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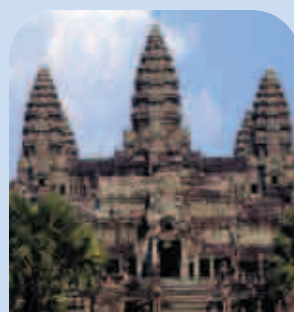
NUMBER 1

current *World* ARCHAEOLOGY

DIGS & DISCOVERIES FROM AROUND THE WORLD



- ▶ **Ephesus: a new building for an old city**
- ▶ **A tale of two cities: Egypt and the Maya**
- ▶ **The oldest pottery in the world**



Editor: Andrew Selkirk

Publisher: Robert Selkirk

Production Team: Wendy Selkirk, Anne Tickell,
Nadia Durrani & Libby Gladwell

9 Nassington Road, London NW3 2TX

Tel: 020 7435 7517 Fax: 020 7916 2405

email: editor@archaeology.co.uk

web: www.archaeology.co.uk

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What do ancient towns look like in different parts of the world? The best preserved of all towns in Ancient Egypt is Amarna, and Barry Kemp, Reader in Egyptology at Cambridge, recently produced an amazing model of the whole of the centre, and a large part of the major suburb of Amarna.

Ephesus 25

Ephesus was one of the great Graeco-Roman cities, capital of the Roman province of Asia Minor. It is one of the most highly visited archaeological sites in the world and here we report on how an entire insula of a Roman city has now been covered by a high-tech example of modern architecture.



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After Amarna, compare and contrast an Egyptian town with a Maya town, the town of La Milpa, in Belize in central America. Norman Hammond, Professor of Archaeology at Boston University (and also archaeological correspondent of The Times), has been rediscovering this lost city, still mostly hidden under the dense jungle.



Jomon pottery 44

What is the oldest pottery in the world? Surprisingly, it comes from Japan, and the latest discoveries suggest it may actually go back right until the last Ice Age.

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A major feature of Current World Archaeology will be that we reassess some of the great well-known sites of world archaeology in the light of the latest discoveries. How big, for instance, was ancient Troy? The Troy discovered by Schliemann was a very small city, hardly big enough for a palace and its immediate entourage. Recent work by Professor Manfred Korfmann has suggested that it was ten times as big, with a lower city thronged with people. His work has been controversial – what is the reality behind the controversy?



Angkor Wat

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Finally, we come to one of the most stunning archaeological sites in the world, Angkor Wat in Cambodia. The problem with Angkor Wat has always been that it displays strong Indian influence and many have argued that it must have been built by Indian invaders. Professor Charles Higham has been looking into the origins of Angkor: how far was it Indian? And how far was it Khmer?

Page 5. Letter from Baghdad

We begin appropriately, if somewhat sadly, in Baghdad where John Curtis, the Keeper of the Department of the Ancient Near East at the British Museum has been leading the BM's efforts to sort out some of the problems following the looting of the Baghdad Museum.

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Kay Prag, the author of the standard Blue Guide to Jerusalem reports on the situation.

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Professor Richard Hodges is conducting a major excavation in Albania and here he compares the situation in Albania with that in the Ukraine – with a look at the excavations in the Chersoneses.

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A round-up of some of the latest news. Oldest wheel found, How to dig abroad, The earliest evidence for Chocolate, Papua New Guinea, Out of Africa, Giant elephants in Abu Dhabi, the Mahabodhi temple complex, and Wings over Armenia.

Page 50. Books

How could we find a book for our opening discussion that would cover the archaeology of the whole world? Well, we have found one in the form of Steven Mithen's magnificent *After the Ice: an account of life between 20,000 – 5,000 BC*. Then there is an enthralling biography of Michael Ventris, *The Man who Deciphered Linear B*, and finally *The Complete Gods and Goddesses of Ancient Egypt*.

Page 35. Next Issue

Here we present some of the sites we have lined up for future issues of Current World Archaeology, and indeed of our sister magazine, *Current Archaeology*. There's lots more to come!

Amarna: BARRY KEMP, Reader in Egyptology, Cambridge University, is a world authority in Egyptology. He is author of *Ancient Egypt, anatomy of a civilisation* (Routledge), the best scholarly account of Ancient Egypt. His extensive website on Amarna is at www.amarna.org.uk. Email: webmaster@oriental.cam.ac.uk

La Milpa: NORMAN HAMMOND is Professor of Archaeology, and Gair Tourtellot is a Research Fellow in the Department of Archaeology, Boston University, USA, email: ndch@bu.edu. Professor Hammond is also archaeology correspondent of The Times newspaper. The La Milpa web-site is at www.bu.edu/lamilpa.

Ephesus: PROFESSOR FRIEDRICH KRINZINGER is Director of the Austrian Archaeological Institute in Vienna. Archaeologists from the Institute have been excavating at Ephesus since 1895. Email: fk@oeai.univie.ac.at

Troy: PROFESSOR MANFRED KORFMANN, University of Tübingen, Germany, has been excavating at Troy since 1988. His high-profile work there has convinced him that Troy is very much bigger than previously thought. Email: troia.projekt@uni-tuebingen.de

Angkor Wat: PROFESSOR CHARLES HIGHAM of the University of Otago in New Zealand, is co-director of an archaeological project at Angkor.

Jomon: SIMON KANER, is the Assistant Director at the Sainsbury Institute for the Study of Japanese Arts and Cultures, University of East Anglia, Norwich. Email: s.kaner@uea.ac.uk

Letters

Baghdad: JOHN CURTIS, Keeper of the Department of Ancient Near East at the British Museum, has been at the centre of the Iraq crisis.

Jerusalem: KAY PRAG, directs the Ancient Jerusalem Project at the Manchester Museum.

RICHARD HODGES, is Director of the World Archaeology Institute at the University of East Anglia.

Welcome



It's time for a new archaeology magazine. A magazine that will cover archaeology world wide. A magazine that will cover all periods from the first emergence of human beings down to the present day. A magazine that will be for everyone, whether beginners, seasoned enthusiasts, or indeed for the most learned academics. For the past 35 years, we have been covering archaeology in Britain in *Current Archaeology*, which now has a circulation of almost 20,000 subscribers. Now it is time to look at the rest of the world in a sister magazine that will appear in the alternate months to *Current Archaeology*.

Current World Archaeology will follow the same principles which have proved so successful in *Current Archaeology*. There will be an emphasis on new discoveries – with a special emphasis on excavations, finding out what has been dug up from around the world. We will also continue to tell stories, reporting on what has been found, why the excavation took place, who has made the discoveries, and how they fit in to the established picture.

In this, our first issue, we cover the world. There are two very different towns, Amarna the best preserved town of Ancient Egypt, and La Milpa a newly discovered Mayan town in Central America; and what a fascinating contrast they make! There are also two classic sites to revisit. Troy has been the subject of a fierce recent controversy: just how big was it? We lay out the evidence from the rival claimants. Then we cross the world to look at Angkor

Wat: just what were its origins?

Then in an article of which we are particularly proud, we ask the question, where is the oldest pottery in the world? The answer is Japan and here you will learn about not only the recent discoveries, but also go into the problems of the calibration of radiocarbon dating.

Finally, one article in each issue will look at a classic tourist site and re-evaluate it. We start with Ephesus and look at the fantastic new cover building that has been constructed to display an entire insula of the classical town.

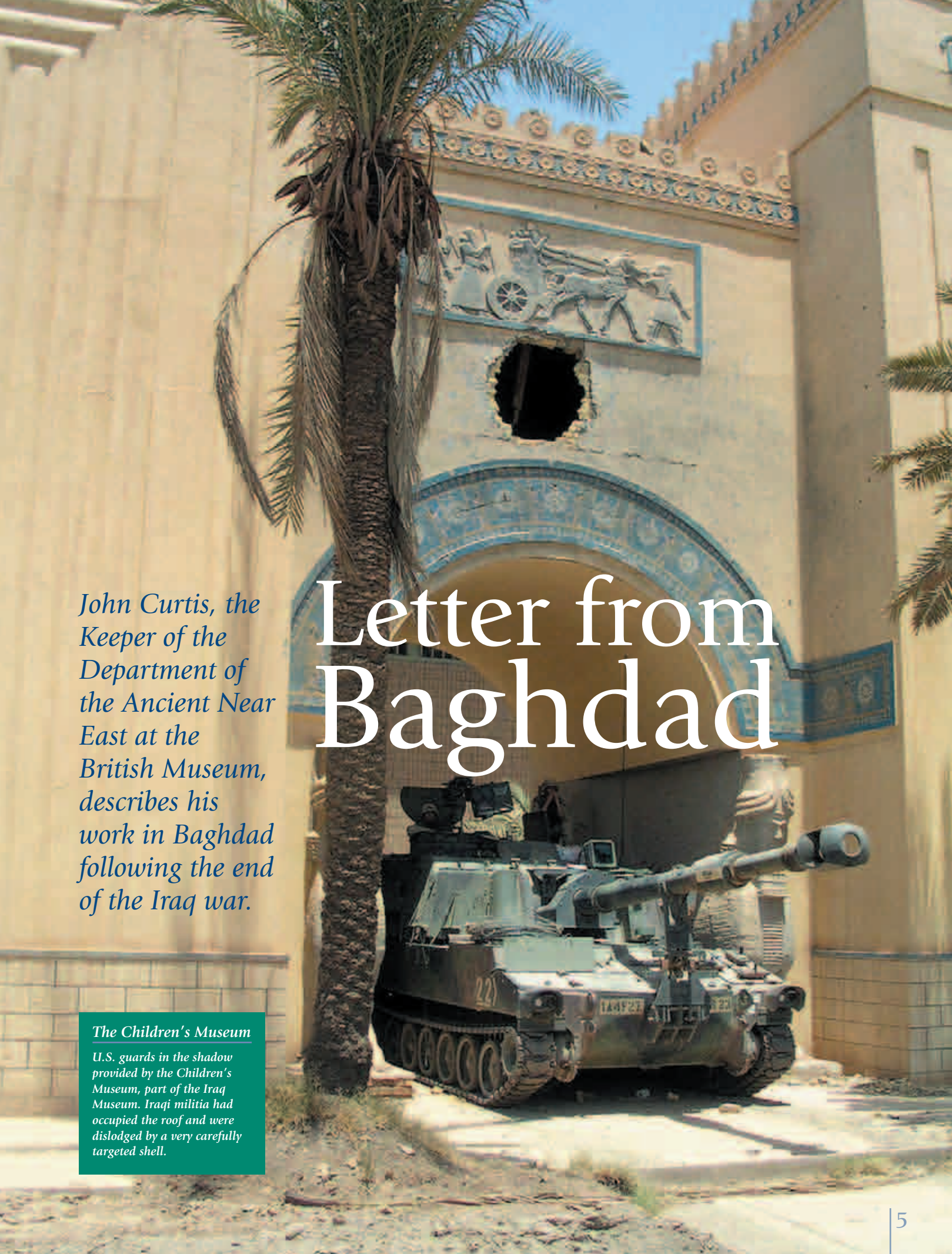
This first issue of *Current World Archaeology* is being distributed as widely as possible. 100,000 copies have been printed and if you have received more than one copy, you are obviously very popular – but please pass on the additional copies to your friends. If you would like some additional copies to distribute to your friends, or members of your class or society, please let us know – we have plenty of copies still in stock.

Finally, remember to subscribe. For a short time, we are making a special half price, bargain offer of just £10 for the first year's issues. You can subscribe on the internet – visit our site at www.archaeology.co.uk – by ringing us up with your credit card to hand, or even by good old fashioned snail mail.

But don't delay – we are looking forward to hearing from you, now!

Andrew Selkirk

Editor

A photograph of a U.S. M1 Abrams tank in front of a damaged building. The building has a large bullet hole in its wall and a palm tree in the foreground. The tank is positioned in front of an arched entrance. The scene is set in a desert environment under a clear blue sky.

John Curtis, the Keeper of the Department of the Ancient Near East at the British Museum, describes his work in Baghdad following the end of the Iraq war.

The Children's Museum

U.S. guards in the shadow provided by the Children's Museum, part of the Iraq Museum. Iraqi militia had occupied the roof and were dislodged by a very carefully targeted shell.

Letter from Baghdad



John Curtis, the Keeper of the Department of the Ancient Near East at the British Museum,

has been at the heart of the Iraq crisis. Following the end of the Iraq war, the Baghdad museum was looted, and in this interview, he describes what he, and the British Museum, has been doing to help.

For the last four months, my life has been dominated by Baghdad and the Iraq crisis. I have been out there twice, once for a week and once for a fortnight, but much of my intervening time has been taken up by the crisis.

It all really began on April 15th when we had a big press conference here at the British Museum to launch our celebrations for the Museum's 250th anniversary. However, this was only a week after the sudden collapse of the former regime and only three days after the news had broken in the west that the Baghdad museum had been looted. Thus, inevitably, the whole press conference was hijacked by the Iraq crisis. At the end of the press conference, Channel 4 News arranged a satellite phone link between me and Donny George which was broadcast here and all round the world.

Donny George is an old friend. He is the Director of Research in the Iraq Department of Antiquities, speaks very good English and has a natural talent for being a spokesperson. This was the first contact there had been with somebody in the Iraqi museums and he was able to tell us on the telephone of the scale of the crisis. It was immediately determined that I would go out as soon as possible – which I did.

Neil MacGregor, the British Museum's new Director was very quick to take the initiative on this and he felt straight away that the Museum was well placed to take a leading role in this crisis. We had longstanding relations with our colleagues in the Iraq Museum and we have a range of specialisms here, not only on the curatorial but also on the conservation side. Fortunately two anonymous foundations immediately offered us grants for our work, so it has not come out of the Government's grant-in-aid.

The first time I went out there was in April, and I was soon able to confirm the full extent of the crisis. Most of the material in the Iraq Museum had been taken off-exhibition in good time and sent into safe storage. What had been left behind in the exhibition halls consisted of pieces that were



Scene of desolation in the public galleries. Note that the head had been looted from the seated statue.



Donny George, Helen McDonald, and Colonel Bruce in Babylon.

difficult to move because they were too heavy, or because they were fixed into their bases, or they were too fragile to move. It was clear straight away that 40 of these major and important objects had been stolen.

In addition, the thieves had been all through the storerooms. There was some talk right at the beginning that 170,000 items had been stolen, but this was simply a misunderstanding based on the fact that there were 170,000 registered objects in the collection, and some one made the rash assumption that all had been stolen. We now know that around 13,000 items are missing, of which nearly 5000 are cylinder seals. The American military have made major efforts to recover these, and seven of the exhibition items have in fact been recovered, including the most important of all – the Warka Vase from Uruk dating to some time before 3000 BC and probably the most important monument of this early civilisation.

On the basis of this visit we had an idea of the scale of the problem and the first thing we did was to send out Sarah Collins to be a member of ORHA, the Office for Reconstruction and Humanitarian Assistance; this is the organisation



One of more than 120 looted offices. Until the file cards are sorted it will be very difficult to say what is missing.



The bronze gates of Ashurnasirpal II found at Balawat in 1956. The wooden gates are a modern replica; but many of the bronze plates that covered them have been ripped off. The numbers in white indicate where the missing pieces were.

that the CPA (the Coalition Provisional Authority) has established to govern Iraq. The cultural section is very small, only about half a dozen people in all, headed by an Italian called Ambassador Pietro Cordone. Fortunately, Sarah Collins, who is Curator in the Department, speaks good Arabic and has been at the heart of dealing with cultural matters in Iraq. She has been joined by Helen MacDonald of the British School of Archaeology in Iraq, who is now based near Babylon.

My second visit to Baghdad was for two weeks in the second half of June when I went out with three colleagues from the British Museum. We flew out on the 11th June to Amman and then drove overland to Baghdad. We spent four days in Baghdad working at the museum and having meetings with museum officials and Ambassador Cordone. One day we went to Babylon which was relatively unscathed, though the gift shop had been looted and set on fire. Then we went to Mosul where we visited the complex of eight of Saddam's palaces, all of which had been comprehensively looted. We visited Nimrud which had come off relatively lightly, though two reliefs had been stolen. And then on to Nineveh where Sennacherib's palace was found to be in an appalling state, though not all the vandalism was recent. Back in Mosul, we visited the university where the offices had been extensively looted and a number of books stolen from the libraries, and then to Mosul Museum, where as at Baghdad most of the exhibition objects had been removed before the war, but a number of the larger objects had been left and had been smashed.

I was particularly sad to see that the bronze gates of Ashurnasirpal II found at Balawat in 1956

had been looted; these had been restored by being fastened to modern wooden replica gates, but many of the pieces of decorated bronze had been ripped off the wooden door leaves, though two pieces were later retrieved from the museum garden. We went back to Nineveh where the dig house was found to be in good condition. Finally, we returned to Baghdad whence we flew to Amman in a United Nations plane and eventually on the 26th June returned to London.

Visiting Iraq has not been my only concern. I have also been to conferences in New York, Bonn and Paris and of course here in the UK. Most recently I have been to Tokyo, to the third UNESCO conference where it was unanimously recommended that all the offers to help restore the Iraqi heritage should be co-ordinated by UNESCO. We at the BM are entirely supportive of that proposal; we think it is the best way forward, and in the interim period we are doing what we can.

Although the Americans are happy for other members of the coalition to play an important role in cultural affairs, it does become very difficult to disentangle cultural from military affairs. This is particularly the case with looking after the sites down in the south of the country where sites are being looted and require military guards. The position as regards archaeological sites is very gloomy; there has been very, very extensive looting at some of the sites, notably at Nippur, Isin and Umma. At Isin a National Geographic team reported that almost 300 diggers came up to their helicopter, waving, and were surprised that the Americans would think that they were engaged in wrongful activities.

