to pass by the entry to the tomb, the only other exit from the passage. In that way, the carefully controlled route into the fort was imbued with the aura of the ancestors, as were the residing elites who continued to wield power by virtue of their association with those buried in Tomb 302. When compared with traditional below ground graves, therefore, we can see that the strategic setting of the monument symbolized an entirely new relationship between the living, the dead, the ancestors and the world around. This discovery, so far unique, furnishes us with new insights into the socio-political role of ancestors in the Ancient Near East.

The tomb had a complicated history which we could unravel thanks to the stratified deposits inside the main chamber. Some 18 to 30 men, women and children were buried together with more than 500 objects in the first phase of its use. Chief amongst the pottery were about 100 'champagne glasses' of the type first uncovered at Carchemish . As shown on a contemporary incised shell from Mari, such vessels were used by elaborately robed courtesans in processions and in formal presentation scenes. A team of the project's bioarchaeologists has shown that the interred were of taller stature, with less dental caries and different diet than people buried elsewhere on the site, so they comprised an elite group, perhaps a multi-generational family. In the second phase, the top of the mound was cut away and the stone roof partly removed. The interior was not just ransacked but desecrated, as shown by the scattered nature of the human bones, many of which were also removed. The resulting hollow in the centre of the mound became a rubbish dump before the monument was once again used for mortuary purposes in Phase 3. Surprisingly, however, there were no burials in this phase, only discrete clusters of nearly 400 objects including many metal weapons like those found in the Royal Cemetery of Ur . The monument had become a focus of memory where people came to honour the dead in commemoration rituals.

At the moment we cannot connect the contrasting activities at the monument with other changes in the fort, but from its prominence we can suggest that such events were instrumental in the political fortunes of the elites at the site. During Phase 4 more rubbish and erosion deposits accumulated before storage pits were cut into the tomb in Abbasid times.

Who were buried in the tomb?

As we have seen, the age and sex range of the mortuary population is compatible with members of a family rather than with a special group such as priests or elders. We have also noted how exceptional they were amongst the other people buried at Jerablus in terms of diet, health and stature. Another feature that may help to answer the question of identity is the extraordinary size of the tomb in relation to the size of the small site. The chambers are amongst the largest Early Bronze Age burial chambers yet discovered in Syria, larger those from the great cities of Ebla and Mari, and about the same as a royal tomb below a palace at Tell Biʿa, ancient Tuttul on the Euphrates. The marked disparity between tomb and site sizes calls for comment. Documents recovered from the destruction of contemporary palace G at Ebla to the south vividly describe royal visits from Ebla to dynastic mausolea and funerary monuments located in the countryside. Some of the centuries old deceased in those rural places bore the names of villages. Perhaps they were originally village chiefs who were considered as founders of the ruling dynasty. The custom of burial at small, ancestral places far from new administrative centres during a period of increasing centralisation of power may well have been typical of state formation processes in Early Bronze Age western Syria. If so, then it may be that the illustrious occupants of Tomb 302 had their permanent residence elsewhere, but felt it appropriate to be buried at what may have been their ancestral home. Where their permanent residence was is a moot point, but if neigbouring Carchemish was already a major polity in the mid-3rd millennium, it is a likely candidate. One can only hope that the recently renewed excavations of that site will reveal its Early Bronze Age character. ❑

Marcia Taylor from Edinburgh and Abdullah from Jerablus excavating some of the Tomb 302 Phase 3 deposits in 1994.

The re-discovery of the 'lost' minaret of Qalca-i Zarmurgh

by David C. Thomas

It is notable how many of the most striking ancient structures in the world are also located in places of breath-taking beauty. Who can forget the seemingly interminable trek along the winding *siq* at Petra before rounding the last bend in the canyon and being faced with the towering Khaznah, sculpted out of the rose-red sandstone cliffs 'half as old as time'?

I experienced a similar 'wow' moment when I first saw the Minaret of Jam, nestled amidst the stark, fractured valleys of central Afghanistan. The minaret soars 65m high, an extravagantly decorated tower of baked bricks. It is testimony to Sultan Ghiyath al-Din's grandiose vision, his Nishapuri architect's brilliance, and, you suspect, a lot of blood and sweat on the part of the construction workers. As I researched the minaret a decade ago, I was intrigued by references to another tower in the region, roughly 75km south-west of Jam: the 'lost' minaret of Qalca-i Zarmurgh (Saghar). Could this elusive structure, which has never been seen by Westerners, rival the splendour of the Minaret of Jam? My efforts to answer this apparently simple question resemble a 'cold-case' detective mystery, scattered with snippets of tantalising information, hearsay, dead-ends and occasional fleeting glimpses of the structure.

