

THE NEAR EASTERN ARCHAEOLOGY FOUNDATION BULLETIN

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Welcome to the 50th issue of the NEAF Bulletin. To mark the occasion we've gathered together a number of articles from many of the contributors who have allowed us to experience their archaeological investigations over the years. Our Director, Professor Dan Potts, searches for *ziggurats* in Iran, while our President, Dr. John Tidmarsh, brings us up to date with the recent Australian excavations at Jebel Khalid in Syria. Our past-President, Maree Browne, shares her enthusiasm for gardens experienced on a recent NEAF tour to Iran, while our Vice-President, Wendy Reade, fills us in on life in the dighouse at Jebel Khalid. Dr. Alison Betts reports on her recent adventures in western China, while NEAF stalwarts, Dr. Kate da Costa and Karen Hendrix, let us in on their latest work. A busy timetable prevented a regular contributor, NEAF's Treasurer Dr. Stephen Bourke, from contributing this time, but I can assure you that he will regale us with his recent work at Tell Nebi Mend in Syria in a subsequent issue. I hope that these articles help NEAF members catch up with the varied activities of NEAF personnel and I thank them all for their contributions for this landmark issue (as well as the preceding issues over the years since 1989).

Ben Churcher (Editor)

Building *ziggurats* in the air

In some discussions currently taking place in Iran, nuclear reactors and Khaibar-1 rockets take a back seat to *ziggurats*. *Ziggurats* are all the rage. Four years ago Dr. Sadegh Malek Shahmirzadeh, a distinguished Iranian archaeologist who has excavated many important sites, suggested that the great lump of mudbrick at the south mound of Tepe Sialk, unearthed by the legendary Roman Ghirshman in the 1930s and christened 'La grande construction', was not merely a big, fat, mudbrick platform, but the world's oldest *ziggurat*. Adducing finds made around it (often in questionable context), Dr. Malek argued that his *ziggurat* dated to the Late Uruk or Jamdat Nasr period (c. 3400-2900 B.C.). The *ziggurats* of Ur-Namma, founder of the Third Dynasty of Ur (c. 2100 B.C.) in southern Mesopotamia and the ruler generally credited with the 'invention' of the *ziggurat*, were therefore not the world's first *ziggurats*, nor were they any longer the oldest.

Fast forward two or three years and another Iranian archaeologist, Yusuf Majidzadeh, excavating at Konar Sandal in southeastern Iran, made a similar

The heavily-restored ziggurat at Choga Zanbil in southern Iran. Photographed during the 2006 NEAF tour to Iran.



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 educational programmes, study tours, residential weekends, and an annual dinner. Support for research is through travel grants, fellowships, publication subsidies, and field programme finance.

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A little touching up of the façade of part of the so-called ziggurat at Tepe Sialk, as seen by the author in 2002.

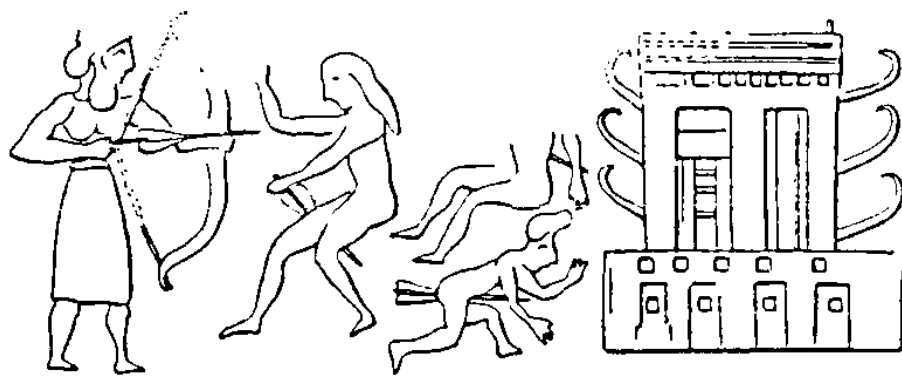
claim - a big lump of mudbrick, he argued, was in fact a 3rd millennium *ziggurat*, roughly contemporary with the Early Dynastic period in Mesopotamia (c.2900-2400 B.C.) and, you guessed it, older than Ur-Namma's by between three and eight centuries. Needless to say, there was more than a bit of national pride expressed in the realisation that Iran, rather than Iraq, was the birthplace of one of the most recognised building types in the ancient Near East.

Those of you who have already reached for your copy of the *Akkadisches Handwörterbuch* or the *Chicago Assyrian Dictionary* and got it open on your lap will, by now, have realised that our English term *ziggurat* is an Anglicised form of Akkadian *ziquurratu* meaning 'temple tower', '(mountain) peak', 'the pre-eminent'. In his *Religion in Ancient Mesopotamia* (2001: 116), the French Assyriologist Jean Bottéro described the *ziggurat* as 'a multifloored tower, which could include from three to seven stories, increasingly narrow the higher the story and connected by a staircase or ramp. It was usually about thirty meters high; but the most imposing, that of the temple of Marduk in Babylon (immortalized in the Bible in Genesis 11 as the Tower of Babel), was as high as ninety meters - we have its specifications and description in an intact tablet from the first millennium'. As the German archaeologist Hans J. Nissen noted, *ziggurats* were the most distinctive architectural feature of Ur-Namma's reign and although they certainly derive from a long tradition of placing

temples on elevated mudbrick platforms stretching right back to the early Ubaid period in southern Mesopotamia (c. 6000-5500 B.C.), the innovation of Ur-Namma seems to have been to introduce the central staircase, flanked by two side staircases, as a means of reaching the top of the *ziggurat*. In effect, the whole structure served as a huge platform to elevate the temple or chapel that sat on top. As Bottéro asked, 'Did they want to be closer to Heaven, or to bring Heaven closer to Earth? And what occurred in the chapel at its summit, in any event usable by astrologers and astronomers for their observations... and of which archeologists have still never found the slightest vestige, as they have been eroded for a very long time' (2001: 116).