It is also American military officials who have



Top, A somewhat unconvincing soldier: John Curtis wearing body armour.

Above, A rather more convincing museum curator. John Curtis with Donny George examining a damaged statue.

Report by Col Bogdanos

Colonel Matthew Bogdanos is a colonel in the US marine corps and is responsible for investigating the thefts from the Baghdad Museum. He is in fact a reservist, after a career in the marines during which time he was sent to Columbia University to read classical studies. (His father was a Greek restaurateur in Manhattan, so he was brought up on Homer.) He has since been a district attorney in New York and has spent the last 13 years of his life in law enforcement. Following September 11 he was recalled and is now enforcing law in Baghdad Museum. This account is based on a report he gave to the *Rencontre Assyriologique* in London.

A beheaded lion from Tell Harmal c. 1800 BC.



Colonel Bogdanos said: "I am a marine. I expect to recover these items no matter how long it takes. To those who have taken those items, my message is simple: we will find you no matter how long it takes, and no matter where you are; we will find you and we will recover this property".

In order to recover the items, the team has used a multi-pronged approach. Firstly, they had to determine what was missing, which was a Herculean task as the offices had been looted, the records upturned, so it was impossible to be certain of what was there in the first place.

Secondly, they had to disseminate photographs of specific objects so they could be recognised and seized.

Thirdly, they had to develop an amnesty policy, putting out the word that anyone could return items without any fear of retribution or prosecution.

And finally, they had to develop confidential sources in the Baghdad community and carry out restorative raids.

Many of the objects had been moved to various secure locations. The most valuable objects, particularly those of gold, had been deposited in the vaults of the central bank.

Unfortunately, these had flooded, but a National Geographic team had pumped the vaults out recovering millions of dinars of wet currency and the boxes of precious gold and jewellery – which all proved to be in good condition. The manuscripts had been moved to a bomb shelter in western Baghdad and 179 boxes containing 8366 artifacts were carried to a secret place, a storeroom which five members of the Museum had taken an oath not to divulge until Iraq had a lawful government. Bogdanos had seen it and had given his word not to divulge its location. All these objects appeared to be safe.

The Museum itself had been ransacked. One of the problems was that in the perception of the populace the Museum was associated with the Ba'athist regime, thus every office was damaged,

every door was broken, every computer was stolen. This was 'angry theft', similar to that in the presidential palaces.

There was a different type of destruction in the public galleries. The looters seemed to fall into three categories which may well overlap. In the public galleries the thieves who stole 40 objects were selective and discriminating, avoiding casts and choosing the valuable items. Of the 451 display cases, only 28 were smashed - three of which had contained important objects, while most of the rest were empty. Forty objects were stolen, of which ten have been recovered.

The second category was the looting in the Old Magazines. This seems to have been indiscriminate and random, with the contents of shelves swept into bags, and copies and forgeries stolen. The Old Magazines were sealed by a 12" steel door which had not been breached. However, a door leading onto a back alleyway had been opened but was unforced. The keys to these unforced doors were last seen in the Director's safe and are now missing. Presumably someone had gone to the safe and taken these keys knowing that they were the keys to the back door. It could have been done by the Iraqi army: it appears that a firing position had been established on the upper floor.

The third category consisted of the New Magazines, an annex built in 1986. Only one of the five stores had been opened, but it is here that the major looting took place. The Magazines were looted by people with an intimate insiders' knowledge. There were 30 storage cabinets containing half the cylinder seal collection and the coin collection; these were not looted because the looters had dropped the keys and could not find them. 4795 cylinder seals and 4997 other pieces were stolen from boxes on top of the cupboards. The thieves must have had an intimate knowledge of the museum and its storage practices and have known where the well hidden keys were kept. A total of 10,337 objects were stolen, of which 671 have just been recovered. Fortunately the clay tablets were not located, and are all safe.

In all, nearly 3000 pieces have been recovered so far, most of them stolen from the Old Magazines. Of these just under half were returned as part of the amnesty programme, and just over half, (1591) were recovered by law enforcement techniques, such as raids, checkpoints and seizures. A further 679 pieces had been seized in Jordan, Italy, the UK and the US. A little more than 10,500 pieces are still missing.

(This report was adapted from the British Museum's website)



been involved in policing the Iraq museum, ascertaining the scale of the losses and setting in place mechanisms for trying to retrieve stolen objects. A lot of that involves liaising with Interpol and police organisations.

It is perhaps important to put the Baghdad Museum into perspective. It was founded soon after Iraq became independent in 1919 and it is one of the finest museums of the Middle East, and undoubtedly contains the finest collection of Mesopotamian antiquities in the world: all the finest material discovered since 1919, or at least the bulk of it, has been put into the museum, which is full of spectacular and iconic pieces.

It is extremely unfortunate that in some parts of the media accusations have been levelled against the integrity of the Museum staff, but I see no reason whatever to doubt their honesty and I am quite sure myself that they were not involved in the looting. Indeed, I feel that Iraq has a better record than almost any other country in the Middle East in looking after its cultural heritage, at least until the start of sanctions in 1990. There has been some pressure from America to change some of their antiquities laws, but it has not happened, rightly in my opinion. The present antiquity law which has been in force since 1971 prohibits the export of all antiquities from Iraq.

Following our second visit to Iraq in June we drew up a long conservation report and a series of recommendations. They can all be found on the British Museum website, www.thebritishmuseum.ac.uk – click on News and then Iraq crisis. The plan was that four conservators from Iraq Museum should come here in the hot summer months of August and September and that an international team of eight people will go out to Iraq in October to do some or most of the emergency conservation work. That was the plan, but so far, the four Iraqi conservators have not been able to come here because they do not have passports or travel documents - the Coalition Provisional Authority has not yet put in place a system for giving people travel documents; we live in hope.



The Warka vase (left) is perhaps the finest piece of early Sumerian art. It was stolen, but fortunately it has been recovered, returned in the blue trunk (far left). It is complete, although broken along old breaks that had been repaired before 3000 BC (copper bands once linked the different pieces).

Photo: akg-images/Erich Lessing.



Left – Muzahim Mahmoud showing where looters tried to remove a relief fragment and damaged another. Nimrud, 9th century BC.



Below left – The corrugated iron roof that covered the South West palace of Sennacherib (Nineveh, early 7th century BC) has been stripped, and the area looted. The photo shows part of the Throne Room Suite, with stone fragments at the foot of the wall. Not all of the damage is recent, since the Palace was badly burnt in 612 BC and has been in poor condition in more recent times. However, a fragment of the Assyrian frieze on the right, was levered off by the looters. There is a gap between the modern wall and the Assyrian relief panels – which are standing on their bases – and this has helped cause weather damage.

But all going well, I will go out again at the beginning of October when the international team of conservators go out. That is the plan, and I hope that next year UNESCO will be taking a fuller role in co-ordinating the task of getting the Iraq Museum back together again. The British Museum will continue to give all the help we can.



Letter from Jerusalem

The premises of the Kenyon Institute in Jerusalem is situated in a converted Ottoman period building in East Jerusalem. This was formerly the British School of Archaeology in Jerusalem, but though the School has been closed down, the premises have now re-emerged as the Kenyon Institute.

Jerusalem is a hotspot, not least archaeologically, and the region has been intensely explored by travellers and archaeologists. During the last century archaeological work has been carried out with the permission of successive, or sometimes parallel, government departments, Ottoman, British Mandate, Israeli, Jordanian and Palestine administrations. Under these administrations, French, Italian, British, American, German, Spanish and other foreign institutions and scholars have made tremendous contributions to the archaeological record – the study of the Palaeolithic and Mesolithic of Mt Carmel, and contributing to the recovery of the Dead Sea Scrolls being two of the most remarkable – but all institutions today suffer increasingly from financial problems as well as the political pressures.

Some of the foreign institutions, mostly British, have faced or are facing closure. The Israel Antiquities Authority has enormous commitments to the developer-led rescue archaeology, with huge backlogs of publication and ever growing warehousing problems. University-led research projects

with student input continue, but the paying-volunteer work force from abroad is inevitably affected by political events. Major Israeli archaeological research projects have been going forward at Megiddo and Hazor, and there is huge input at the major tourist sites, such as Acre and Beth Shean, but the Palestinian Department of Archaeology struggles to survive, and its joint projects with the French, British and Swedish expeditions in the Gaza strip have been curtailed or postponed. Particularly interesting and important discoveries have been made at the ancient port of Anthedon (Blakhiyah).

The Kenyon Institute

The British School of Archaeology in Jerusalem, founded in 1919 and re-established in Jerusalem by Kathleen Kenyon in 1952/3, was merged with the British Institute at Amman in 1999 as the Council for British Research in the Levant. The CBRL is still an educational charity, with members who continue to use the library and hostel as an invaluable research base for an increasingly wide range of

subjects under the humanities umbrella; but maintaining building and library will require considerable fund-raising. This year, as a memorial to Kathleen Kenyon, CBRL's Jerusalem regional office has been renamed the Kenyon Institute. The new name celebrates not just Kenyon's success in re-establishing an institution which has played a role in training generations of students (many were, or are, currently in post in British universities), but also the fine projects she directed at Jericho and Jerusalem and the impact they had on Near Eastern archaeology in the 1950s and 1960s.

Although some may regret the loss of the old name, the Kenyon Institute contributes to the broadening scope of research by the CBRL under the aegis of the British Academy. Research is no longer purely archaeological, or archaeology related, but recent archaeological activities which have been supported include: the recording of the medieval core of a Palestinian village; work on the publication of the BSAJ/Tel Aviv University excavations at Iron Age, Byzantine and medieval Tel Jezreel; the publication of the first volume of the Medieval and Ottoman survey of medieval Muslim buildings in Palestine; the Leverhulme Trust and a generous donor have supported the ongoing publication of Kenyon's Jerusalem excavations. In addition there are current projects on language, identity, cultural and heritage issues. Research and publication (of newsletter, journal and monographs) remains a priority, but political events have had considerable impact on field projects.

Source:

Kay Prag directs the Ancient Jerusalem project at the Manchester Museum.



Amarna

What did an Egyptian city look like?

A flotilla of boats is just leaving the river frontage of the Great Palace, and is heading downstream following the current and propelled by oars. Behind it, the Great Palace is laid out parallel to the river, with the main entrance to the left.

The statue of Queen Nefertiti, right, one of the most famous examples of Egyptian art, found in the house of the sculptor, Thutmose.



Photo: Bob Partridge

Plan of the city, as shown on the model.

- 1 the Great Aten Temple, with huge enclosure, still mostly empty.
- 2 the Small Aten Temple.
- 3 the Great Palace, oriented parallel to the river.
- 4 the King's House, linked to the Great Palace by a bridge over the Royal Road – which runs to the left.
- 5 the Civil Service Quarter, where the Amarna tablets were found.
- 6 the Police Headquarters.
- 7 the South suburb.
- 8 the House of Tuthmose, the sculptor.



This view of Amarna gives a good indication of what the site looks like today. It is taken from the northern heights looking south. In the foreground is the northern suburb and the northern palaces still standing out in the desert. Then comes the wide band of green - the fertile cultivated land, which covers much of the warehouse area of the ancient city. Beyond that is the Nile with the fertile land on the other side where much of the modern development has taken place.

The best surviving example of an ancient Egyptian city is Amarna. This was a very short-lived city, laid out by the 'heretic' Pharaoh, Akhenaten, who did everything differently. He renounced the multiplicity of Egyptian gods in favour of a single god, Aten, whom he identified with the sun. But above all he abandoned the ancient city of Thebes (Luxor) and set up a new city at Amarna, 200 miles to the north, halfway between Thebes and the northern capital of Memphis, just outside modern Cairo. The city was laid out on a grand scale; but there was one big disadvantage: on his death, the former elite could not wait to bring the royal power back to the old centres of power, and after only 20 years of existence, Amarna was abandoned.

Archaeologically, this is a great advantage: it means that we are dealing with a one-period site. Furthermore, the site that he chose was an unpromising location and consequently no one



Overall plan of Amarna – the model covers the central city and the nearer half of the southern suburb. However, the Pharaoh probably lived in the North Riverside Palace, from which the Royal Road ran through the North Suburb to the Central City. Note the north tombs at the top. Most of the agricultural land was on the other side of the River Nile, to the left.

Further Details

Amarna lies about 220 miles south of Cairo. Since tourist ships no longer go from Cairo to Luxor, it is no longer visited as much as it once was: the best way to get there is by train to el-Minia, Deir Mawas, or Mallawi.

has since wanted to build a city there, and thus today it is a virgin site, unencumbered by modern settlement.

Barry Kemp, Reader in Egyptology at Cambridge, has been digging at Amarna since 1977. His first project was to map the whole site and to put all the previous excavations on a single plan. It was an immense undertaking, particularly in the days of theodolites and surveyor's chains, but it roused his interest in how the city 'worked' and how the various parts fitted together.

On the ground, Amarna tends to be rather disappointing. "If you go there hoping to walk down an Egyptian street, you'll be let down. The landscape is very much that of an excavator's spoil-heap. You can see walls appearing here and there - but the excavated areas have not fared all that well. They were cleared of their sand and rubble, in huge areas, and then just left: any streets and open spaces were often used for places to heap the spoil. So when you go, it has an undulating landscape, mainly of spoil-heaps, and the houses are down in the depressions. But it still looks beautiful from the air. We have a low-level helium balloon with a camera attached to take lovely pictures of the buildings. But when you visit it's quite hard to get

the sense of a real city. You only get that sense by looking at plans or a model".

Thus when in 1999, a grand exhibition of the Art of Amarna was prepared at Boston University, Barry Kemp suggested they work with Michael Mallinson, an architect, who came up with the idea of making

a model. They constructed the model in an architect's model factory in Clapham. "During that summer I went down on a nearly daily basis to consult Michael and the model makers. We had to work within a tight budget which prevented changes of mind. There were areas that had been destroyed and we had to fill them in a plausible way. One major problem was that it is normal for architectural models to present the architect's design in the best light and thus to show it clean and new. The mud brick, of which much of Amarna was built, wears and erodes easily. We therefore decided to distress the model a little, by

dirtying the surfaces of the walls and the roofs of the houses, as well as the surrounding ground, but we did not have time to distress it as much as we would like. It still looks a little too neat and clean."

The model was a great success. It went from Boston to Chicago and Los Angeles and finally to Leiden. It was then shipped to Egypt where it is currently disassembled in a storehouse across the river from Amarna, ready for when a new visitor centre is built on the site. What does the city look like when reconstructed?

The model of the city can be divided into three main areas: there is the Central City to the left of the plan that contains the formal palaces and the two great temples, while behind it lay the jumbled mass of the civil service area, and beyond that (6) the police station with parking space for the chariots in which they zoomed round the city.

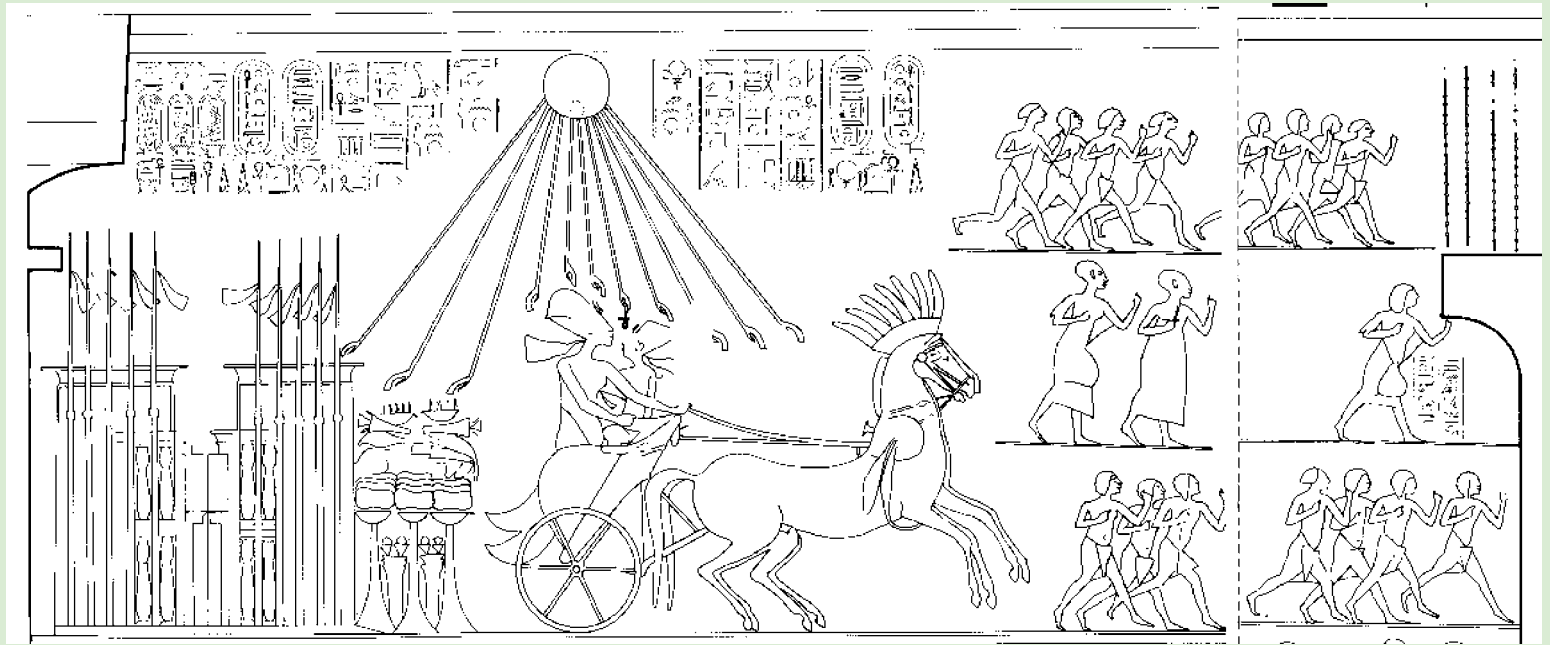
Then, stretched along the Nile itself, were the great areas of warehouses where produce could be stored for redistribution by the Pharaoh. Behind that, green on the plan, is the southern suburb where the people and indeed the higher officials actually lived.