Like the Minaret of Jam, the first mention of the 'lost' minaret of Qalca-i Zarmurgh appears in the records of the Afghan Boundary Commission. One of the Commission's agents, Dafadar Sahibdad Khan, an Indian surveyor from the 15th Bengal Cavalry, refers to it in a report in 1891. He does not, however, seem to have visited the site, merely noting: "There is a very old tower in a village half a mile from here, said by some to date from the time of Alexander".

Seventy years later, Mohammed Kohzad describes it as the site of "the important points of Ghor... It is here that the famous fortress of Zarmorgh is found and the first palaces of the Ghori kings. Here one sees, still standing a minaret of baked bricks, 30 metres high". More recent information about the site surfaced in August 2005, when Muḥammad Sarwar Azad, of the Ministry of Information, Culture and Tourism in Ghur province, assured me that the minaret was still standing. Spurred on by this promising news, I planned to visit the site to investigate further, but a combination of factors prevented me and my team from reaching Ghur in 2006 and 2007.

As I was unable to search for the minaret on the ground in person, I have since been encouraging NGOs based in central Afghanistan to take up the quest, and last year found a willing ally in David Smith of USAID. Although unable to visit the site himself, David kindly forwarded the first known photograph of the minaret, taken by Fazel Ahmad, a local historian and former Governor of Ghur province. The photograph shows a brick tower, somewhat

Photograph of the minaret of Qalca-i Zarmurgh by Ustad Said Omar.

less than the reported 30m high, in a poor state of preservation, popping above the surrounding trees. Little else could be gleaned from the photographic evidence, but further photographs emerged a couple of months ago, posted on Facebook by the local journalist Ustad Said Omar. These provide a clearer glimpse of the decoration on the tower, and the coordinates reveal that it is actually located in the village of Deh-e Qadzi, 5.5km north-west of where the site is listed in Warwick Ball's archaeological gazetteer of Afghanistan. Yet, despite now having more precise coordinates for the site, I have still not been able to identify it in high-resolution satellite images of the area, probably due to the relatively small size of the structure and the surrounding vegetation and buildings – 'remote archaeology' has its limitations!

Architectural details and parallels

Judging from the latest photographs, the Deh-e Qadzi minaret, as we shall now call it, is roughly 10m tall, although its upper parts are obviously incomplete. According to the elders of this area and local folklore, the minaret was part of a large mosque, surrounded by ten acres of land. An inscription on a piece of stone or wood, which has since disappeared, stated that the mosque was built by a woman named Bebe Sadiqa, who was originally from Sarpanak District of Ghur Province. It is said that Bebe Sadiqa was a kind and brave woman who, after the death of her husband, spent one eighth part of her inheritance to pay for the construction of the mosque and minaret.

The decoration on the minaret employs several styles, including horizontal bands, interlaced lozenges and zigzag ribbons, possibly made from baked bricks. Only by

attempting to describe and draw the decoration in detail does the complexity of what survives start to emerge, as is evident from Catriona Bonfiglioli's evocative illustrations. Although efforts to date a structure on stylistic grounds are inevitably speculative, its decoration exhibits similarities with that on eleventh- to twelfth-century Saljukid minarets and the earlier Hephthalite and Early Islamic fortresses of Ghur.

The minaret in its architectural context

While minarets form a relatively rare and visually spectacular component of Early Islamic architecture in the region, it seems likely that they were much more commonplace in the past. Over forty roughly contemporary Saljukid minarets survive in Iran and nearly half that number in Afghanistan and former Soviet central Asian republics. It is notable that al-Juzjani, author of the thirteenth-century Ghurid history, the *Tabakat-i Nasiri*, makes no reference to the minaret at Jam or the earlier Ghaznavid 'victory towers' at Ghazna, an omission that Judi Moline suggests is because "these minarets were nothing out of the ordinary" prior to the destructions of Mongol invasions.

The reference to a women as the benefactor of the Deh-e Qadzi mosque is also not unparalleled during the Ghurid period: the fortress overlooking the Minaret of Jam is known as 'citadel of the King's daughter' and the unnamed patron of the Shah-i Mashhad madrasa complex, 85km to the north-west of Jam, may have been the wife of the Ghurid sultan Ghiyath al-Din.