I have never visited Konar Sandal, but in 2002 I did visit Tepe Sialk and Dr. Malek, just about the time he was formulating his *ziggurat* hypothesis. After drinking tea, Dr. Malek enthusiastically showed me the detailed contour plan he had prepared of Sialk, suggesting that the form of the *ziggurat* was now as plain as day. Perhaps in the eye of the beholder, I thought, but for the life of me I couldn't see anything regular, step-like or staircase-ish about any of the plan he thrust in front of me. Nor did the scales fall from my eyes when I was taken out to visit the site. What did catch my eye, however, was a couple of industrious masons, carefully putting *new* mudbricks along one face of the ancient mudbrick lump. Strange, I thought, restoring the site when the excavations have barely

begun? I quickly realised that this little bit of cosmetic touch-up work would make the outer face of the structure appear very regular and, as unbaked mudbricks were being used, the new additions would be indistinguishable from the old bits after a very short period of exposure to wind, sun and rain. In a couple of years, any fool would be able to recognise what I could not - that the great platform of Tepe Sialk was the world's first *ziggurat*.



A late 4th millennium B.C. seal impression (Sb 2125) from Susa that shows a bearded 'priest-king' attacking opponents in front of a multi-stage building. Scholars have long compared the curved shapes protruding from the sides of the building with the 'horns' on the ziggurat at Susa described by Assurbanipal.

I told Dr. Malek that I was sceptical - a polite way of saying all the tea in China would not convince me he was right - and have since said as much to any Iranian archaeologist who has asked for my opinion (which many have, as the topic is a pretty hot one, and Dr. Malek has to some extent staked his reputation on this hypothesis). Having said that, as Nissen noted, platforms of many meters in height are attested throughout southern Mesopotamia in prehistoric times, and indeed at Susa in southwestern Iran. This, surely, is what we have at Sialk as well, just as Ghirshman surmised. *Ziggurats*, on the other hand, really do seem to have been an innovation of Ur-Namma's, and no evidence that I have seen suggests otherwise.

In southwestern Iran, where the Elamites were the dominant group and political force from c. 2500 to 540 B.C., the word *kukunnum*, a loanword from Akkadian *gigunû*, was used as a designation for raised or 'high' temples, at least from the reign of Kuk-Nashur, one of the 'grand regents' of Elam (*sukkalmah*) who lived in about the 19th century B.C. At Susa, Kuk-Nashur built a *kukunnum* in baked brick for Inshushinak, the main god of the city. This may or may not have been the temple of Inshushinak discovered by French excavators in the early 20th century, which may or may not have been the same as a temple to Inshushinak built by Shulgi, the son of Ur-Namma, when Susa was under the rule of Ur around 200 years earlier. Susa may have had many temples to Inshushinak.

Nor was this the only *kukunnum* in the neighbourhood. In the 14th century B.C. they were all the rage. Igi-Halki restored an old *kukunnum* of baked brick for the goddess Manzhat at the great mound of Deh-e Now, possibly the ancient site of Hubshen. A few years later Humban-Numena boasted of rebuilding a *kukunnum* for the goddess Kiririsha at Susa that had fallen into disrepair. And finally, Untash-Napirisha really kept his architects and masons busy by constructing *kukunnums* at Susa for Inshushinak and at Choga Zanbil for Inshushinak and, as a divine couple, Napirisha and Inshushinak.

Since *kukunnum* is a loanword in Elamite from Akkadian *gigunû*, a term that appears in Akkadian sources as a poetic designation of a temple tower, one may well ask whether the *kukunnums* of Inshushinak were just *ziggurats* by another name? Possibly, but probably not, for Untash-Napirisha also says that he built a *zagrature* (Elamised *ziquurratu*) for Inshushinak at Susa and another at Choga Zanbil,

as well as one for Upurkupak at the unexcavated site of Chogha Pahn. Certainly the Elamites of this period would have had ample opportunity to see the real *ziggurats* of southern Mesopotamia, and Untash-Napirisha's *zagrature*, though different in form from Ur-Namma's, is the closest thing to a traditional, Ur III-style *ziggurat* one can find outside of Iraq.