However, the model is not of the entire city; the palaces where the Pharaoh and his queen (probably) lived lay some distance to the north (the North palace and North Riverside Palace) and were linked to the Central Palace by the Royal Road. Carved scenes in the tombs show the Pharaoh making his royal progress in a procession along the Royal Road, with his officials running beside him. Between the two palaces was another suburb known as the North Suburb.

And then there were the tombs. A mile or so inland were some low cliffs into which officials were encouraged to cut their tombs. None of these were actually finished but as soon as the front sections were hewn out, the decorators moved in and the walls were thus covered with engravings. Indeed these engravings are among the most remarkable monuments of Egyptian art, for they are done in a far more lively style than that of the traditional paintings, giving many details of everyday life. Indeed it is these details that provide a lot of the evidence for the reconstruction that is shown in the model: much of this detailed evidence is given on the web site.

Then across the river lay the agricultural lands from which the city was fed. When the city was





first laid out, Akhenaten set up four boundary stones to mark the limits of the city, and these reveal that nearly three-quarters of the total area of the city consisted of the agricultural land on the west bank. The city on the east bank was only a small part of the total area.

The city was not in use for long. Akhenaten came to power in 1358 and it was only in the fifth year of his reign that he decided to abandon Luxor and to found a new city at Amarna. He only lived on for a further 13 years, and his death in 1340 was followed by a somewhat chaotic period of a very minor Pharaoh called Tutankhamen. However, it appears that almost immediately, the court took up residence again in Memphis and Thebes. Amarna was not totally abandoned straightaway, indeed some parts continued to be occupied for a further ten or even twenty years, but the total time from foundation to abandonment was probably no longer than 30 years.

Akhenaten remains a controversial and exciting figure. On his death he suffered *damnatio memoriae* and his name was removed from the official records, so that the early scholars knew nothing of his existence. Gradually, the tombs were discovered with their remarkably fresh art, then the city itself began to be uncovered and the whole story of Akhenaten began to emerge. Inevitably everyone has their own views of Akhenaten and his experiment: many have been attracted to see him as a great religious reformer, introducing

monotheism and becoming a forerunner of Christianity. Barry Kemp is a little more sceptical. Many of Akhenaten's ideas, such as the predominance of the sky-god had already become commonplace in Egyptian religion. However, in the scenes carved on the tomb walls, the Pharaoh is omnipresent and it may be that the reason why Akhenaten and his religion were forgotten so quickly and so comprehensively is that the nobles and the people wanted to pay a little bit more attention to the old traditions and the priests and the bureaucrats – and a little less attention to what appeared to be the rule of just one man.

The royal chariot drive. Akhenaten and Nefertiti in a chariot leave one of the Aten temples, left, represented as a pylon entrance with flag-poles. They are accompanied by a running bodyguard, headed by the chief-of-police, Mahu.

The scene is preserved in Mahu's tomb, and Mahu would please like you to take note of him: he is the one in front, with a label attached.

AMARNA Time Line

5500 – 3100 BC	Predynastic Period (c. 3300: towns develop along the Nile)
3100 – 2686	Early Dynastic Period (c. 3000: hieroglyphs develop)
2686 – 2181	Old Kingdom (Pyramids built – Great Pyramid of Khufu built 2550)
2181 – 2055	First Intermediate Period
2055 – 1650	Middle Kingdom
1650 – 1550	Second Intermediate Period
1550 – 1069	New Kingdom (c. 1363: Egyptian capital moves to Amarna) (c. 1333 – 1323: reign of Tutankhamen)
1069 – 747	Third Intermediate Period
747 – 332	Late Period (c. 200 BC: Rosetta Stone)
332 – 32	Ptolemaic Period (48 BC: Cleopatra becomes ruler of Egypt)

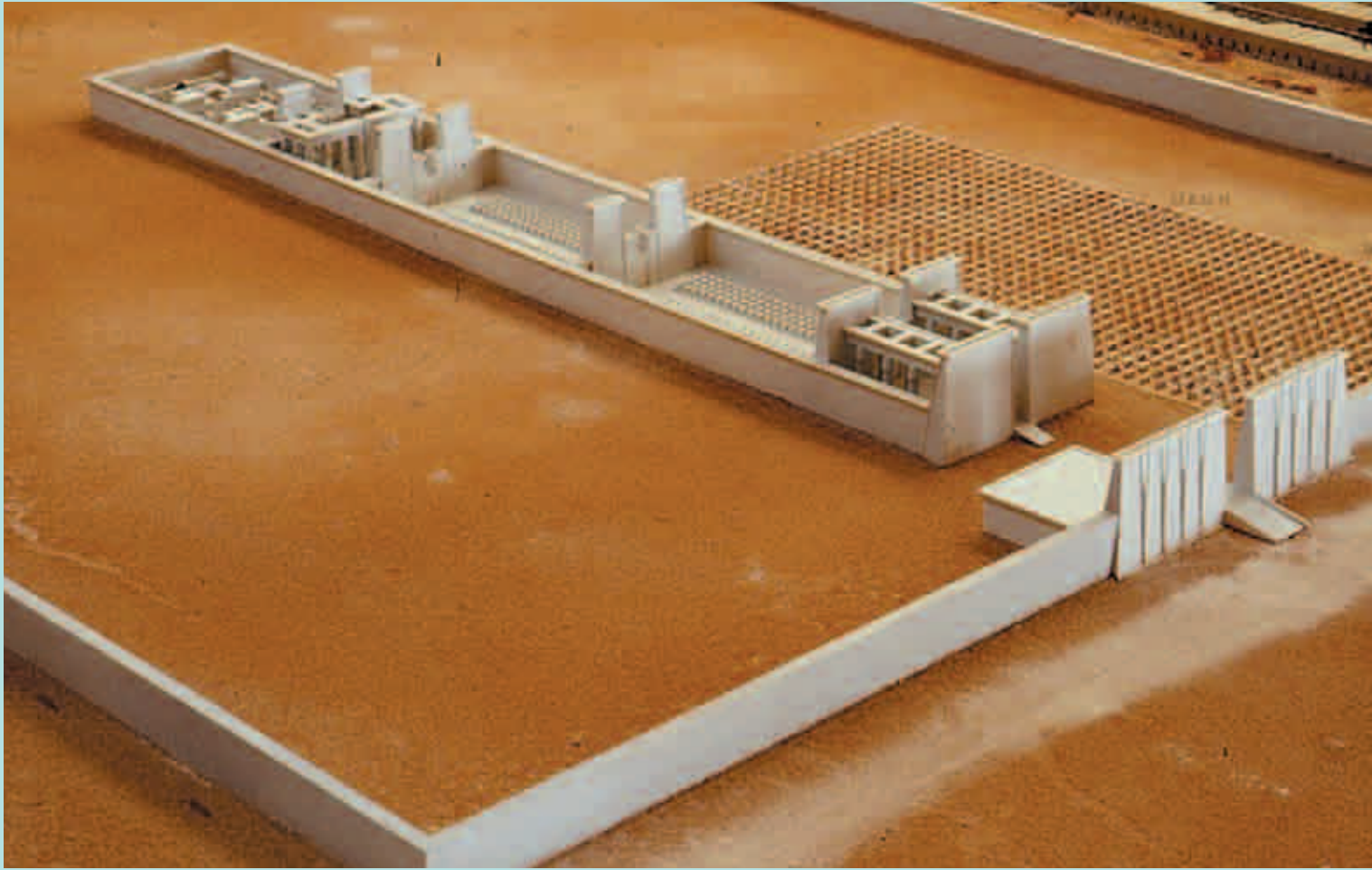


Palaces

This general view of the model shows quite clearly the distinction between the official buildings, in white (bottom right), and the mass of unofficial buildings, painted mud-colour, in the southern suburb sprawling along the main roads of the top. The Nile runs across the top right. However, the official landing-place is bottom right, which reveals the dual axis of the main building. Turn right and you enter the King's Palace, passing through two huge courtyards. However, if on landing you go directly ahead, you come to the huge Aten Temple, of which only a corner is visible – but see opposite. From the King's Palace, a bridge crosses the north-south road to a building called The King's House, which is probably the nearest approach to the king's private residence. Behind that again, the scatter of buildings is what has been called 'the typists' pool', where the scribes lived and worked. It was here that the famous Amarna letters were found, written in a cuneiform script and sent to and from the rulers of Babylon and Mitanni among others. Beyond that again is another mass of buildings that were probably the police barracks. In the L-shape of the barracks is a triangular red heap that has been called the palace rubbish dump. It was here that sherds of Mycenaean pottery were found that provide the crucial peg for dating all Mycenaean pottery.

Above – The Great Palace. The entrance is at the bottom, through two courtyards, to the buildings beyond. To the right is the ceremonial quay. To the left, a bridge crosses over the Royal Road to the King's House, which is where the royal ceremonies took place and gifts were given out through the Window of Appearance.





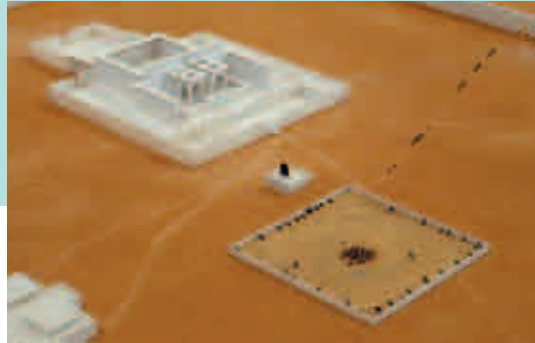
Temples

Here is the front portion of the Great Aten Temple. Much of its huge enclosure seems to have been empty. However, note to the right a huge series of over 900 offering-tables.

The main stone temple is dominated by two courts separated by pylons. Each court filled with offering tables, but note that in the inner sanctum (top left), the rooms deliberately have no roof. Instead of the dark mysteries of the old religion, in the new religion of Akhenaten, everything had to be open to the rays of the sun.

Right – Here we see the rear portion of the Great Aten Temple, which was made of mud brick and probably whitewashed. There is a stone temple on the axis, seemingly a compressed version of the large temple. However, note the huge enclosure at the centre. This is the cattle slaughter court, with cattle tethered round the edges awaiting their fate, and the bloody slaughter area at the centre.

Note too the groups of cattle being brought in from the gate-way on the top right hand corner. Between the cattle slaughter court and the temple stood a huge quartzite tablet that bore a list of offerings. You could not come into the temple, without bringing your sacred cow to be slaughtered.



Left, below – An essential part of an Egyptian temple: the bread-making ovens. Just outside the south wall of the main Aten temple were these rows of bread-making ovens, where bread was produced in industrial quantities. Each of these two long narrow buildings was subdivided into numerous bread-making kitchens, with a bank of ovens at one end. Each loaf was made in an individual clay mould, and piles of the broken moulds can be seen as brown splodges outside each factory door.



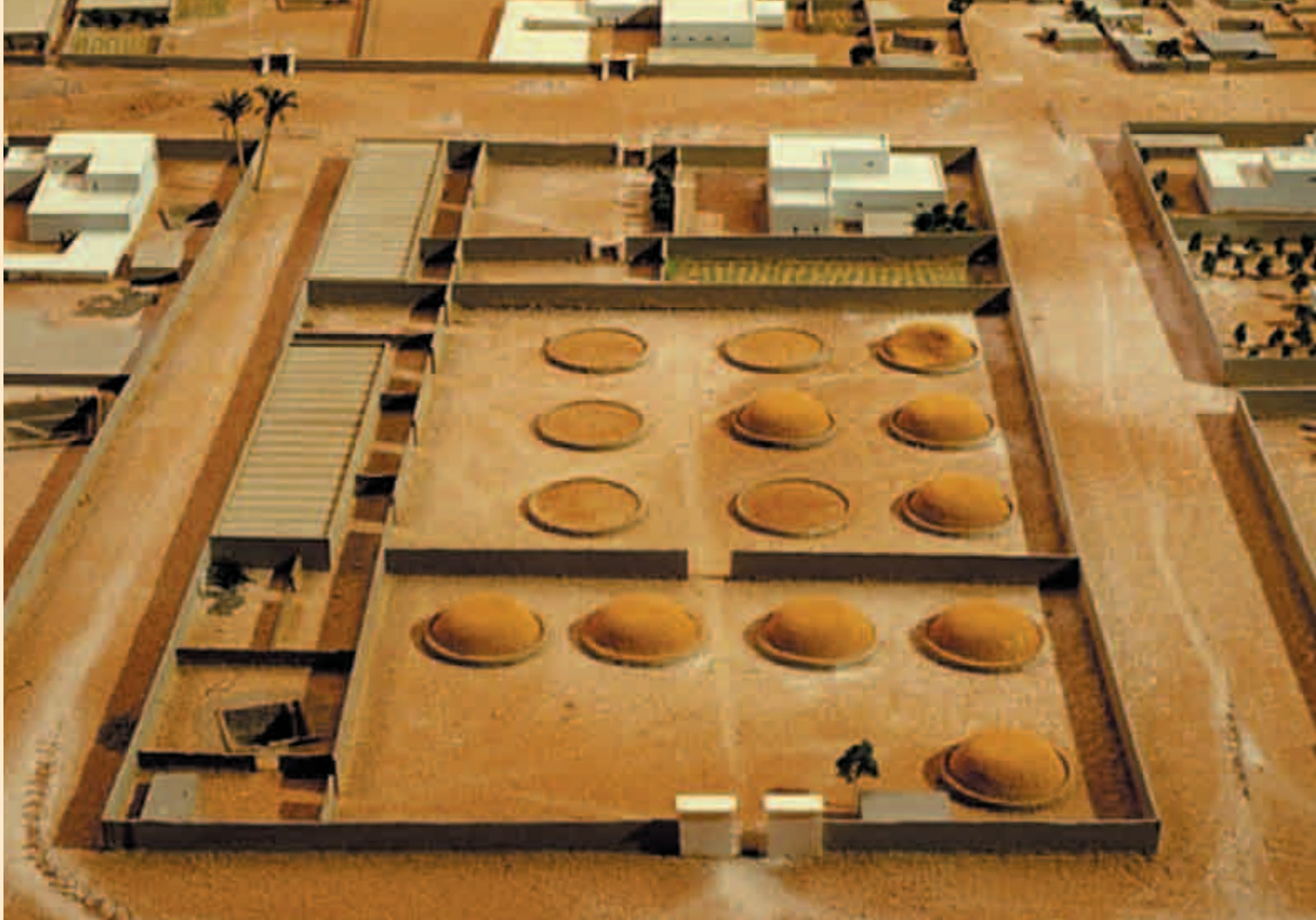
Warehouses

The real heart of an Egyptian city was the storehouses. The whole block of the city next to the palaces (top) between the Nile (left) and the town houses (right) were the rows of store houses. At the very bottom are the green market gardens, then the first of the storehouses are groves for producing fruit. Then come the heaps of wheat and barley, then the timber stores, beyond that the glass-works and potteries (see opposite), and beyond that the wine and beer stores.

Many of the details here are uncertain as the sites have been eroded by the river; thus many of the details have been included by reference to carved scenes in the tombs.

Below left – The centre of the city. To the left is the main palace, already discussed. Adjacent to it is the Small Aten Temple (not otherwise discussed). Then to the right is the beginning of the rows of storehouses, these are in fact the best known parts of the storehouses as they have been excavated by the Egypt Exploration Society from 1991 to 1999. Only the bottom 10cm of the foundations had survived, but these revealed the general layout. Some may have been for storing wine and beer, others perform more generalised functions.





Grain was brought into the city in huge quantities for redistribution, and one of the enclosures must have been given over to grain storage. The reconstruction is based on a scene in Meryra's tomb, where open heaps of grain are shown, stored on floors with raised rims, prior to dispatch for more secure storage at the many other granaries within the city. To the left, two banks of warehouses with barrel-vaulted roofs are shown.

Right – The cattle enclosure lies beside the river bank (as reconstructed from Meryra's tomb scene). Cattle are brought by the boatload and led to the middle enclosure where they are tethered in rows for final fattening before slaughter.

The adjacent enclosure to the right is a store for newly-made pottery storage jars. The larger vessels, some of red and some of cream fabric, stand in rows, while the smaller reddish pots are stacked up – as represented by the dense areas of red. Behind, surrounded by black charcoal, are the kilns.

The tall cylindrical kilns produced the pots. Those with low domes were for glass and glazing (as revealed by recent excavation), and turned out items like blue glass ingots made in shallow cylindrical moulds.

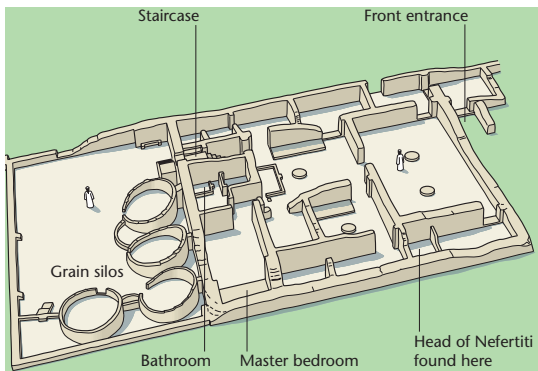




Suburbia

Left – The main road out of Amarna. The king’s house and the smaller of the great temples can be seen top left, but the suburb itself is more like the shanty towns of poor, modern countries, with little regularity and the houses spread only approximately along the line of the road. Small houses like the three at the bottom right jostle with much larger compounds, and frequently the main houses are set well back from the front.