The minaret in its landscape

The minaret is set in a beautiful location, 2166m above sea level, nestling between high mountains which rise up to 3500m, including one called Zal Murgh (= Zarmorgh?). The district is well-watered and fertile, and is renowned for its fruit trees (green pear, apple, apricot, cherry, peach, plum, almond and walnut). It is situated in a relatively large surrounding valley covering 8.6km^2. By way of contrast, the Minaret of Jam has a comparable altitude (1900m), but only 0.2km^2 of flat land around it. The Saghar District, therefore, is a much more favourable area of habitation, although curiously it is Jam that became the Ghurid summer capital of Firuzkuh ca 1145 CE.

Given the dearth of cultivable flat land in central Afghanistan, it is unsurprising that the Saghar District has a rich historical past – it is associated with the nearby Ghurid astronomical observatories of Qala Mandish and Zal Murgh. Al-Juzjani refers to the area on several occasions, noting that the capital of the Shansabanis (the leading Ghurid family) is located at the foot of Zar-i-Margh / Mandesh mountain. He provides a detailed description of the castle / observatory, which reputedly had "twelve towers; and in every tower, in likeness to the zodiacal circles in the firmament, there were thirty openings – there were six towers towards the east and north, and six others towards the west and south – marked out; and these were so arranged that, every day, the sun would shine through one of those openings approximate to the position of its rise. By this means he used to know in what degree of what sign of the zodiac the sun was on that particular day; and this performance indicates the proficiency and knowledge which Amīr 'Abbās had attained in the science of astrology".

To this day, village elders use stand points located on the mountains to identify the exact times of sunset and sunrise, to forecast the weather and seek omens for the coming year. A ruined castle, with just its foundation stones remaining, is located on the side of Zar Murgh Mountain near to Mandish village; intriguingly, it is known locally as the Qasr Dukhtar Malik (the Castle of King's Daughter).

The significance of the discovery and the urgent need for conservation

The re-discovery of the 'lost' minaret at Deh-e Qadzi is significant as it solves one of the remaining mysteries of Afghan archaeology and highlights the veracity of the accounts of the nineteenth-century surveyors working for the Afghan Boundary Commission. The means of the re-discovery also demonstrate the value of partnerships between local Afghan people and Westerners, facilitated by modern modes of communication.

According to a local religious leader, the fabric of the Deh-e Qadzi minaret is slowly being eroded by rain and snow, a nearby stream and the carelessness of local people. Alarmingly, areas around the minaret have also been dug out by looters looking for antiquities. Urgent action is required to survey and document the minaret and its surrounds, assess its structural stability, engage with and educate local people, and develop a management plan to ensure the monument's preservation. There is clearly much archaeological work to do in the area, if we ever get the chance to go there... ☐

Drawing of the minaret by Catriona Bonfiglioli.

NEAF ARCHAEOLOGICAL TOURS

NEAF, in conjunction with the Academy Travel, run study tours to places that would be of interest to all people interested in archaeology and history. Our tours to Central Asia and Turkey/Iran will be departing later this year although they are filling fast. NEAF has several other tours in the pipeline for 2015. Please refer to the NEAF website or contact Academy Travel (1800 639 699) for further details.

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A Journey Through Central Asia
6-23 May 2014
with Ben Churcher

With their long histories, impressive sites and exotic ambiences, the central Asian caravan cities of Tashkent, Samarkand and Bukhara have long attracted intrepid travellers from the West. Travel to Uzbekistan and Turkmenistan has opened up and tourist infrastructure has been developed, allowing us to explore the archaeology, history and culture of more remote regions in these countries.

TURKEY & IRAN
In the Footsteps of Alexander the Great
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with John Tidmarsh

This 21-day tour traces the journey of Alexander the Great as he fought his way from Asia Minor and into Persia in the 4th century BC. In Turkey we visit cities conquered by Alexander, including Sardis, Bodrum, Priene, Aspendos and Termessos. In Iran we enter the formidable Persian Empire, stopping at Persepolis and Pasargad, famously destroyed by Alexander. Other sites in Iran include Naqsh-i Rustam, Hamadan, Bishapur and Isfahan.

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In addition, excursions to some other gems of Jordanian archaeology are part of a volunteer's time at Pella as weekly trips are taken to nearby sites in the company of archaeologists who have broad experience in both Jordanian culture and its long, fascinating history.

Further information on Pella is available at the NEAF website. Please join us by registering your interest using the form available at the NEAF website.

THE UNIVERSITY OF SYDNEY

The Near Eastern Archaeology Foundation was established at the University of Sydney in 1986 to promote research into the archaeology of the Middle East and North Africa. Activities include the annual production of the NEAF Bulletin, a lecture program and study tours. Support for research is through travel grants, fellowships, publication subsidies and field program finance.

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