While the imposing Choga Zanbil *ziggurat* is still there for all to see - NEAF tourists, among many others, have been there and clambered on the walls - rising up from the plain like an artificial mountain, one might ask what happened to the one at Susa? The answer, in part, can be found in the annals of Assurbanipal. In 647 B.C. the Assyrian army conducted a bloody campaign against Elam. Assurbanipal says, 'In a month of days I levelled the whole of Elam, I deprived its fields of the sound of human voices, the tread of cattle and sheep, the refrain of joyous harvest songs. I turned it into a pasture for wild asses, gazelles, and all manner of wild animals'. But more importantly for our purpose here, Assurbanipal boasts, 'I destroyed the *ziquurrat* of Susa, which was made of blue glazed bricks (and) cut off (its) horns made of shining cast copper'. Something like the horns described by Assurbanipal may even be shown on a much older cylinder seal impression from Susa. Assurbanipal's army, and other devastating events in Susa's history, may well account for the disappearance of the city's *ziggurat*.

The *ziggurats* of Susa and Choga Zanbil must have been extraordinary in their day. Inspired by an Ur III design, the Choga Zanbil *ziggurat* shows clearly that Elamite architects were happy to innovate and create something genuinely *Elamite* in style which still thrills visitors to the site. Sialk and Konar Sandal, on the other hand, represent something else. These may well have been forerunners of the *kukunnum*, or they may have been some other type of temple platform. Each of them is massive and represents a monumental feat of labour and ancient engineering, but I am convinced they were certainly not *ziggurats*.

Professor Dan Potts

For more information on the Elamites, see Potts, D.T., 1999. *The archaeology of Elam*. Cambridge University Press.



A view over the domestic quarter at Jebel Khalid with the Euphrates River in the background.

JEBEL KHALID: A SELEUCID GARRISON ON THE EUPHRATES

In the course of his 11 year conquest of the Persian empire, Alexander the Great was said to have founded some 70 cities; subsequently his general and founder of the vast Seleucid empire, Selucus Nicator, settled a further 60 or more. Whilst it is probable that these numbers are exaggerated, there is no doubt that during Alexander's campaigns and the period that followed them a large number of Macedonians and other Greeks came to settle (voluntarily or otherwise) in the lands which stretched from the shores of the Mediterranean to the Hindu Kush. It remains a striking paradox, therefore, that despite this large influx of Greeks into the Levant and beyond our knowledge of Hellenistic cities in the East (particularly of their earliest phases) is so meagre. Even Alexandria, the greatest of Alexander's foundations, has revealed very few traces of its Hellenistic remains which lie largely hidden beneath the modern city.

Far to the east, in modern Afghanistan, a chance find near the modern village of Ai Khanoum in 1964 led to the discovery of what must have been a military outpost established on the left bank of the Amu Darya river (the ancient Oxus) during Alexander's campaigns or by Seleucus soon after. Its ancient name is still uncertain but, uniquely, it was founded on a virgin site and not re-occupied after

its inhabitants had been driven out by nomads around the mid-2nd century B.C. Thus, for the first time, archaeologists had the opportunity to investigate a purely Hellenistic settlement lying close to the surface and not subjected to destructive over-building. Subsequent excavations by the French uncovered a large palace and a gymnasium, as well as two temples, several private houses and a heroön. From this early work it became apparent that the settlement represented an intriguing amalgam of Greek and Eastern influence; however, the Russian invasion of Afghanistan in 1979 brought work to a premature close and, tragically, the site has now been all but destroyed by some 30 years of constant looting.

On a rocky outcrop towering some 100m over the right bank of Euphrates River in northern Syria, Jebel Khalid bears a number of similarities to Ai Khanoum, not least being the fact that it too was founded on a virgin site and, with the exception of a very small Late Roman encampment, was not re-occupied following its (seemingly peaceful) abandonment around 70 B.C. Furthermore, as with Ai Khanoum, its ancient name is still uncertain. The lower courses of its beautifully constructed header-and-stretcher fortification wall (some 3.4 kms. on the landward side) are still in place whilst, when the light is right, the outlines

of the city lying just beneath the modern surface and arranged on a Hippodamian grid can easily be discerned - a tantalizing prospect for any archaeologist!

Under the direction of Emeritus Professor Graeme Clarke (ANU) and Dr. Heather Jackson (University of Melbourne), excavations have been in progress since 1987. Over this time an impressive Governor's Palace, perched high on the Acropolis and protected by its own fortification wall, a rather squat Doric temple (surrounded in its latest phase by a ring of sacrificial altars) and a complete housing *insula* have been uncovered whilst numerous graves (unfortunately mostly robbed) outside the walls to the west of the city have been investigated. At present, numismatic and ceramic evidence suggests that Jebel Khalid was founded not by Alexander but by Seleucus Nicator, no doubt to guard this strategic crossing point on the Euphrates.

I first visited Jebel Khalid in 1987 but, due to other commitments, was unable to become part of the team until some 10 years later. Along with publishing the imported wares from the site, I have been involved in the excavations themselves and this season (April-May 2006) began to investigate one of a series of rectangular

structures which would appear to be associated with the fortification wall in the southern sector of the Acropolis. It is still too early to determine whether these structures served as arsenals (similar to those on the Acropolis at Pergamon), storehouses or living quarters, but the evidence suggests a construction date in the 3rd century with further modifications during the second half of the 2nd century B.C.

Whilst the team at Jebel Khalid is much smaller than that at Pella, comprising some 15 excavators and specialists, the local work force is of similar size. Of the 60 or so workers (in contrast to Pella) a good proportion are women, often accompanied by their young babies - in fact, on some days the work site can resemble a giant crèche!