Top right - This photo is taken from a balloon - the tethering rope crosses the photo. It shows the house of the sculptor, Thutmose, excavated by the German Expedition in the years before 1914. Photo, Barry Kemp, courtesy of the Egypt Exploration Society.



This is perhaps the most famous of all the houses at Amarna, being the house of the sculptor, Thutmose, and many of the most famous sculptures were found in his workshop, notably the statue of Queen Nefertiti (right), one of the most famous examples of Egyptian art. The main house is shown in white at the centre, the main rooms are shown as being two storey though of course there is no direct evidence for this. In the small courtyard directly behind the four domed shaped structures are granaries for storing emmer wheat and barley. The other main storage is bottom left in the low building with the corrugated roof, marking four barrel-vaulted storehouses. There is a large well in the courtyard, shown as circular with an entrance way down which the servants climbed the steps round the side of the well to get to the water at the bottom.



Amarna shows a city built at a time when society was half-way between creating cities as we understand them, and living in villages. There is a marked village-like character to the residential part of the city, which the model brings out very well. There are little neighbourhoods of irregular streets where the rich and poor live together. All were built with little regard to the overall shape of the city. Town planning in a regular grid is yet to come.

Source:
Barry Kemp, Reader in Egyptology, Cambridge University. Email: bjk2@cus.cam.ac.uk

Photos of the model:
David Grandorge

World Archaeology News

Oldest wheel found

Beneath an ancient marsh settlement near the Slovenian capital of Ljubljana, the Slovenian Academy of Arts and Sciences, have uncovered an ash and oak wheel, five centimetres thick, with a radius of 70 centimetres.

Dated to between 5,100 and 5,350 years ago, the wheel is 100 years older than the previous record-holders, discovered in Switzerland and Germany. Surprisingly, it is also relatively technically advanced, more so than some later examples found in Switzerland and Germany.

Digging abroad, Butrint. Siderola Golemi, Director of the training excavation, with a late Roman amphora.



Digging Abroad

Would you like to dig abroad? If you wish to dig in Britain, you can of course consult the Handbook of Archaeology which we publish free to *Current Archaeology* subscribers with the Spring issue. However, if you want to dig abroad, you should subscribe to *Archaeology Abroad*, which publishes two bulletins a year in April and November which contain upward of 1000 opportunities for volunteers, archaeology students, qualified archaeologists and specialists in a wide range of exciting projects world wide.

A number of field work awards are available annually to help subscribers with their field work expenses. Subscription rates are £14 for individuals and should be sent to: Archaeology Abroad (CWA), 31-34 Gordon Square, London WC1H 0PY, or visit their website at www.britarch.ac.uk/archabroad

Earliest evidence for chocolate

Scientific analysis of the residue on a spouted pottery 'teapot' has revealed that the Maya ate chocolate as far back as 600 BC. The Maya flourished in southern Mexico, the Yucatan, and the highlands of Belize between 500 BC and AD 1500, and this evidence pushing back the earliest known use of cacao by more than 1,000 years. This in turn implies that people were probably cultivating the cacao tree well before 2,500 years ago.

Archaeologists at the University of Texas at Austin, analysed 14 scraped residues from three teapots uncovered at the Mayan site Colha in Northern Belize. They were examined using "high performance liquid chromatography together with atmospheric-pressure chemical ionization mass spectrometry". This revealed the earliest chemical evidence for the ancient use of chocolate.

The Maya drink was thick and foamy: the 16th century Spanish invaders told how the Maya stood up as they poured the chocolate drink from one vessel to another on the ground; the drop, plus the rich cacao butter, created a thick head of dark, thick, chocolate foam - the prized part of the drink.

So long as the teapots are not washed, they can be analysed for ancient residues. However, the teapot is rare among Mayan ceramics, and is usually associated with elite burials. Indeed, in Maya murals and ceramics, hieroglyphs depict chocolate being poured for rulers and gods. Despite this, by the time the Spanish arrived in the 1500s AD, everyone - rich and poor alike, was seemingly drinking chocolate at every meal.

Papua New Guinea emerges as early agriculture pioneer

It used to be thought that Papua New Guinea was simply a passive recipient of domesticated plants and animals from Southeast Asia. However, new research indicates that the region was in fact one of the handful of places on Earth where agriculture first, independently, appeared.

This conclusion is supported by the archaeological analysis of plant residues found in the soil and on the plant tools uncovered in the Kuk Swamp excavation site in the Wahgi Valley. The analysis revealed that people were definitely exploiting plants – including the starchy tuber, taro – 10,000 years ago. This predates the earliest known Southeast Asian influence by about 3,000 years.

In addition to this new microscopic

plant evidence for early plant exploitation, the team have dated features related to planting, digging, and drainage systems to 10,000 years ago. This is clearly no Neolithic backwater, as previously thought.

By about 6,500 years ago, we have a clear picture of the agricultural setting of the Wahgi Valley as a valley floor carpeted in grasslands that were periodically burnt. Within cleared plots, on specially constructed mounds, the people grew bananas, sugar cane and yam. Taro filled the wetter ground between the mounds.

Finally, and unusually to this region, there is no evidence of the normal link between agriculture and the rise of civilisation as represented by urban centres and social and political classes.

Out of Africa

Scientists have discovered three 160,000 year-old human skulls in the Afar region of Ethiopia. The skulls are the oldest known (by some 30,000 years) and the best-preserved fossils of our immediate predecessors. Nearly complete, they are from a grown man, a child, and a second adult. They seem to represent the crucial stage of human evolution when our modern facial features developed. They do not have the projecting heavy-browed skulls of even older human skulls, rather they have a flattened face, reduced brow, and prominent forehead more akin to our own.

For palaeoarchaeologists, these skulls provide yet more evidence against the idea that modern humans originated both within and outside Africa. Instead, they provide the most compelling fossil evidence to date that we all originate from Africa.

Giant Elephants in Abu Dhabi

A two and-a-half metre long elephant tusk has been uncovered in the Western Region of Abu Dhabi. The largest elephant fossil of its type ever to be found in the Middle East, it dates to between six and eight million years ago, when the area was a forested Savannah with slow-moving rivers.

The find has proven to be doubly spectacular since it is also the first complete tusk found in the region.

The extreme fragility of the fossil meant that it needed special conservation attention. It was therefore treated with chemicals to prevent it from disintegrating, and then covered with a special foam before being moved to the city of Abu Dhabi where it is currently stored.



Indian Temple Complex gets World Heritage Status and New Lease of Life

A year ago, UNESCO designated the Mahabodhi Temple Complex at Bodhi Gaya, Eastern India, a World Heritage Site, and with this, the site is getting a new lease of life.

UNESCO deem the site a work of architectural genius. Its grand Mahabodhi Temple, dated to the 5th or 6th centuries AD, towers over the site at 50 metre high. Nearby lies the oldest temple in the complex. It dates back to the 3rd century BC, and is where Buddha is said to have attained Enlightenment under the Bodhi tree. Indeed it is this religious association that furthered the importance of the Complex: it is one of the four holy sites related to the life of Buddha.

However, until now the site had been falling into disrepair. Following its UNESCO designation, the Archaeological Survey of India have been undertaking massive new restoration and conservation work.

Ongoing restoration work includes rescuing areas of the site that are under threat from erosion.

The Boghgaya Temple Management Committee, who are working alongside the archaeologists, also seek to preserve the splendour and the integrity of the site. The Committee would like the entire area to be landscaped in order for it to become a tranquil destination for pilgrims, replete with lotus pond and meditation park. Intending the temple complex also to become an attractive tourist destination, the Committee are hoping to build an auditorium for plays and concerts, a boating lake and musical fountains. Hotels, good transport links, and the installation of tourist guides are also under discussion.

Those interested in knowing more about the new developments at the temple complex can log on to www.mahabodhi.com

Wings Over Armenia

The latest fashion in aerial photography is paragliding. Strap a motor on your back, inflate your wings, and you're off. This has been used to great effect in Armenia, where Professor Hayk Hakobyan, of Yerevan State University appealed for help in carrying out aerial photography in Armenia. Rog Palmer who runs the well-known aerial photography consultancy Air Photo Services in Cambridge came to his help. The British Council stepped in and with the help of a small grant they were able to purchase their own paraglider, pack it into the back of a van and take it out to Armenia. Thus Wings Over Armenia was born, a pioneering project that aims to document Armenia's archaeology from the air using a paramotor (see picture).

Hair-raising though it appears, the paramotor is the ideal tool for aerial photography since the pilot can take off on foot from any nearby field, and fly slowly over a site of interest. Pictures can be taken from altitudes of anywhere between 100ft to 5000ft, depending on requirements and local air traffic laws; in Armenia, its use even got around the current ban on civil light aviation. The paramotor is also easily transported to isolated areas since it fits in the back of a van. Moreover, despite its tiny size, it can take two people – typically a pilot and a photographer.

The Project aims to teach its members how to recognise sites from the air (Armenian archaeology had previously been confined to digging), how to take air photos, as well as concepts of survey and landscape archaeology.

In the first stage of the project, Wings Over Armenia has been undertaking a systematic aerial photographic survey of the Kasach gorge area, 400 sq km of foothills and plains 20 km northwest of Yerevan. This area includes sites dating back to the Bronze Age, along with archaeological

features such as field and road systems that are often best recorded from the air. Since most of the known sites in the Kasach gorge area consist of above-ground structures, it is thought that the aerial photos should reveal sites not yet recognised by Armenian archaeologists. This will provide a much more comprehensive picture of the archaeological landscape, and will allow archaeologists to get a better idea of land-use and settlement patterns, or even about how past societies might have changed and developed

For further information, please see www.archaeology.am





In the 1960s and 70s two complete insulae of the Roman city were excavated, both in an excellent state of preservation. How should they be conserved? Above we can see the innovative cover building with adjacent to it the second insula, now also fully excavated.

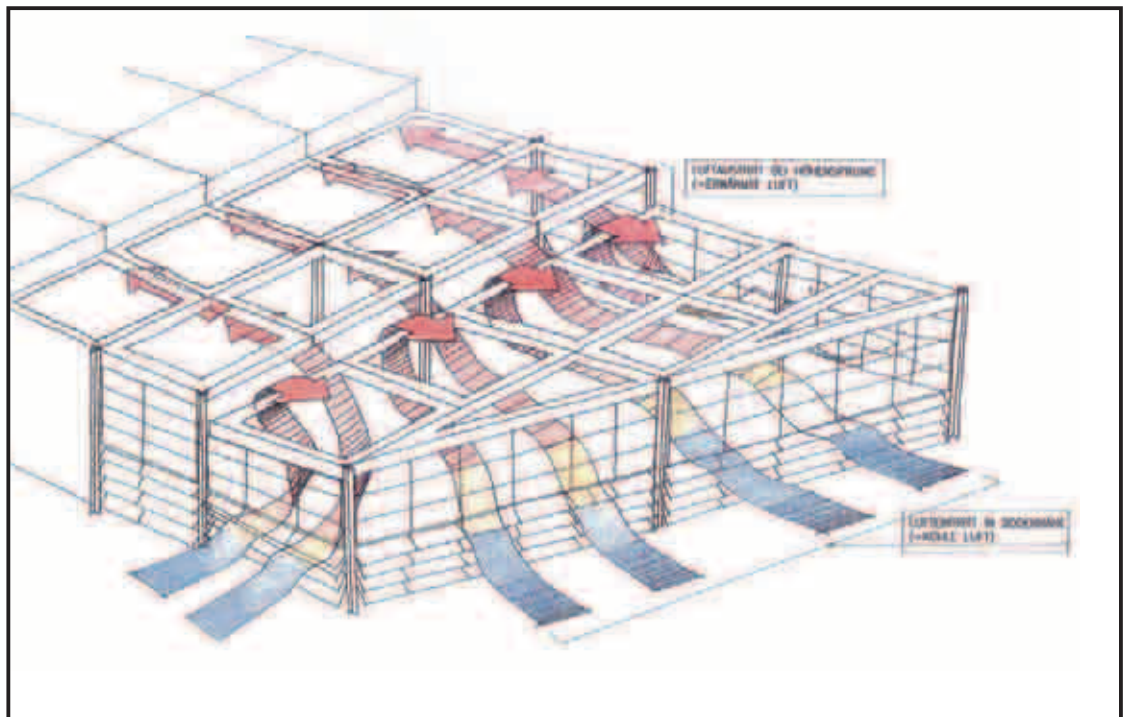
Ephesus

How should an ancient site once excavated be preserved and presented to the public? At Ephesus, an entirely new solution has been put forward.



Ephesus receives 1.5 million visitors a year, some of whom are seen here passing the huge theatre where St Paul once preached.

Right – How the new structure keeps cool. Cold air enters through the louvres at the bottom, rises through the building, and leaves as hot air through the louvres in the roof. Note there is also a cross breeze coming in from the left.





How should an ancient site, once excavated, be preserved and presented to the public? At Ephesus an entirely new solution to this problem has been put forward by erecting a huge new cover building over an entire insula of the Roman town, forming one of the largest and most extensive restoration projects anywhere in the world – and with an ingenious system of temperature control to provide a form of natural air conditioning for the huge space.

Ephesus is one of the most visited archaeological sites in the world with over 1.5 million visitors – nearly twice as many as Stonehenge. It is ideally situated not far from the coast where passengers from the tourist ships calling into nearby Kusadasi can make a quick visit; its position, nestling between hills, means that tourists can be dropped in the upper city and then walk down the marble lined streets to be picked up by their coaches in the lower city, having viewed the huge theatre where St Paul preached one of his more controversial sermons.



Above – The Austrian Institute of Archaeology, which has been excavating at Ephesus for over 100 years, has been very keen on anastylosis – the setting up of fallen columns.

Left – The facade of the Temple of Hadrian, fronting onto the main street, while above is the facade of the Library of Celsus, re-erected in 1973–78.



*The end of a great city.
The bastion in one corner
of the insula (top) was built
to encompass the sawmill.
In the seventh century the
aqueducts were still
functioning and the water
channels (above) were still
running with water.
However, the miserable
inhabitants used this to
power a watermill, driving
a stone cutting saw to saw
up the broken columns.*



**Two of the floor
mosaics found in the
different houses.**

Left is a lady with a fine pair of hips (a Nereid?) reclining on a sea creature (a hippocamp?) being drawn by Triton (off to the right).

However, not all the mosaics were coloured or indeed figurative mosaics. The majority by far were simple black and white mosaics with geometric designs. Black and white mosaics were essentially an Italian fashion and they demonstrate how far, even in the capital of Asia Minor, Italian fashions were prevailing over Greek ones.

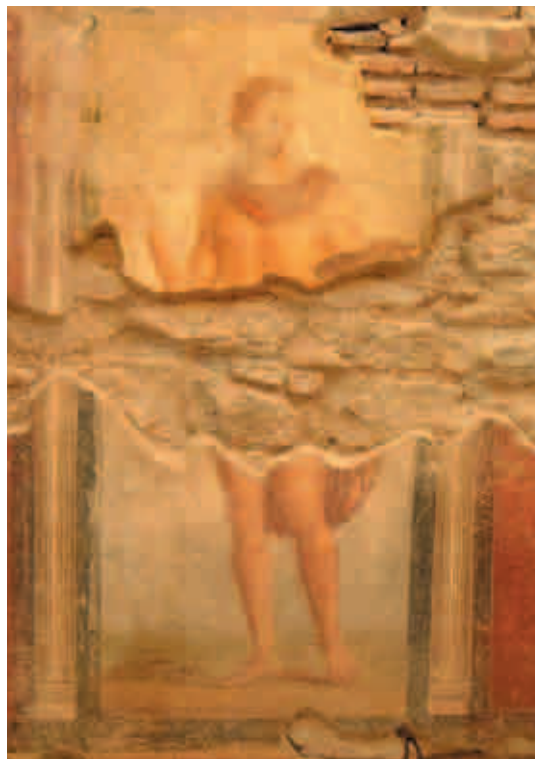


There are in fact three cities at Ephesus. The oldest is that founded by King Croesus in the sixth century BC around the huge temple of Artemis which was to become one of the Seven Wonders of the world. But the ground water was rising and the city and temple were becoming waterlogged, so around 300 BC, Lysimachos founded a new city on the slopes of Mount Coresus a couple of miles away. The Romans made the new city the capital of Asia Minor and it grew to become the fourth largest city of the eastern Roman Empire, after Alexandria, Antioch and Athens. However by the 7th century AD, malaria was threatening, so once again habitation moved to around the church of St John in what was to become the modern city of Seljuk. Thus Ephesus offers the prime example of an essentially Roman city unencumbered by the earlier Greek or later medieval habitation.

Since 1895 Ephesus has been excavated by the Austrians who have made it into one of the most visited sites in the world. This is partly due to its layout and position but also to their policy of anastylosis or the setting up again of pillars which has made it so realistic for visitors. Anastylosis changed from a casual system of re-erection into a positive policy from 1954 onwards and it culminated in the restoration of the Library of Celsus. This has been so successful that it has become one of the most photographed sites in the world and everyone thinks it must have miraculously survived in this shape. In fact like everything else it had been destroyed, but the excavators realised that some 80% of the original façade still survived. So from 1973–78 it was rebuilt, with initial funding from the building firm of Hochtief Essen but mostly by a private individual, Anton Kallinger-Prskawetz.

Meanwhile excavation had been continuing. In particular, private dwellings were investigated, notably two insulae in the centre of the town adjacent to the Library of Celsus. Although they were central in the town, the insulae were built on a very steep hillside so that although they were bounded by roads to the north and south, they were bounded east and west by steep flights of steps from which the individual houses were entered. From 1960–68 Insula I was excavated and then from 1969–86 Insula II was excavated.