Although part of its 50 hectare area seems to have been unoccupied - a good proportion of the site seems to have served as a quarry for the stone utilized in its fortifications and buildings - there is no doubt that many important buildings still await investigation. Work over the ensuing seasons should thus give us a very clear indication as to how the earliest Hellenistic settlements in the East were planned and organised.

Dr. John Tidmarsh

PERSIAN GARDENS

Flying from Dubai to Tehran the land below looked mountainous and inhospitable. It turned out, however, that Iran is certainly mountainous but it is a most hospitable country. Travelling with the NEAF/ Continuing Education tour, Iran; the Magnificence of Persia, led so expertly by Ben Churcher, I was here to visit the ancient sites of Persepolis and Pasargadae and to further my research into the Persian garden and its antecedents - to see first hand these fabled gardens. Many of the eighteen people on the trip had travelled or dug together in the past. The members of the group brought various interest and experience to the tour but all shared a great interest in the archaeology and history of this ancient land.

Any anticipated angst from a security perspective disappeared before we left the airport as a result of the welcome from the immigration officers and the confidence instilled in us by our guide, Mahmoud. The perception that I had of a country that, while it had magnificent sites, was not intrinsically beautiful was blown away by the physical beauty of the country from the snow-capped mountains and shimmering rice paddies in the north to the extraordinary geological escarpments and turquoise rivers further south.

Travelling over 6000 km from Tehran to the Caspian Sea and south through the Zagros Mountains to the edge of the Gulf and then back through the Persian Gates to the high steppe and on to Shiraz and Isfahan we experienced just part of what this country had to offer. From the bazaars with their selection of magnificent carpets and edible wonders, to the stunning architecture and tile-work of the mosques of Isfahan to the jewel in the crown of ancient Persia, Persepolis, we were constantly surprised by what else Iran had to offer.

The surprises started with the first afternoon in Tehran and a visit to the Museum of Contemporary Art. Set in a wonderful modern building with the galleries spiralling down to a black pool of opalescent oil it displayed a



Ancient traditions linger on in the magnificent gardens of the Abbasi Hotel at Isfahan.



The pavilions, fountains and gardens of Hasht Behesht, Isfahan.

modern culture that we hear so little of in the West. For me walking in the adjacent gardens was my first experience of the gardens of Persia. In this beautiful park I saw the amazing system of harnessing snowmelt for irrigation used throughout Iran. This crystal clear water flows throughout the city in metre deep gutters and is harnessed to water the street trees, median strips and parks. Most town streets in Iran are lined with trees, mainly plane trees.

Though the Persian garden is synonymous with visions of green coolness, sparkling water, perfumed air and the song of the Nightingale, I did not expect this dream to actually exist. It does and throughout Iran, even in the smallest and often relatively poor villages and towns, these areas exist and are beautifully maintained. They form a community area for the town and one of the joys of the trip was to see families and groups of friends wandering these gardens be they the centuries old and magnificent Bagh e-Eram in Shiraz or simply a wide treed verge adjacent to the main-street. Most had fountains and water channels.

Again water was such a major element in so many of the other sites we visited be it the turquoise lake at the Sassanian mountain retreat at Takht-e Solaiman or the amazing Medieval water mills of Shuster. In the desert town of Yazd magnificent gardens were fed from aquifers tapped great distance away and brought to the town in underground tunnels or *qanats* built centuries ago. This water sprang crystal clear inside many of the houses and then flowed down through the gardens in long channels to the orchards beyond.

The Islamic architecture of Iran is among the most beautiful in the world. The soaring iwans opening onto the great prayer courts or the tomb towers with their intricate brick work vied with any Gothic cathedral for splendour and even here the great love of the flower is evident. Throughout Iran the mosques feature floral motifs in their decorations but in some this use of flowers is more pronounced than others. The Rose Mosque in Shiraz is one of the most beautiful I have ever visited, the winter prayer hall with its

shimmering golden light and turquoise tiles is an exquisite space. Everywhere within this mosque are depictions of roses and the prevailing colour of the tiles is pink. The love of the rose is evident everywhere from the solitary standard Just Joey in the Golestan (Rose) Gardens in Teheran to the massed plantings of red and white roses around the pool of the Chehel Sotun in Isfahan.

Stylised vines and flowers decorate the magnificently tiled façade of the Imam Mosque in Isfahan. Inside gardens, both imagined and real, are everywhere. The courts adjacent to the main court are shaded with white mulberries, heavily laden with fruit at the time of our visit. Tiled panels depict the Garden of Eden and flowers and tendrils climbed every tiled surface. This Persian passion for gardens and their flowers infiltrate every aspect of their lives. In the tomb gardens of the poet Hafez as the sky took on the deep blue of evening the gardens filled with local Iranians who come to read his poetry in this beautiful space dominated by his alabaster shrine set amongst cypress, roses and fountains.

For me this trip was a chance to further my research and see the gardens I study in their environment. This is an essential part of any research as it is not until you walk the ground, feel the weather and observe the landscape that the physical and cultural forces that created these spaces becomes clear. So often it is not possible to see first hand that which you study so I felt very privileged to be able at last to put the gardens of Persia into their true context and to see that they are not a relic of a bygone era but are a wonderful and essential feature of modern Iranian culture

This is a personal memoir and others will have taken away different impressions. I loved seeing the great sites that I have studied as an archaeologist such as Persepolis and Susa but for me it is this enduring passion for creating small paradises throughout their history, regardless of religion or politics and often in a harsh environment, that has most endeared the Iranians, past and present, to me.

Maree Browne

AN INSIDE JOB: Living and working in the house at Jebel Khalid

While the diggers toil up on the Jebel in excessive heat, those of us who work in the house down in the village count our blessings. We have a ceiling fan. We don't see much of the site, nor do we have the opportunity to gaze at the magnificent view down the Euphrates as we pause in our trenches to mop our sunburnt brows, but life on the inside has its own advantages.

We work in two houses rented from the local villagers. A charming mud plastered compound of rooms around a central garden courtyard houses the kitchen where our cook creates the most wonderful meals. Our architect pores over his plans of trenches and buildings in the calm of his room, when not out on site taking measurements. Our patient illustrator works in the shade of the walnut tree while next to her our landlady rolls up her sleeves to wash yet another load of dust stiffened dig clothes. Her unwavering disapproval of rinsing ensures that stiffness remains a quality and one is wise to wash smalls oneself.

The conservator, small finds cataloguer and I (bronzes) work in the other compound, shared with the family who lives there. Our days are punctuated by the children's antics, sweet cups of Arabic tea, and language lessons through our open window while we work. Sometimes they despair of our long hours, tempting us out of our makeshift lab with offers of freshly made rose petal jam, lavish meals, requests to take photographs of them and more tea. While they spend many hours in a day toiling in the fields, herding their few sheep and preparing food, there is always time for sharing and socialising.

We start work early, *de rigueur* on a dig, and at 9 am walk down the road from one house to the other to gather in the kitchen courtyard for refreshment. Every time we make that short journey all the small children run out to hold our hands and practice their English with us. The air is heavy with the scent of coriander as we enjoy the

sun and roses in bloom. The slowly browning wheat fields stretch away to the hills beyond, and are edged on one side with pomegranate trees, startling with their flaming orange blossoms.

It rarely rains while we are there (April–June) so the diesel chug of the bore water pumps in the fields is a constant companion. Occasionally the water is diverted from the house for irrigation leaving us nothing for washing or flushing, sometimes for a couple of days. With summer approaching and temperatures already in the forties, hotel showers in Aleppo once a week acquire a sanctity of unusual but unsurprising proportion.

At lunchtime the diggers return to tell of their day so far, and the photographer, having been on site all morning, takes up residence in the room outside our lab to photograph newly cleaned and conserved artefacts we have worked on all day. The Syrian museum representative shares the space to piece pottery together as the diggers set up their tables in a courtyard outside to sort through mounds of freshly washed pot sherds. Work continues on into the late afternoon, when the director brings around a treat of ice creams or boiled sweets.

Sometimes we take a break by going into the nearest town, Membij, to purchase supplies. Membij is a tractor town, rambling and full of everything from plastic flowers and buckets to fresh produce, electrical bits, shoe menders and other handy items, like scorpion powder – necessary at this time of year.

By 6.30 in the evening we are all ready for 'gin time', a very civilised prelude to another delicious dinner. The lemons are sliced, the nibblies laid out and piles of card and string wait to be cut and threaded as labels for the next day's finds.

And then to bed on the roof under the stars – until the harvesting begins and the tractors grunt and growl and the machine shop clanks until after midnight, and I am chased inside again. Travel time to work is minimal to say the least when you sleep on the lab floor!

Over the season a large number of objects are processed in the house from being cleaned, conserved, recorded, measured, photographed, illustrated, studied and finally packed away in large crates for further study or to be sent to their new home in the museum. And next year, *ensh'allah*, it will all happen again.

Wendy Reade

Looking towards Jebel Khalid across the Euphrates River.





Bronze Age 'deer-stones'.

ADVENTURES IN XINJIANG

It's hard these days for an archaeologist to find a new research area that is interesting, under-researched and also free from political uncertainty. Add to this an excellent climate, spectacular landscape, reliable infrastructure, low costs, good food and adequate plumbing and you can watch your colleagues' jaws drop when you tell them about it. China, of course, has not always been like this. It is only very recently that the central government has opened up to the West. This has happened to coincide with massive infrastructure investment in the previously neglected western regions, at least in part to quell nascent separatist tendencies among the Muslim Uighur population.

Central Asia stretches from the shores of the Caspian Sea to the eastern end of the Great Wall of China. United by trading caravans in antiquity, it has been split in two for the last few hundred years by the impenetrable linguistic, economic and political barriers dividing Russia from China. From an academic point of view this has been disastrous. The Russians can only rarely speak or read Chinese, while the Chinese have similar problems with Russian. Most western scholars can read neither language. Up until 1991 when Soviet Central Asia gained her independence, the whole region was locked away from the West altogether. Even today, for a western scholar trying to bridge this gap, the practicalities are complex. Apart from required knowledge of Russian and Chinese, the indigenous populations speak a wide variety of Turkic dialects, some of which have become official national languages.