It proved to be exceptionally rich. The Insula itself was largely redesigned in the Augustan period, in the early first century AD, over the



Many of the houses were lavishly, perhaps even brashly decorated. The nude above is reclining in a bedroom against a background of red roses.

Left – Two of the wall paintings from what has been called the 'theatre', perhaps simply a private dining room. The scene on the left has been interpreted either as Heracles in combat with the river-god Achelooos, or possibly as Philoctetes.



remains of earlier Hellenistic houses. However, in AD 262, Ephesus was shattered by a huge earthquake. These two insulae were ruined and as a result they were buried almost as effectively as were the houses at Pompeii by the eruption of Vesuvius. There was, indeed, a certain amount of later occupation, but for the most part the houses remain as they were in 262.

When the riches of some of the wall paintings and mosaics were first revealed, they were cut out and taken to the local museum. However it seemed a pity not to leave them in position and thus a policy of roofing over the individual houses was adopted until eventually the whole insula was covered by a series of higgledy piggledy roofs. Was this enough? In 1995 the decision was taken to roof the entire insula with a single roof; Professor Fritz Krinzinger was appointed director of the Austrian Archaeological Institute to make this into a reality.

The first job was to raise money. In Austria as in Germany most such projects are done on a 50:50 principle, so that whatever money is raised from private sources, the government will equal, and there is thus a great incentive to raise money from private sources. The Society of Friends of Ephesus persuaded twelve, mostly Austrian, companies to sponsor the work and eventually over £2 million was raised, which was then matched by the Austrian government.

The whole structure is a triumph of modern lightweight building techniques. The building is supported on a framework of stainless steel girders, the roof is covered by a plastic membrane, not in fact PVC but a derivative known as PTFE ('Sheerfill') which is strengthened with fibreglass and has a Teflon coating. It is extremely lightweight and tough, lets through a high degree of light but only 5% of the heat. The walls of the structure are formed of louvers which allow the air to circulate freely. Indeed the only problem has been that they also allow birds to circulate freely so that bird droppings are the major problem of the building.

The real triumph has been in the temperature control. A computer model of the whole building was made by the University of Graz which has proved highly successful. Ephesus is on a windy site – the wind is blowing for 93% of the time. This means that the cooler air enters through the lower louvers, circulates through the building, rising while doing so and finally leaves as hot air



through the louvers at roof level. As a result of this thermal buoyancy, the building is very effectively air conditioned by wholly natural means.

The insula consists of six houses, three entered from the street on either side, one was later subdivided. Despite the inconveniences of the steep hillside, the houses are so central (and cool?) that they were very attractive, and thus they were occupied by some of the richest inhabitants, who poured money into their homes. The houses are all built in the typical ancient style, centred round a peristyle – an open courtyard surrounded by columns, approached by a narrow entranceway from the street and with rooms leading off.

The largest, and wealthiest was House 6, which an inscription tells us was occupied at the end of the 2nd century by one Caius Furius Aptus, who

Above – The crane lifts the central beam into position, with the library of Celsus in the foreground.

Opposite – The cover building under construction, viewed from the top of the crane.

**The house of Caius
Furius Aptus, the
grandest house on the
block.**

Top – Looking from the peristyle to the arch of the huge private basilica which he constructed, where he and his friends could celebrate to the god Dionysus with the appropriate rituals.

Right – The peristyle of one of the smaller but still magnificent houses that has been almost fully reconstructed.

Below – The view looking down from the top into his peristyle surrounded by columns.





was one of the leading citizens. He was, among other things, a priest of Dionysus, and he was able to indulge this to the full. He purchased part of the adjoining House 4 in order to make a large marbled hall opening off the peristyle. From this an entrance hall led to a huge 'private basilica'. This was dedicated to the cult of Dionysus, and originally had a pool at the centre, later replaced by a hypocaust, and here he and his friends could no doubt indulge in the usual Dionysiac pleasures. At an early stage in the restoration, the arch of this basilica was restored to full height, and as a result dominates the whole restoration: is this perhaps a case where the restoration should be 'unrestored'?

The finest single room is in the top eastern corner – House 1, room 6: this was covered with fine wall paintings of nude figures and has been called the 'Theatre Room' – perhaps it was simply a private dining room.

The other house that is difficult to interpret at first sight is house 7, at the bottom. Here a huge 'bastion' cuts away the western side; this was built in the 6th and 7th centuries when the whole building was a ruin. However the water supply, fed

EPHESUS Time line

560 BC	—	Growth of city under Croesus
c. 300 BC	—	City moved to new site by Lysimachus
133 BC	—	Pergamene empire bequeathed to Rome
29 BC	—	Augustus makes Ephesus capital of Asia Minor
AD 52/5	—	St Paul at Ephesus
AD 262	—	Earthquake shatters town
AD c. 500-650	—	Gradual move to Church of St John on higher ground near modern town of Selçuk

Further Details

Further information on the new building is available in the special publication of the Austrian Institute, *Ein Dach fuer Ephesos*, in three languages.

Tourist info:

Ephesus is one of the most visited archaeological sites in the world: most visitors come from cruise liners calling in at Kusadasi whence they are taken by coach to the site 10 miles away. For the independent traveller Ephesus lies just outside the town of Selçuk where there are a number of hotels. There are, however, rather more hotels in the more touristy Kusadasi.

Source:
Professor Dr. Friedrich Krinzing, Director of the Austrian Archaeological Institute, Franz-Klein-Gasse 1, A-1190, Vienna. Email: fk@oeai.univie.ac.at

Pictures courtesy of the Austrian Archaeological Institute and Andrew Selkirk



Inside the cover building. The new roof was made of a special lightweight material that lets through the light but not the heat.

from the aqueducts, was still functioning and so a whole series of mills was constructed on the eastern side of the Insula, which resulted, at the bottom in House 7, in the construction of a huge bastion jutting out into the former house. This housed what must have been the greatest insult of all to the earlier occupants, that is a saw mill with a stone cutting saw to cut up what remained of the former glories.

The rooms were formally opened in 2000 but the conservation work continues, and therefore only temporary access is possible by wooden walkways. Unfortunately it is not feasible to open the rooms to all the visitors. As Ephesus receives

some 1.5 million visitors a year, a limit of 800 a day has had to be put on the numbers visiting the terraced houses and inevitably an additional charge of £10 per head has had to be imposed. This has hitherto been successful in keeping numbers within limits.

Already the building has been so successful that imitations are proposed, notably at Akrotiri on Thera where the Minoan town destroyed by the volcanic eruption is to be roofed in a similar fashion. The splendid new roof is already a major addition to the tourist attractions of Ephesus and will surely find further imitators in other parts of the world.

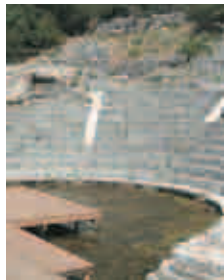
Next Issues

Current World Archaeology No 2 out mid-November

Butrint

Butrint is one of the most stunningly beautiful classical cities, but it is also one of the least known – because it is in Albania. For a generation it was virtually unknown – and undisturbed by tourists from the west: however, because of this, it is also one of the best preserved.

Since the collapse of the communist regime it has become the site of a fascinating struggle; can it be preserved from developers? Butrint is going to become one of the most fabulous cities to visit. Read how it has been preserved, what you can see there and how to visit it.



Sodom and Gomorrah – read all about it...

When God destroyed Sodom and Gomorrah, Lot fled with his wife and daughters. His wife looked back and was turned into a pillar of salt, but what happened to Lot and his daughters? It is all there in the Bible (Genesis 19), but recent excavations – sponsored by the British Museum – have been uncovering 'Lot's monastery' built over the site of the cave where Lot lived and was seduced by his daughters.

Chitral

On the North-West frontier, between Pakistan and Afghanistan, Chitral was for long one of the outposts of the British Empire. Brigadier Bill Woodburn has been investigating a fortress where the British army tried to prop up local chieftains: read what life was really like on the North-West frontier, in the glory days of the British Raj.

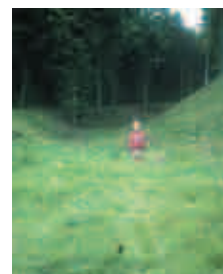
Current Archaeology No 188 out mid-October

Druids in Leicestershire

In rural Leicestershire, the Druids were active at a sacred site. The site was divided into two zones. On one side there was feasting with large scale consumption of beef and pork, and on the other, huge wealth was offered to the gods. No fewer than 15 hoards of Iron Age gold coins have been discovered, together with Roman coins of republican date – well before the conquest of Britain. And perhaps the greatest treasure of all, a Roman helmet was buried, richly decorated with silver inlay. What was a Roman helmet doing there a generation or more before the Roman Conquest?

Roman Danebury

In 1969 Barry Cunliffe began excavating at Danebury, and after twenty years of digging, it became the most extensively excavated Iron Age hillfort in the country. Since then he has been excavating the countryside around Danebury, first the Iron Age settlements and more recently the Roman villas. Barry Cunliffe works fast – he excavates a villa a year – and here he tells us about the four most recent villas.



George Eogan

The huge megalithic tomb of Knowth, in Ireland, is as old as the pyramids, and is one of the great achievements of the megalith religion. For the past forty years George Eogan, Professor of Archaeology at University College, Dublin, has been excavating there: how far has he resolved the mysteries of the megalithic?

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La Milpa

Norman Hammond and Gair Tourtellot

Almost exactly sixty five years ago, on March 30th, 1938, the noted Maya archaeologist J. Eric S. Thompson arrived at a jungle-shrouded ruin in the far northwest of British Honduras, a Crown Colony on the east coast of the Yucatan Peninsula, bordering on Mexico and Guatemala. The site had been reported by a *chiclero* – a chewing-gum collector who tapped the sapodilla trees scattered through the rainforest – and reputedly had at least fourteen carved stelae. These monuments, which we now know were dedicated by Classic Maya kings on important occasions, bear inscriptions in Maya hieroglyphic script recording dynastic history, usually with a date in the Maya Long Count which enables the monument to be correlated with a precise date in our own calendar; most stelae were dedicated between A.D. 300 and 900.

Thompson named the ruin “La Milpa”, “the cornfield”, because the nearest *chiclero* camp a few miles away had a small milpa to supply the men with fresh maize during their months of seeking mature sapodilla trees to bleed for their latex. His field notes include a rapid sketch-plan of what we now call the Great Plaza, or Plaza A, marking the locations of twelve stelae. Thompson recorded glyphs on several of them, but most were eroded: only one monument, Stela 7, had a readable

hieroglyphic date, 9.17.10.0.0 12 Ahau 8 Pax in the Maya Long Count, the equivalent of November 28th, A.D. 780. Several others were similar in style, and it seemed clear that the rulers of La Milpa had flourished during at least the late eighth and early ninth centuries.

He thought that La Milpa was not important enough, either in size or in monuments, to be worth the considerable cost of mounting a proper exploration deep into the forest, and after only two days, during which he had to contend with intestinal problems brought on by the bad water in the local *aguada*, Thompson left. It was his last exploration of an unknown Maya site: for the remaining almost four decades of his life he

Beneath all the trees is Temple 1, the largest of the pyramids of La Milpa, facing out on to the Great Plaza to the right. The site of the Royal Tomb is at the bottom left corner. There are also several large looters' trenches to be seen.

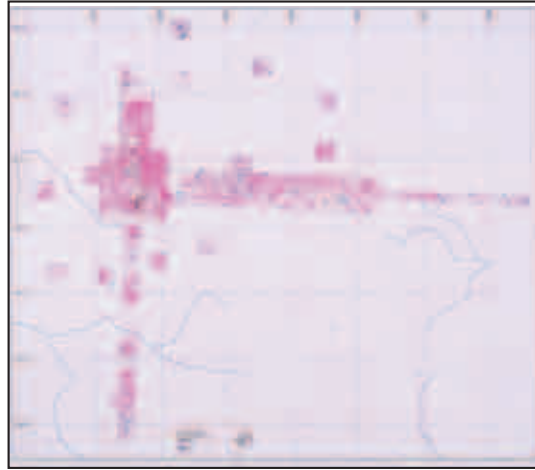


worked on deciphering Maya glyphs, and integrating ethnohistoric and ethnographic knowledge of the historic Maya with what could be elucidated about their prehispanic forebears.

La Milpa remained uninvestigated until the late 1980s, when a new road was pushed through the forest, from the Mennonite settlement of Blue Creek south to the old *chiclero* camp at Gallon Jug, which was being reopened and cleared for agriculture. By this time British Honduras had become Belize, and Belize's Archaeological Commissioner was told of looting in the region, and reports of large-scale marijuana growing. Both turned out to be true. Shortly afterwards, a large area of land was bought by Programme for Belize (PfB), an environmental non-profit group founded by the Massachusetts Audubon Society and by Belizeans concerned about the shrinking rainforest habitat in Central America and the decline in animal and bird species. PfB found that their third of a million acres of forest included this large Maya city (it later turned out that there were dozens of other sites, some not that much smaller: these are being studied by our colleagues from the University of Texas, under Professor Fred Valdez, Jr.): they commissioned a report, and Boston University was brought in.

We proposed to start with a mapping programme using an EDM (electronic distance measuring instrument); first we would investigate the central square kilometre and then we would do two long narrow transects to the east and the south to find out the extent of the city. A series of randomly-positioned Survey Blocks would give us a statistically-robust sample of terrain and settlement pattern against which to match the other evidence. We would also carry out excavations in both core and periphery to build up a community history, and to see how far some of the central buildings could be restored for tourism.

All of this had to be done under one major constraint: La Milpa lay in a biological reserve, and we could not clear-cut forest to uncover buildings or even to create the long lines of sight that our transects needed. Undergrowth such as vines and the myriad other plants – most with sharp spines or other unpleasant protective features – that grew at ground level could be cleared, but for any tree more than six inches in diameter at chest height we had to obtain per-tree permission from PfB's rangers. This also meant that we could not strip soil and debris from the mounds to ascertain their



original form and assess how far they could be restored. However, we had an alternative avenue of approach.

Looters had attacked La Milpa thoroughly in 1979–81, digging large trenches into virtually every large structure in the site core and many in the surrounding settlement in search of tombs: over the past quarter century Maya polychrome vases and carved jades have become fashionable among collectors of Pre-Columbian art and museums (such as Boston's Museum of Fine Arts, which has a substantial collection of such "unprovenanced" objects, including at least one polychrome vessel likely to be from La Milpa), and the high prices fetched – sometimes in the millions of dollars – have underwritten further looting.

We took as one of our basic tactics the cleaning and recording of such looters' trenches, which gave us cross-sections through the architecture of numerous buildings and enabled us to date them.

The research strategy at La Milpa. The whole of the central area including the Great Plaza and the palaces was mapped. Two transects were also mapped, one to the east and one to the south. In addition 15 randomly located settlement blocks were mapped, which demonstrated that the transects themselves are statistically valid cross-sections through the settlement.

Each square has dimensions of 1 km.

A good example of the natural vegetation that covers the whole of La Milpa. This is the view across the Audience Court of the Western Palace. The photographer (Norman Hammond) is standing on one side. Somewhere on the far side is Amanda Clarke (otherwise known as Director of the Silchester excavations) hidden in the vegetation.



Left – Temple 5 lies by the south west corner of the largest pyramid. In the foreground is Stela 7, dated to November 28th AD 780, which is tied by a plaster floor to the coeval construction of the temple.



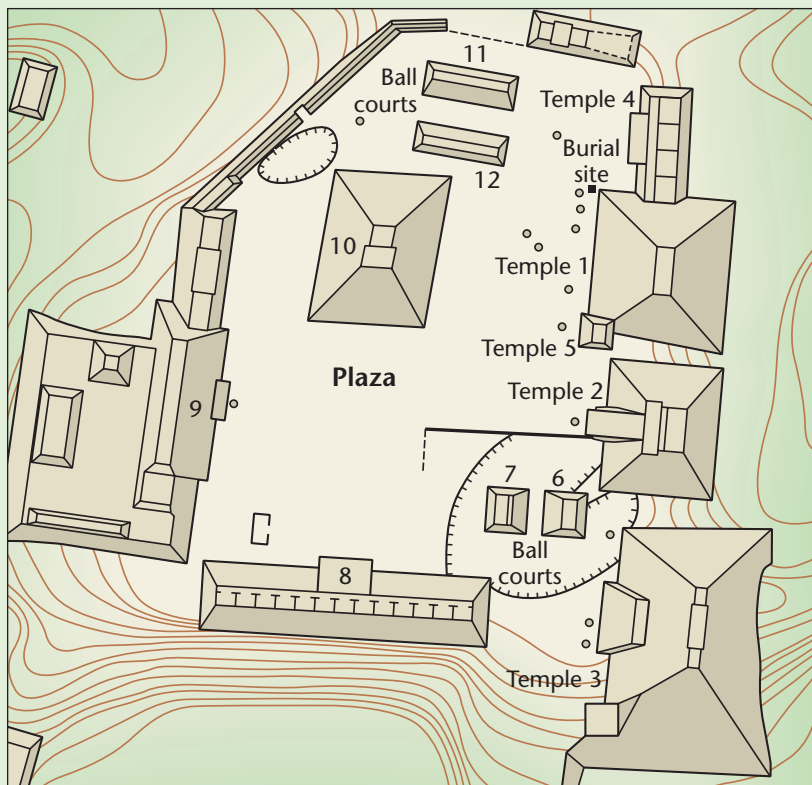
How the Great Plaza was laid out

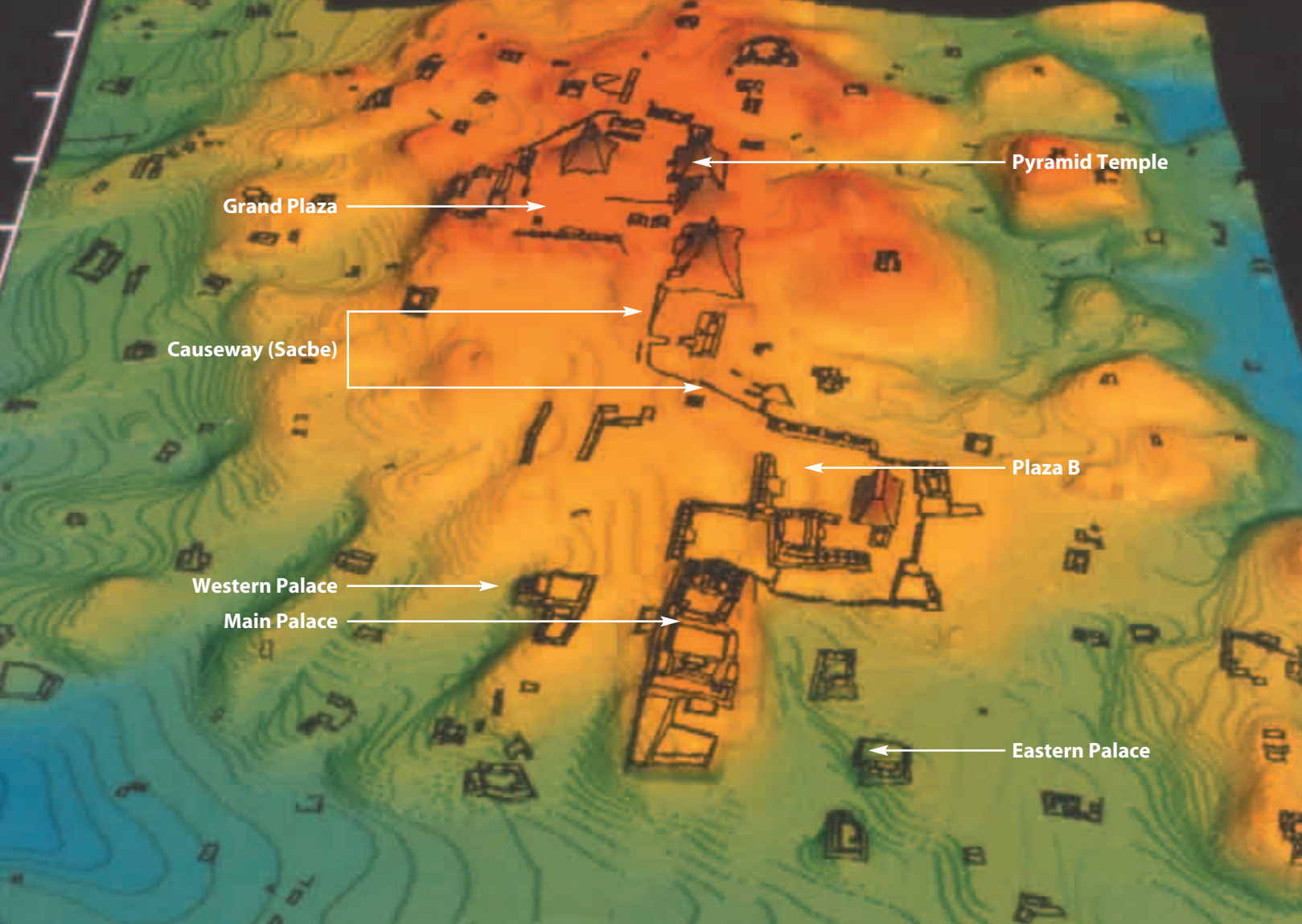
The Great Plaza, at 18,000 square metres, is one of the largest known in the Maya world. There were four huge pyramids (which in the Maya civilisation were used both to cover royal tombs and also elevated temple platforms). Three, numbered 1 to 3 lay on the eastern side of the Plaza. The main pyramid may have

been Temple 1, since in later centuries many stelae were repositioned in front of it in an act of retrospective veneration. At one corner, is the small Temple 5, which like Temple 1 incorporates an earlier building; the multiple phases of Temple 1 suggest that it may be the initial ceremonial structure on the site.

Adjacent to it was Temple 2, and beyond that lay the third pyramid (Temple 3) somewhat outside the main plaza. However the fourth main pyramid, Temple 10, lay in the centre of the plaza.

Around the Great Plaza were a number of other buildings, and the function of at least some of them can be guessed by pairing them with the pyramids, for the pyramids often appeared to be aligned with significant other buildings. Thus Temple 10, at the centre of the Plaza, is on the same axis as Structure 8, the long range structure that closes off the plaza's southern margin. Structure 8 is still unexcavated, but it appears from its surface configuration to have had 13 rooms. Thirteen was an auspicious number to the Maya, representing the *oxlahuntiku* or gods of the heavens, so Structure 8 may have had more than just a residential or administrative function. The two buildings may well form a "palace-temple" pair on a north-south alignment. There may have been a similar relationship on an east-west alignment between Structures 2 and 9. The axes linking these pairs cross just where a rock-cut *chultun* chamber, a potential entry to the Maya underworld, lies in the middle of the open space. Within the Great Plaza there are two other pairs of major ceremonial buildings, the ball courts, Structures 11 and 12 to the north, and 6 and 7 to the south.





The Ceremonial Centre

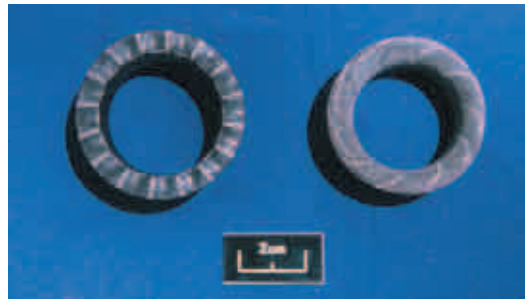
What did a Maya city really look like? At the heart of every great Maya city is the 'ceremonial centre' with a central plaza surrounded by the huge steep pyramids. At La Milpa the Great Plaza is set on a hill-top and was huge – large enough to hold two football matches, and surrounded by four huge pyramids, emerging from the jungle. By following the looters' trenches, we were able to carry out two major excavations at two corners of the largest of them, Pyramid 1. At the southern corner a complete temple was excavated which had been covered by the deposits eroded from the pyramid after it had been abandoned. It is fronted by Stela 7 which is the only dated stela, dating to November 28th, AD 780. The stela is set into a plaster floor which runs under Temple 5 so that it provides the date before which the temple was constructed.

The excitement came however, near the north-west corner of the pyramid where an untouched royal tomb was discovered. We stumbled upon this by accident when we were looking for the

(non-existent) setting for the recumbent Stela 1, late in the 1993 season. We hit a deposit with alternating layers of limestone slabs and chert flakes: such deposits were commonly used in the ceremonial closing of the shafts of noble or royal tombs. With no time to investigate, we refilled the excavation and reopened it in 1996.

The deposit, including nearly 17,000 chert flakes, did indeed fill a shaft cut down into bedrock, where a rough stone corbel vault within the small chamber protected a single burial. Julie and Frank Saul identified him as a man of 35–50, who had lost all his teeth long before death, and who had a permanent neck injury that could have been caused in battle, or by playing the ball game. His grave goods were odd and few, given the elaboration of his tomb. There was only one 'royal' object: across the chest of the corpse had been laid a splendid collar of carved and colour-matched jade beads, with a pendant in the form of a vulture head. The Maya used such a head in their hieroglyphic script as a synonym for *ahaw*, 'lord, ruler': this surely indicates that he was in fact, a king.

The site core of La Milpa presented as a digital terrain model by Francisco Estrada-Belli. The Great Plaza is at the top on the highest plateau with a row of pyramids on its right hand side, and a fourth pyramid in the centre. At the bottom is the palace acropolis with the two residential palaces on either side. The coloured contouring brings out well that the centre is set on top of the highest plateau in the area. Note how all the lesser hillocks are crowned by a building, the residences probably of elite families.



However he was not given a normal royal burial. The closed-up shaft had not been marked with any mound or monument – which is why it had escaped the looters. The grave assemblage is poor, suggesting a hurried burial, although observing the rites appropriate to a man of pedigree. The date too is a problem: an AMS (small sample radiocarbon) date on collagen from the skeleton suggests death as early as A.D. 220–350, but the style of the pottery vessels is at least a century later. The unmarked grave would accord better with an even later date, in the later fifth century. This was a time when La Milpa was in temporary decline: could it be that that the burial was indeed of a king, but one who had come to a sticky end, and was thus given this hurried and unmarked burial?

The palace

The royal palace was part of the ceremonial centre, but lay some distance to the south of the Great Plaza, connected to it by a raised causeway, known as a *sacbe*. The palace was a complex of courtyards raised above a smaller plaza which we named Plaza C. A robbers' trench had gone through the centre of the throne room, and we were able to recognise part of the throne, with its elaborate polychrome frontage.

More exciting, perhaps, were two smaller palaces, one to the east, one to the west, which may have been the places where the ruler actually lived. Both appeared to have the essential characteristics of a palace, an audience courtyard and a throne room, with an adjacent domestic area. In the western palace the throne was a substantial structure, three metres wide and two metres deep, large enough to accommodate the whole royal family, as indeed some the well known Bonampak murals suggest. It was, however, a deceptively economical construction: instead of being made from slabs of stone, it was built of rubble, plastered over and then painted. In the Western Palace the front was painted in a deep red, but in the East Palace as well as the main palace the front had a polychrome decoration with imitation legs painted in low relief.

LA MILPA Time line

2000 BC to AD 250	the Pre-Classic (1000–400 BC: the Middle Pre-Classic, Olmec reaches apogee)
400 BC – AD 250	Earliest evidence at La Milpa
AD 350 – 500	The early flourishing at La Milpa: first dated stela.
AD 750 – 850	La Milpa reaches its greatest extent: stela dated to November 30th 780.
c. AD 850 – 900	Collapse and abandonment of La Milpa
c 900 – 1200	Toltecs
c. 1200 – 1521	Aztecs
1521	Spanish Conquest

Above – The royal burial. Note the jade necklace just below the skull, and three of the five pottery vessels. At the centre is the pink thorny oyster shell, found only in high status burials.

Inset – The jade necklace found in the royal tomb worn by one of the Maya workmen, Andres. The 23 beads are carved and colour matched and hanging at the bottom is the vulture head pendant, symbol of royalty, in a slightly deeper shade of green jade.

Top, right – Two obsidian ear ornaments found in the royal burial. They are remarkably fine artifacts but note they are unmatched, suggesting that the royal burial was made in haste.

Cosmology

One of the most remarkable discoveries at La Milpa was that we were able to work out something of the cosmological layout of the whole site. Gair Tourtellot directed a meticulous survey of the site periphery. The expedition surveyed two long transects, each 200m wide, one stretching 6 km to the east to beyond the limits of the settlement, and a shorter transect running 4 km to the south (see map overleaf). A notable discovery was in the east transect, where another plaza was discovered, called La Milpa East. Here the hilltop had been flattened to form a plaza large enough to have held 5,000 people. It is the third largest on the whole site, bigger indeed than Plaza C at the base of the palace acropolis. On three sides there were long narrow multi-room structures, while on the fourth there was a small pyramid. There was also a stela – the only one to be found outside the ceremonial precinct. Accurate survey and viewshed analysis revealed that if the jungle had been cleared away, the pyramid and stela would have been due east of and inter-visible with Temple 1 on the Great Plaza. Was this significant?

Mapping of the south transect had by this time already extended out 3.5 kilometres from the centre, where to our surprise and delight a similar “minor centre” was discovered, again on a hilltop, again inter-visible with Temple 1. The axes from Temple 1 on the Great Plaza to La Milpa East and La Milpa South are precisely 90 degrees apart, and almost exactly oriented to the true (rather than the magnetic) cardinal points. Were there similar centres waiting to be discovered to the north and west and if so, did they form a cardinally aligned cosmogram?

The following season (in 2000) we returned, this time equipped with GPS systems, so that we could navigate by satellite in the rainforest. Searching due west along logging roads, at 3.5 kilometres out, atop a hill we found what we were looking for, another minor centre on a hilltop within a few metres of the predicted location. The marvellous confirming feature was the seven metres tall pyramid on the west side of the plaza: it faced directly east to La Milpa Centre, and mirrored the pattern of La Milpa East.

Would there be a similar site at La Milpa North? It took only two days of searching to find what we were looking for, again close to the



Top – View from the audience courts of the East Palace to the inner throne room, where the polychrome fronting to the throne is highlighted by the sun.

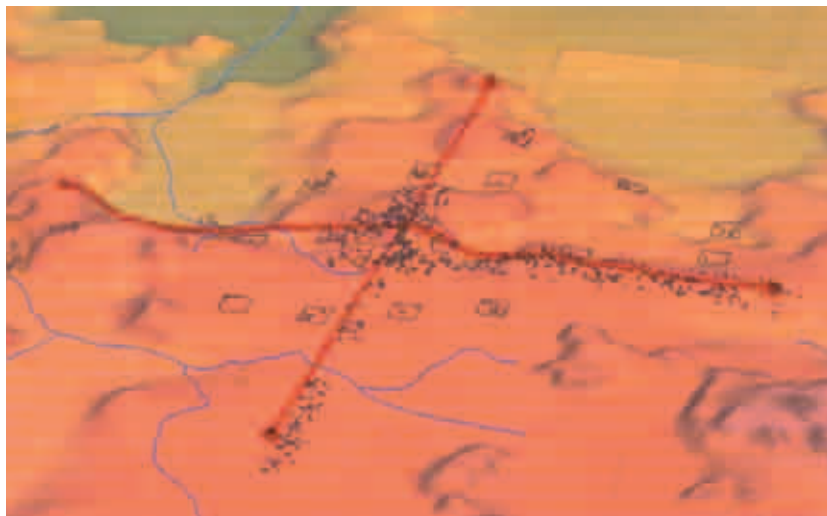
Above – Watercolour painting by Candida Lonsdale of the frontal to the throne. Note that the false legs are modelled in relief and highlighted in blue. The trefoil ornaments are of specular haematite which glistens in the light.

Left – Norman Hammond sitting on the throne in the Western Palace. Note that it would have been big enough to accommodate most of the royal family.

predicted location. This time however, it was rather different. There was no temple, no plaza, but instead a line of hilltop courtyards, the signature of a Maya palace with residential as well as ritual functions.

Is there some grand cosmological function here, with a cruciform cosmogram? The East and the West Plaza mirror each other: the sun rises in the east, then passes over the site core at zenith before descending though La Milpa West to the hidden underworld and through it to rise again in the east next day. This vertical-circle model was flipped on its side by the Maya, who used the north as a proxy for the zenith, and south for the underworld. In La Milpa’s four cardinal, equidistant and inter-visible minor centres, Maya cosmology is revealed.

Source and photos:
Norman Hammond is Professor of Archaeology, and Gair Tourtellot is a Research Fellow in the Department of Archaeology, Boston University, USA.
Email: ndch@bu.edu



The cosmological layout of La Milpa. This digital terrain model shows the cruciform cosmogram with the main palaces and plazas at the centre and minor centres to the east, south, west and north in the cardinal directions equidistant from the centre.

Where did the people actually live?

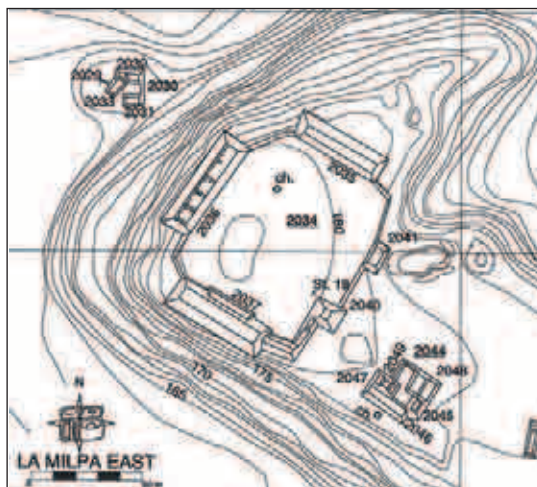
Spectacular though the central area may have been, it was also the centre of a huge sprawling town, which spread over 78 square kilometres, and may have contained up to 50,000 inhabitants at its height. Maya cities were quite unlike Near Eastern or Mediterranean towns. It was a “garden city”:

instead of the houses being densely packed together, they are spread out in little farmsteads scattered over the countryside, each surrounded by its gardens and orchards. Mostly they survive only as house platforms, but some are arranged round a courtyard, sometimes even a double courtyard. They are surrounded by terraces, stony berms, and piles of rocks that make up the gardens, with property walls dividing one family from another. Mostly they were low-lying, on land that was more easily cultivated. On the hillocks were more substantial structures which were presumably the dwellings of the local élite, centres for management and control.