Our team from the University of Sydney Central Asian

Programme has faced up to these problems and overcome them most satisfactorily. I have experience of Russian in Uzbekistan and a smattering of Kazakh/Turkman. My colleague, Peter Jia, is fluent in English and Chinese. Our Chinese collaborator Xinhuan Wu is a native speaker of Chinese and is also a specialist in Central Asian languages. The fact that he speaks little English is no obstacle as he and I can communicate quite well in German. Getting permission to work in China is still difficult but with a local collaborator the chances of acquiring a permit are reasonably good.

We have just completed a preliminary tour of Xinjiang to identify sites and work out the logistics of planning major fieldwork. Our area of interest is the Junngar Basin, the smaller and more northerly of the two desert basins that make up Xinjiang. The southerly Tarim Basin, home to the notorious Taklamakan Desert, was the path along which the caravans of the Silk Road travelled in antiquity. The Junngar Basin was also a through route, but in this case linking China with the Eurasian steppes. Our research concerns the Bronze Age, the period broadly from 3000-1000 B.C.

There are two key questions for us to address. A remarkable set of almost perfectly preserved bodies found in the Tarim Basin dating roughly from 2000-1000 B.C. are tall individuals with light coloured hair and Caucasian features. DNA studies have shown them to be European in origin. Later historical accounts talk of fair-skinned people in Xinjiang, and even today the indigenous Uighurs are more

light skinned and fair haired than the rest of the Central Asian Turco-Mongol population. It is clear that these people migrated from far to the west and this migration has been linked with the spread of Indo-European and Indo-Iranian languages. To the surprise of the textile specialists who studied their clothing, they even wore tartan fabrics almost identical in pattern and weave to those found in Scotland today. While I knew about this, I was still amazed to find a close variant of the Hunting Stewart wrapping a 4000 year old Chinese mummy. The second question is whether the early skills in metallurgy practised by the Eurasian nomads provided the impetus for the development of metallurgical sophistication in China. Development and management of the metals industry has been linked to the rise of statehood in mainland China and so this is clearly an important issue.

This time, our trip was to examine the feasibility of establishing a collaborative project with the Chinese in Xinjiang. It turned out to be an amazing holiday. We began in the regional capital of Urumchi and headed east along the Tianshan Mountains to the town of Jimsar. The Tianshan, like the Himalayas, are young fold mountains. They have glacier capped peaks, from which icy streams rush down through deep valleys lined with huge elm trees. These break out onto the plains below and run out into the desert sands. Along the foot of the mountains lies a belt of grassland. Most of the indigenous population is nomadic, many of them Kazakhs who have migrated into Xinjiang in the last century. They practice a form of transhumance, with winter quarters at the foot of the mountains, and summer camps in the alpine pastures just below the tree line on the high slopes. Their tents are the round mushroom-shaped felt homes that are typical of Eurasia and Mongolia. Jimsar was also a regional centre in the Tang Dynasty and there is a large Buddhist monastery there.

From here we went over a high pass into the Hami Basin on the south side of the mountains. Here there is an excellent modern museum where several of the Tarim basin mummies are on display. We visited a great number of Bronze Age burial grounds, many of which, sadly, are being robbed out rapidly. From Hami we headed north again, across the desert in the centre of the Junngar basin, heading for the Altai Mountains. Unlike the Tianshan, these are old mountains, worn smooth by ancient glaciation, with many upland plateaux. Here again the local population consists mainly of Kazakh nomads. They herd cattle, sheep, goats and horses, which are particularly suited to the upland pastures. Here we undertook a great adventure. The local officials told us of a massive Bronze Age monument high in the mountains. The temperature up there was below freezing, they said, and the road has been washed out by flooding. However, they were very keen that we should see it. Geared up for temperatures of up to 40 degrees centigrade in the desert, we were not ready for a sub-zero climate but we got together all the clothing we could find and bought several pairs of cheap cotton gloves. We left our Cherokee Jeep at the foot of the mountain. It was much too suburban for this expedition. Instead we hired

a very broken down Chinese military jeep with a drunken Kazakh driver who drove us 30 kilometres up a rapidly flowing, boulder-strewn stream bed. We only got stuck once and blew a spark plug in a convenient part of the track where we could make repairs. We eventually arrived in a grassy valley lined with pine trees where a number of Kazakh families had their tents. Brisk negotiations secured a bed for the night in one of the tents and hire of four horses in the morning. The tent was cosy with myself, the three men of our party, Grandpa and the host and hostess. Despite earthen floors and limited washing facilities, the bedding consisted of freshly aired doonas covered with sparkling clean white cotton covers. Although the outside temperature was freezing, I slept wonderfully well.

The next day we set off on a cluster of Kazakh ponies to climb to the top of the mountain. We passed the snowline and the wind rose; flecks of white flakes started to fall. Over the high pass we came into a wide valley filled with ancient glacial moraines and small lakes. Here you can find the beautifully carved 'deer stones' that are a remarkable feature of the Mongolian Bronze Age. At the end of the valley was a site I had no idea existed. A huge mound of stones, almost as big as an Egyptian pyramid, was set in a wheel-shaped pattern of low stone walls. The scale is massive, the effort to build it must have been monumental. It is almost certainly Bronze Age in date and is probably ceremonial, since similar but much smaller structures have been excavated elsewhere in Xinjiang. This was by far the most amazing sight I had seen in the region and one I had absolutely no idea existed. Its extremely remote location high on a mountain top on the Sino-Mongolian border, only accessible for a couple of months in summer, has meant that it is virtually unknown outside the local area. By the time we came back down the mountain we had been eight hours in the saddle and were so cold and sore that we could hardly move. The wind chill had pushed us close to hypothermia but it was worth every moment of the experience.

After this we returned across the desert to Urumchi where the main hazard was the large number of eagles on the desert road. Until the sun rises and creates thermals they find it hard to rise, but the best thermals occur over the black tarmac of the road. In Urumchi we visited the excellent new museum there, again with displays of extraordinary mummies. We toured the jade bazaar and bought souvenirs. Kunlun jade from Xinjiang was an important part of the Silk Road trade. Finally we returned to Beijing where, again in deference to the Silk Road trade, I checked out the traditional Chinese silk costumes. If you see me sporting silk brocade a lot in the future, you will know why.

The trip was wonderful, but it was also very productive. It is clear that there is important and interesting work to be done there, and that it may well be possible to start a new collaborative project in Xinjiang. We are now looking for funding and then we will see if we can make this a reality

Dr. Alison Betts

DRAWING THE LINE: The archaeology of Roman provincial borders

In February 2006 I took up an Australian Research Council Fellowship and Discovery Project grant for four years at the University of Sydney. For a quarter of that time I will be teaching in the Department of Archaeology, and will be starting a new course, *The Archaeology of the Roman East* from 2007. The bulk of my time will be spent on my research project, *Drawing the line: the archaeology of Roman provincial borders in Late Antique Palaestina and Arabia (AD 250–650)*. This developed out of my doctoral thesis research, when I was attempting to identify what might be limiting the distribution of ceramic lamps during the Late Roman to early Islamic periods in the southern Levant. Existing maps of the Roman provincial borders seemed best to explain those limits. You will not be surprised that what was actually limiting the spread of ceramic lamps was not the border itself but the customs duty imposed on goods crossing into different provinces, which made an economic barrier. Tax. Wouldn't you know it?

But when it came to actually properly mapping the borders involved, I found a rather startling fact: we don't know exactly where the internal provincial borders run.

The glue holding together the Roman Empire for over 800 years was its system of administration. The provinces, the extent of which reflected varying economic, social and political factors, were the basis of this system. Although these factors changed during the significant transition period of Late Antiquity, not one ancient source discusses the basis on which provinces were set up or changed. A critical first step is to define the actual extent of these administrative units.

There is one, superabundant, source of data which has not yet been utilised to fill the gap in our knowledge of both administration and tax and to link them together – archaeological evidence.

Distribution patterns of locally produced ceramics are significant indicators of local economic activity. Work on ceramics in the Galilee and Golan, the changing imports at Pella in Jordan and the distribution of lamps in Palaestina and Arabia have now demonstrated that distribution patterns of many locally made ceramic classes are irregularly shaped. This irregularity is best explained, not by distance from manufacturing centres, nor by major



(c) Kate da Costa/BAP 2006

An ancient reservoir next to modern housing, Kh. Nuwedrat, Jordan.

topographical features, but by the estimated line of the provincial borders. It seems clear that the customs duty on major borders remained in place until the late 6th century, and by making it uneconomical to import local ceramics from neighbouring provinces, distorted trade patterns. This distortion can be harnessed to map the location of the unknown sections of the provincial borders.

This project will extend the existing work of the University of Sydney excavations at Pella to the far hinterland of the city's territory. Within a regional survey we will be targeting already identified sites which are at risk from modern development. We plan to focus on ceramics of the 3rd to 7th centuries from these sites in the area of the supposed border route between Palaestina and Arabia. The overall corpus from each site will be categorized by reference to the known ceramics from Pella ('Palestinian') and Gerasa ('Arabian'). The ancient Roman border must lie between the 'Palestinian' and 'Arabian' sites.

There are around a hundred sites of the relevant time periods already known, lying in the area between Pella and Gerasa. Very little ceramic material from any of these identified sites has been published.

Once we have obtained the ceramic data from our surveys, sophisticated mapping technology will allow for the simultaneous examination of patterns deriving from different data sources. This makes it the perfect tool to deal with the variety of evidence: formal definitions of ceramic shapes, settlement patterns and types, ancient road alignments, agricultural installations, territory markers, limited evidence from other artefact studies and historical studies particularly on military and ecclesiastical topics.

We plan to survey 8–10 sites in the 2006 season, and another 8–10 sites in 2008. Once the 2006 season sorts out the inevitable teething problems of a new project, we'll be looking to take volunteers for the 2008 team.

I'm very excited about the next four years and look forward to exploring in detail an extremely beautiful part Jordan.

Dr. Kate da Costa

A STORY WRITTEN IN BONES

In conjunction with many other exciting things in my life, I have been undertaking my PhD in the study of human skeletal remains from Jordan, within the Department of Anatomy and Histology.

The majority of my PhD research material comes from Pella and over the last decade of working at Pella I have with the help of many volunteer hands, investigated, sorted and restored nearly all of the human remains dug up at the site by the University of Sydney's project.

The material I am most interested in comes from the 1987 season at Pella, when two rock-cut tombs (Tombs 88 and 89) produced the first large samples of Late Bronze Age-Iron Age skeletal materials excavated at Pella.