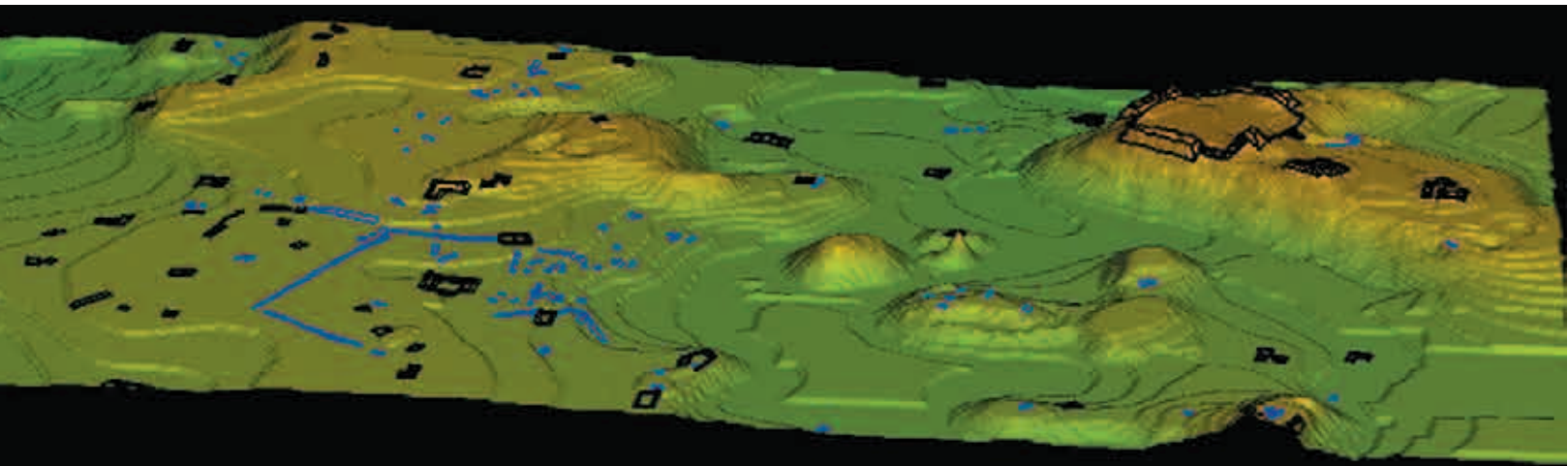
Dating

What was the date of La Milpa? Perhaps surprisingly, it appears that the great city itself was comparatively short-lived, lasting only a couple of centuries, from around A.D. 700 to its sudden collapse round A.D. 840. However the central core was much earlier. It proved to have been first settled around 400–300 B.C., as a hilltop settlement on the high ridgetop that underlies the Great Plaza: a dense layer of trash from this Late Preclassic period was found at the base of almost all our probes, diminishing when we moved outside this area to scattered sherds. The first La Milpa seems to have been a small village, one of several in the vicinity judging by the occurrence of Late Preclassic trash identified by Kerry Sagebiel at several locations in the settlement zone.

However, in the Early Classic period (A.D. 250 to 600) the first ceremonial buildings began to appear on the eastern side of the Great Plaza, low



La Milpa East: plan (right) and digital terrain model (below). In the model below the centre is marked in black at the top right. Note its position on the most prominent hilltop, intervisible with the main centre, 3.5 kms to the west.



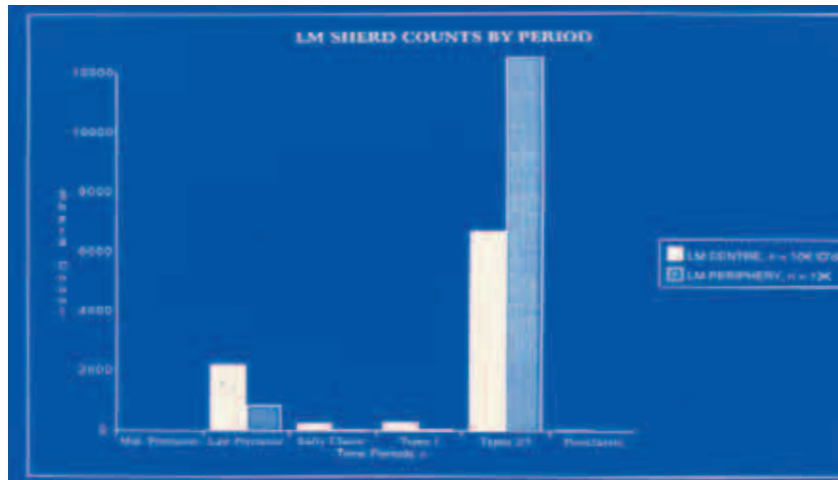
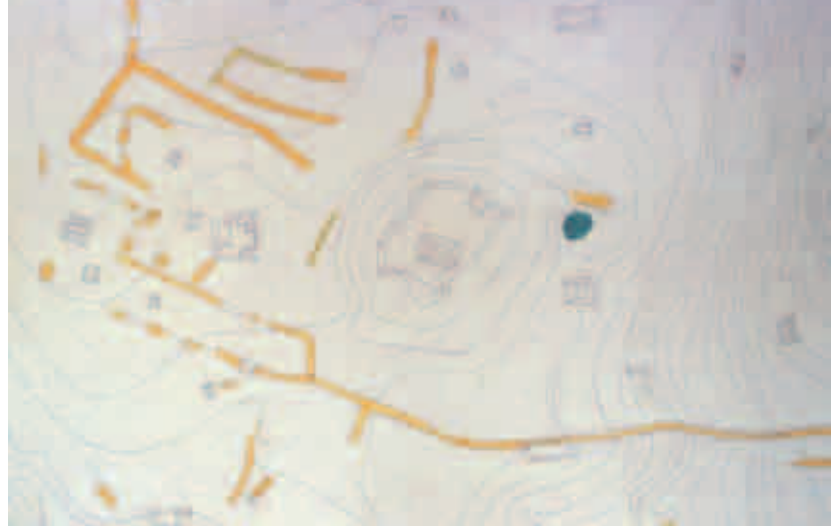
platforms of cut soft limestone blocks covered with plaster. Temple 5, which is the small building at the corner of the great Pyramid, Temple 1, was one of these, with a line of cache vessels dedicated in front of it and buried by a new plaza floor. An equally early building probably underlay the northern end of the huge Structure 3 pyramid.

The carved stelae also appear to have fallen into two groups – early and late – and several were dedicated to the rulers of this Early Classic period, though apart from Stela 10, none remained complete and in situ. While only the later Stela 7 has a legible text, our epigrapher, Dr. Nikolai Grube (University of Bonn), considers Stelae 1 and 16 to date between A.D. 317 and 514 (8.14.0.0.0 and 9.4.0.0.0 in the Maya Long Count), and Stela 15 probably lies within this span.

But what happened between the Early Classic period (A.D. 250–600) and the middle of the Late Classic period (A.D. 700–840)? Very little pottery of the sixth and seventh centuries has been found at La Milpa, suggesting that it may have been almost completely abandoned at this time: was this linked with the long-lasting struggle between Tikal and Calakmul, which ran from the middle of the sixth to the end of the seventh century? The very strange ‘royal’ tomb, described above, may belong to this period. Tikal’s victory in A.D. 695 was followed by a rapid resurgence, something we see also at La Milpa.

The eighth and early ninth centuries were La Milpa’s time of greatest prosperity: the overwhelming majority of the pottery collections and the buildings from which they come, date to this period, when the population may have risen as high as 50,000. In the Great Plaza we see this revival in many ways: new monuments were dedicated, including Stelae 7, 8, 11 and 12, all still in position along the east side of the plaza. Stela 12 is the southernmost, and earliest in style, although no date is preserved. The only readable glyph is, by good luck, the Emblem Glyph which denotes the La Milpa polity. Stela 7 remains the only fully legible text: the ruler Ukay dedicated it in November of A.D. 780 at the time of the new moon.

But some time between A.D. 830 and 850, La Milpa ‘collapsed’. The northwestern and northern sides of the Great Plaza had no buildings, merely long, low mounds which look unfinished, as though more was intended to happen. The fifth large pyramid, Structure 21 on the large southern



Plaza B, lacks masonry facing, a stair, and a superstructure. A major extension of the main palace was left unfinished. Between the Great Plaza and Plaza B was a quarry with freshly-made blocks stockpiled ready for use. Similar evidence of sudden abandonment was found in the outlying minor centres. La Milpa went out with a bang, but a silent one: we have no evidence for invasion, destruction or any other explanation for why, in the middle of a major royal building program that embraced the palace, a temple, several other major structures in the core, and an ambitious overarching cosmic landscape design, it all fell apart.

Further Details

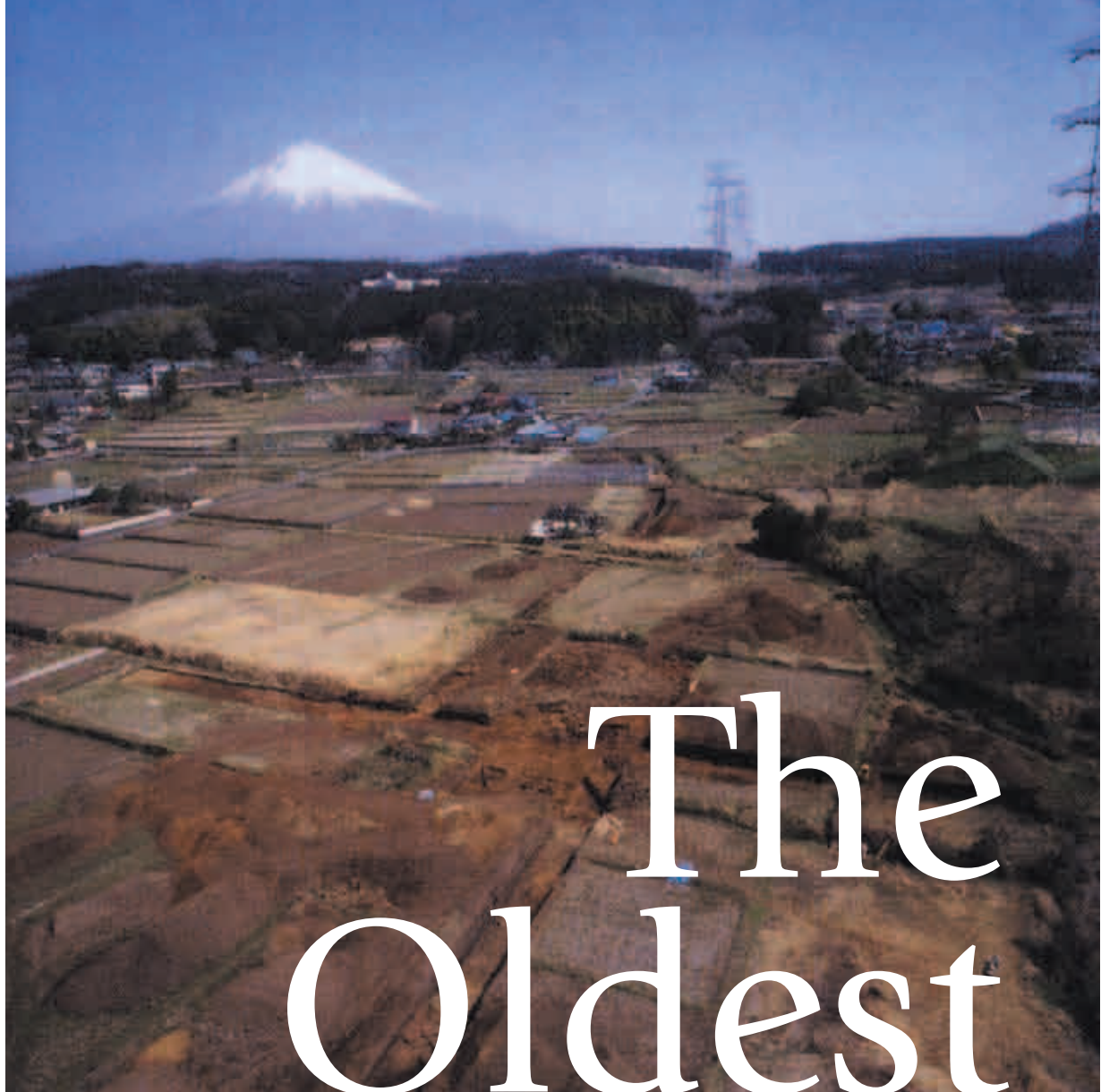
Further information on La Milpa can be found on the web site of Boston University, USA, www.bu.edu/lamilpa/ which includes a map of the entire project, the first Maya site map to be published in full on the web.

Tourist info:

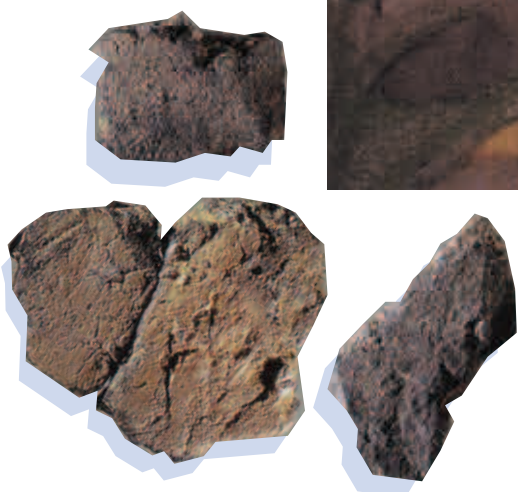
La Milpa is rather off the tourist track, though visitors can stay at the La Milpa Research Station. Applications should be directed to the Programme for Belize at www.pfbelize.org

Top – A typical farm/gardening property in the east transect. The blue blob at the centre, east of the main building, is the water hole. The yellow lines mark the landscape engineering, partly property boundaries, and partly box terraces laid out for intensive cultivation.

Above – The population of La Milpa as indicated by sherd counts. The small but significant late Pre classic (300 B.C.–A.D. 250) community declines in the Early Classic period (A.D. 250–600), but then suddenly shoots up in Late Classic II from A.D. 800 onwards, followed by a sudden and total collapse.



The Oldest



Pottery in the World

*By Simon Kaner
of the Sainsbury
Institute for the
Study of Japanese
Arts and Cultures*

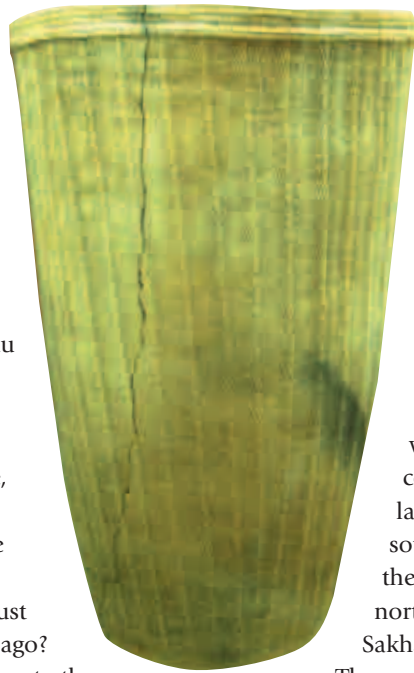
Where is the oldest pottery in the world? Perhaps surprisingly, the answer is, Japan. The discovery that Japanese pottery goes back a long way is not, in fact, new. In the 1960s, excavations in the Fukui cave in the southwestern island of Kyushu produced what appeared to be remarkably early pottery. When some of the earliest radiocarbon dates were obtained from the site, they came out at around 12,000 uncalibrated years ago. Ever since then, one of the big questions of Japanese archaeology has been: just how old is pottery in the archipelago?

The pottery concerned is known to the Japanese as 'Jomon pottery'. The word 'Jomon' means cord-marked, and the Jomon period takes its name from this type of pottery. Jomon pottery was first recognised by the American zoologist Edward S. Morse, who in 1877 undertook what is widely recognised as the

first scientific excavation in Japan, at the shell mounds of Omori, a short distance west of Tokyo in the modern city of Yokohama. Morse considered that the pottery he had discovered was no more than a few thousand years old. In the 125 years since Morse's investigations, many tens of thousands of sites dated to the Jomon period have been investigated, and it is

now widely accepted that pottery was indeed being made in the archipelago from before 10,000 years ago. Over 70 major regional styles and in excess of 400 minor styles have been identified and the Jomon period is now divided into six subperiods (Incipient, Initial, Early, Middle, Late and Final), running from the Palaeolithic down to the appearance of rice agriculture towards the end of the 1st millennium B.C.

The earliest appearance of this pottery is usually associated with the major environmental



changes at with the end of the Pleistocene and the start of the Holocene. (Or, in British terms, with the end of the Palaeolithic and the beginning of the Mesolithic.) The last glacial maximum (c. 18,000 years ago) saw sea levels up to 100m lower than today, and the present-day Japanese archipelago was connected to the East Asian continental mainland by landbridges, joining the southwestern island of Kyushu with the Korean Peninsula and the northern island of Hokkaido with Sakhalin and on to the Siberian coast.

The area of the Japanese archipelago was not covered by ice sheets, and Late Paleolithic hunters were active before 30,000 years ago: it is normally considered that they led mobile lifestyles, hunting the large Pleistocene fauna including Naumann's elephant and giant deer.

Every year, for the past decade or so, the Agency for Cultural Affairs, which has responsibility for archaeology throughout the Japanese archipelago, has organised an exhibition of the most important discoveries made during the previous year. This year, the exhibition will be shown in seven locations throughout Japan, finishing in February 2004. According to the Agency for Cultural Affairs there are more than 440,000 known archaeological sites in the Japanese archipelago, and the past year saw nearly 10,000 being investigated. These annual exhibitions generate considerable interest: that in 2002 was visited by more than 74,000 people. One of the sites featured this year is Oushikakubo, where a series of built structures were excavated, associated with pottery dating to before 10,000 years ago.

required for hunting large mammals, once they were replaced by smaller animals, the first arrowheads appear, presumably implying the development of archery. The new forests provided a different range of foodstuffs, in particular plants and fish. Pottery provides useful containers in which to boil vegetal foods and make them edible.

Perhaps the best newly discovered example of a Jomon settlement right at the beginning of this new warm era is the site recently excavated at Oushikakubo. Oushikakubo is located on the

Opposite page – View across the Oushikakubo site from the southwest, with Mount Fuji in the background. (Courtesy of Shibakawa Town Board of Education, Shizuoka Prefecture)

Left – A typical cord-marked Jomon pot.