Tomb 88 is a small and greatly disturbed LB II chamber tomb, which notably produced ivory stamp seals and several large bronze and iron anklets. The tomb appears to have been re-used in the Iron I, with some material intruding from nearby Tomb 89 to the north, which cut into and partly disturbed Tomb 88. Estimations from the commingled skeletal material indicate around 78 individuals were buried in the tomb.

Tomb 89 is a bipartite chamber tomb, which was discovered intact. It contained over 200 funerary objects, including a bronze belt and an iron dagger, a beautifully modelled ivory plaque, several scarabs, glass and semi precious beads, as well as a number of alabaster vessels. Excavations in Tomb 89 revealed a burial cave utilised over a number of generations. The majority of the skeletons (with few exceptions) were pushed to the back of the chamber and largely disarticulated. Although disarticulated and fragmentary in nature, the material was carefully excavated, allowing partial reconstruction of more than 88 individuals from the tomb. The remainder of the disarticulated elements was analysed as commingled material by skeletal element. Approximately 45 individuals could be identified

Aging data has indicated that in general there are more adults in the tombs than sub-adults. The appearance of sub-adults (including infants and children) favours interpretation of the tombs as family vaults, probably employed over several generations. A first indication of identifiable common genetic traits adds further support to this theory. Considering the importance of having an entire skeleton for sexing, the disarticulated and fragmentary nature of the majority of remains from the tombs has meant that attempts to assign sex have been limited,



Some of the many skeletons excavated in Pella's Tomb 89.

and of variable reliability, although there is no reason to believe that a noticeable sexual imbalance is present. Sex estimation may help shed some light on burial customs, particularly those connected with the distribution and association of grave goods (e.g. necklaces, anklets, ivory plaques, alabaster), thus providing some important clues to social differentiation and wealth distribution during the early Iron Age.

Tombs 88 and 89 belong to the controversial LB/EI Age in Western Asia. The position of Pella during this period is far from clear. LBA Pella is characterised architecturally and culturally as a prosperous and wealthy city-state, operating under the influence (if not control) of New Kingdom Egypt. The transition from the Late Bronze to the Iron Age at Pella is marked by an extensive destruction across the site both in domestic and public areas, tentatively dated to the middle of the Twelfth Century B.C. The succeeding settlement at Pella during the Iron I is considerably smaller and suggests a settlement operating with much reduced resources, although the recent excavation of a massive LBA/Iron Age temple on the tell may force a re-evaluation of this picture of precipitous decline in the early Iron Age.

The main aim of my thesis is to determine if there are any discernable differences in the 200 individuals in the two tombs, and provide a profile of the population with specific attention given to paleodemography, paleopathology and genetically driven human variation. A second aim of the thesis is to determine if human skeletal evidence can offer further information on the question of identity of those individuals buried in the tombs.

I feel very privileged to be an archaeologist working within the fields of anthropology and archaeology and have enjoyed every moment of my career to date (except those 5.30 am starts at Pella!).

Karen Hendrix



NEAF ARCHAEOLOGICAL TOURS

TOURS IN 2007

EGYPT: A Thousand Miles up the Nile

March 2007 with Dr. Michael Birrell

Beginning in Cairo with an overview of the development of the pyramid and a visit to the Cairo Museum, this tour also visits Luxor, Aswan and Abu Simbel. The tour includes a four-day cruise down the Nile as it comprehensively examines the history and archaeology of this unique country. A NEAF/CCE Study Tour.

NORTHERN GREECE: Paths less Travelled

April 2007 with Ben Churcher

Northern Greece presents a quieter, different face rarely seen by most visitors to Greece. With its strong Turkish and Byzantine influences, northern Greece is home to great museums, interesting towns and important sites. From sacred Dodona to the islands of Thasos and Samothrace, this tour will explore paths less travelled. A NEAF/CCE Study Tour.

IRAN: The Magnificence of Persia

April 2007 with Dr John Tidmarsh

Due to the level of interest shown in our two Iran tours this year, we are happy to present an additional tour in early 2007 led by Dr. John Tidmarsh, NEAF's President. Come with us on a comprehensive tour of this ancient land as we walk in the footsteps of Elamites, Achaemenians, Alexander the Great and Zoroaster. A NEAF/CCE Study Tour.

MOROCCO AND MALI: From Casablanca to Timbuktu

November 2007 with Ben Churcher

Our very popular tour that visits two of West Africa's cultural jewels will be repeated at the end of 2007. From the splendour of Islamic Morocco with its bustling *souqs* and majestic *kasbahs* to the villages, people and landscapes of Mali - not to mention legendary Timbuktu - this is a varied and exciting tour. A NEAF/CCE Study Tour.

All enquiries and bookings:

Danielle Turner, Centre for Continuing Education (02) 9036 4765

email: dtturner@cce.usyd.edu.au

Priority Booking forms are available from CCE to secure a place on these tours.

Pella in Jordan Volunteer Scheme 2007

In early 2007 excavations will continue at Pella as archaeologists uncover one of Jordan's richest ancient sites.

For over 10 years our Volunteer Scheme has allowed people from all walks of life to become a member of the team working in Jordan.

In 2007 we will continue excavations in the Middle Bronze Age Migdol Temple and in the adjacent Iron Age building complex.

We hope you will be able to join us.

For further information:

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