Oushikakubo: many of the dwellings were pit houses, cut down into the subsoil. Note that the larger one cuts down through two earlier ones, suggesting either that the site was occupied for a considerable time, or that it was repeatedly re-occupied.

western slopes of the Habuna range of hills in Shizuoka Prefecture, located to the southwest of Mount Fuji, one of the most evocative landmarks of the contemporary Japanese landscape. In line with the laws for the protection of cultural properties in operation in Japan, the site was excavated prior to the development of agricultural land by the local Board of Education. The excavations produced in excess of 20,000 worked stone objects, including tools such as points, endscrapers and flakes. There were also pottery sherds. These were variously decorated with thin appliqué bands of clay (so-called linear-relief pottery), short curved incised patterns reminiscent of finger-nails (the finger-nail pattern pottery) and pottery bearing the impressions of twisted cords (known as Jomon pottery in Japan).

The site was an extensive one – more a village than a single house. At least ten round pit buildings whose floors had been dug into the ground, were discovered with sherds of cord-

impressed pottery. Around the outside of each pit, associated post-holes were found, which would have held posts supporting the roof. There was also evidence for the processing of plant foods – perhaps nuts. Within each structure was found a flat stone and a grinding stone, and some houses contained traces of burnt earth hearths. A short distance to the east of these buildings were examples of two other categories of feature, stone clusters and stone arrangements. However, it is difficult to be sure how many of the buildings were in use at any one time. Oushikakubo may have been a 'village', and suggests a higher degree of residential stability than previously thought for the Incipient Jomon.

Back into the Pleistocene?

But was there any pottery earlier than this, going back right into the Ice Age? In July 1998, a team led by Taniguchi Yasuhiro of Kokugakuin

University in Tokyo, was invited by the Kanita Town Board of Education (in Aomori Prefecture, on the northern tip of the largest island in the Japanese archipelago, Honshu) to conduct excavations prior to the construction of some houses at a site called Odai Yamamoto. Here Late Palaeolithic stone tools had previously been discovered, belonging to an assemblage recognised as part of the so-called Chojakubo culture. Hitherto the Chojakubo culture had been dated by its stratigraphic relationship to a volcanic tephra, the Hachinohe Tephra, which has been dated by radiocarbon to 12,500–13,000 years ago. The Chujakubo assemblages predate this tephra.

Taniguchi and his team excavated 148 m² in total. Artefacts were recovered from two strata. Stratum III was a yellowish tan volcanic ash loam, and Stratum IV was a light yellowish brown sandy-silty loam. 262 stone artefacts and 46 pottery sherds were discovered in an area about 10 metres in diameter, described in the report as "a very clear, single point-in-time assemblage".

The 46 sherds of pottery from Odai Yamamoto all come from the same pottery vessel. Analysis of the clay demonstrated the presence of local rock materials, including quartz, biotite and felsitic white groundmass, evidence that the vessel was made from locally available clay. Although it was not possible to completely reconstruct the vessel, it was clear that it had a flat base and a straight rim. The walls of the vessel were 7.6 mm thick. Apart from some narrow engraved lines on nine of the sherds, the outer surface of the vessel does not appear to have been decorated. 30 of the 46 sherds had carbonized accretions, some of which formed a water-line along the inner surface of the vessel, suggesting that the vessel had been used to boil up foodstuffs.

These pottery fragments were found in association with the a lithic assemblage comprising 1 core, 65 blades and blade flakes, 2 anvils, 2 axes, 2 arrowheads, 1 spear point, 1 side-scraper, 11 end-scrapers, 4 graters, and 11 combined graters/endscrapers/sidescrapers. Over 90% of these stone tools were made of locally available hard shale and a further 5% were made of obsidian which originated in a source some 70 kilometres away from the site. Of particular interest in this assemblage are two arrowheads made of hard shale, just under 3 cms long, and not quite 2 cms wide and with rounded convex bases. Previously, it has been thought that arrows and



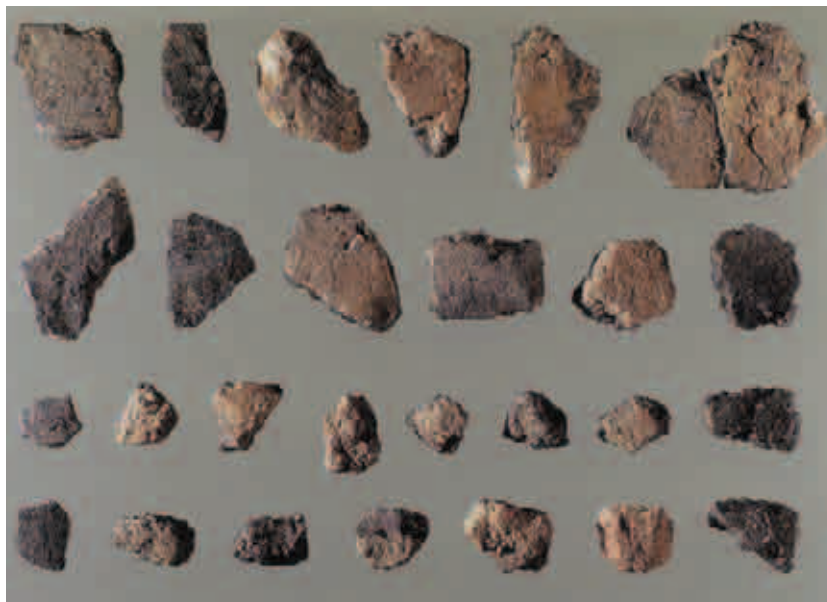
JOMON Time line

19,000 to 16,000	The last Glacial Maximum hits its peak
c. 12,000 – 10,000 BC	Incipient Jomon Period
c. 9,600 BC	Start of the Holocene (our current warm period)
c. 5,000 – 4,000 BC	End of the Holocene marine transgression (the 'Jomon marine transgression') in Japan – sea reaches its most landward position.
c. 300 BC	Use of Jomon pottery dies out.

their associated technology of archery came into usage around 11,000 years ago, but these examples from Odai Yamamoto suggest that archery, along with pottery, was being practised long before that.

But just how old was the site? A recent survey of radiocarbon dates from the Late Pleistocene from the Japanese archipelago in *Radiocarbon* (Ono *et al*, 2002) suggests that there are some 4500 Pleistocene sites in Japan, and that about 100 new sites are being investigated each year. The same survey lists 429 radiocarbon dates from about 100 of these sites. Ono Akira from Tokyo Metropolitan University and his colleagues, who produced this useful survey, concluded that the

Source:
Simon Kaner,
Sainsbury Institute
for the Study of
Japanese Arts and
Cultures, University
of East Anglia,
Norwich. Email:
s.kaner@uea.ac.uk



Top – Pottery sherds from Odai Yamamoto, outer surface. The sherds may all have come from a single pot.
Above – Pottery sherds from Odai Yamamoto, inner surface

Japanese Upper Palaeolithic should be divided into three stages: an early Upper Palaeolithic (from before 34,000–26,000 years ago), a late Upper Palaeolithic (from c. 25,000 years ago to 15,000 years ago) and a Final Upper Palaeolithic and Incipient Jomon period (from c.14,000–12,000 years ago).

Some of the sites they mention, however, suggest that there was more to Upper Palaeolithic life than chasing after large mammals. At Hatsunegahara, also in Shizuoka Prefecture, 56 pit traps, up to 1.5m deep, have been discovered sealed beneath one of the most important of all the Japanese Pleistocene volcanic tephtras, the AT horizon, which resulted from the massive eruption of the Aira Caldera, whose remains can be seen around Kagoshima Bay and present day Sakurajima in southwestern Kyushu. This tephra is

well-dated by AMS dating to 23–22,000 years ago. The finds from Hatsunegahara suggest that medium-sized animals were being hunted in an organised planned fashion prior to 25,000 years ago. At the remarkable waterlogged Palaeolithic forest floor at Tomizawa in Miyagi Prefecture, the droppings of sika deer (*Cervus nippon*) were discovered – direct evidence for the presence of medium sized mammals in the area during the last glacial maximum.

All of the dates provided in this survey, however, are uncalibrated. Because of fluctuations in the radiocarbon reservoir, all radiocarbon dates need to be calibrated: the calibration of dates back into the Neolithic is now well-established, but the calibration of Palaeolithic dates is relatively new, it appears that radiocarbon dates around this period need to be pushed back by about 2,000 years. It is the effects of calibration that are causing such interest in the finds from Odai Yamamoto. A total of 8 AMS dates were obtained from the carbonised adhesions on five of the pottery sherds and three pieces of charred wood found in association with the pot sherds. These gave a range of some 13,500–13,800 uncalibrated radiocarbon years ago, currently the earliest dates for pottery in East Asia, and indeed anywhere else. The dates were produced by Nakamura Toshio of the Nagoya University Dating and Materials Research Center and Tsuji Sei-ichiro of the National Museum of Japanese History. The only AMS dating facility in Japan is located at Nagoya University, and this is where the carbonised accretions were dated. The three wood samples were dated by the Beta Laboratory in the USA. Nakamura proceeded to calibrate his dates using the MacCALIB 3.0 program, and this pushed the dates back to 16,000–16,500 calibrated radiocarbon years ago (i.e. around 14,400 to 14,400 B.C.).

This is of great significance as it places the earliest known pottery in East Asia before the beginning of the first warm stages at the end of the Pleistocene, the Bølling interstadial (dated to 14,760 calibrated radiocarbon years ago) and the subsequent fluctuations of the Younger Dryas (dated to 12,890 calibrated years ago). This is before any of the Holocene environmental conditions appeared in what is now the Japanese archipelago and places early pottery usage firmly in the Late Palaeolithic. The results of more dates from this critical period are eagerly awaited.

The discoveries of early pottery and arrowheads at Odai Yamamoto, in conjunction with the evidence for the well-organised use of the landscape during the Late Palaeolithic and suggestions of a relatively settled lifestyle during the Incipient Jomon period at sites such as Oushikakubo, suggest that we need to reassess our view of what life was like at the Pleistocene-Holocene transition. Advances in dating techniques offer the possibility to understand these critical developments at a much finer scale of resolution. The May 2003 issue of the journal *Kikan Kokogaku* (*Archaeology Quarterly*) was devoted to the theme of researching the origins of Jomon culture that emphasises the regional diversity at this time, even within the seemingly relatively narrow confines of what was to become the Japanese archipelago. A conference in Cambridge in autumn 2001, to be published in the *Journal of East Asian Archaeology* in 2004, summarised findings of early pottery elsewhere in East Asia. Particular attention was given to the Amur River valley in eastern Siberia and China, where increasing numbers of sites with pottery dated to before 10,000 years ago are being discovered. There is little doubt that this part of the world was central to the development of pottery technology, only a few thousand years after it had been on the route for the first peopling of the American continent.



Left – Hard shale arrowheads from Odai Yamamoto. Already in the Palaeolithic, arrowheads were in use, presumably implying that archery had been invented.



Above – Stone axes and obsidian point from Odai Yamamoto.

Acknowledgements

I am grateful to Professor Taniguchi Yasuhiro of Kokugakuin University, Professor Charles T. Keally of Sophia University, Dr Tsutsumi Takashi of the Archaeological Heritage Section, Professor Takashi Inada of Okayama University, Mr Takayuki Yasutake of the Shibakawa Town Board of Education, the Miyota Board of Education and many other Japanese archaeologists for sharing their expertise and enthusiasm with me. The Cambridge conference was sponsored by the Japan Foundation and was part of the Jomon in Cambridge project, part of Japan 2001, for which major support was provided by the Daiwa Anglo-Japanese Foundation and the Great Britain Sasakawa Foundation.

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- Further information about Jomon archaeology will be available in English with the publication of a new book by Tatsuo Kobayashi and Simon Kaner, to be published by Oxbow Books in 2004. Details about the Sainsbury Institute can be found at www.sainsbury-institute.org

Books

After the Ice, A Global Human History 20,000-5,000 BC

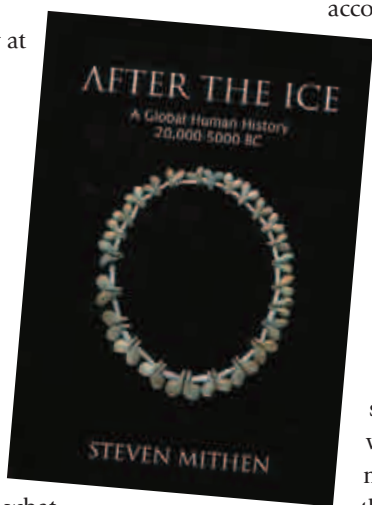
Steven Mithen, Weidenfeld & Nicolson £25.00.

What is the biggest leap forward ever to have taken place in the history of humanity? Steven Mithen, Professor of Early Prehistory at Reading University, believes that it was the explosion of human creativity that took place somewhere in the middle of the last Ice Age - after the Neanderthals had died out, and the only people around were anatomically modern humans. He made the case in his earlier book, *The Prehistory of the Mind*, which was extremely successful. Now he has set out to tell us what actually happened and in *After the Ice* he provides what he calls 'A Global Human History' from 20,000 to 5,000 BC.

This is a truly mammoth book, over 600 pages, which covers the whole world area by area, starting from Western Asia and Europe then going via the Americas and Australia, through South Asia and finally ending up in Africa.

I particularly enjoyed the chapters on America. Humans arrived late in America: it was the last of all the continents to be

colonised - right at the end of the last Ice Age. In 1933 mammoth bones were discovered in Clovis, Arizona, with very distinctive arrow heads stuck in them. Since then, Clovis points have been discovered widely in America, often associated with mammoth bones and with radiocarbon dates ranging from around 11,500-9,000 BC. But was there any pre-Clovis occupation? The search for pre-Clovis man has dominated American archaeology for the last generation, and he gives a masterful account of the search.



Virtually all the challenges can be discounted, save that at Monte Verde in southern Chile where there does seem to be clear evidence for human activity at 12,500 BC and possibly even earlier.

Clovis points also seem to be associated with one of the big mysteries of this period: the extinction in America

of almost all the big fauna - such as the mammoths, beavers the size of black bears, and camels - that roved America in the Ice Age. Were the Clovis people responsible for the mass extinction of the big game? He assesses the evidence and brings in a verdict of not proven either way. Of course the problem is not just in America. Everywhere except in Africa, the megafauna were extinguished: were humans responsible?

This review has concentrated on

America, but other parts of the world are similarly covered, describing the sites, the people, and the problems. The book is very well written in an extremely easy style. The one controversial aspect is that the author invents a sort of 'Everyman' to accompany him on his travels around the world. He calls him John Lubbock, after the great Victorian archaeologist and author of *Prehistoric Times*. The Everyman Lubbock carries with him a copy of *Prehistoric Times* as he travels through time, visiting the sites and places mentioned in the Victorian tome. Mithen thereby comments on how archaeological thought has moved forward since Victorian ideas of immoral Stone Age savages and suchlike, while also imagining how his modern Lubbock reacts to what he sees.

This blurring of history and fiction is a very fashionable literary device at present, and I must not be an old-fashioned grump and say that it does not work. What I would say is that it makes the book too long. When John Lubbock goes plashing through the undergrowth, listening to the birds twittering, I tended to turn off. However, I found that when Steven Mithen was speaking, describing sites and people, and weighing the evidence for and against, I found it fascinating. Steven Mithen has written a magnificent account of archaeology worldwide, and in this first edition of *Current World Archaeology* I am happy to hail the success of a great World Archaeologist.

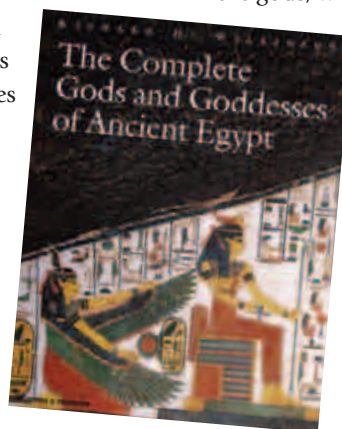
The Complete Gods and Goddesses of Ancient Egypt

Richard Wilkinson, Thames and Hudson £25.95.

How many Egyptian gods and goddesses were there? In *The Complete Gods and Goddesses of Ancient Egypt*, Richard Wilkinson, Professor at the University of Arizona, lists nearly 500 of them, categorised by type. The majority of them are anthropomorphic, divided between male and female. Then come the mammalian deities, followed by the avian (birds), until we get down to reptiles, amphibians and fish - and to the

frog goddess Heket, who assists in birth. As Juvenal said, "who does not know what monsters are worshipped by demented Egyptians? One lot reveres the crocodile, another goes in awe of the ibis".

The book is the latest in the splendid Thames and Hudson *Complete* Series to which Richard Wilkinson has already contributed *The Complete Temples*. There are 383 illustrations, 132 of them in colour, which



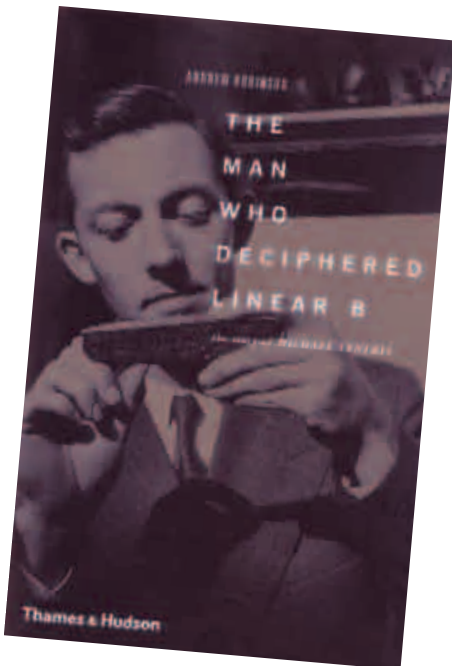
means that most of the gods he mentions have their picture recorded. The listing of the gods, which comprises two thirds of

the whole book, is prefaced by 70 pages of judicious introduction, looking at the rise and fall of the gods, how they manifested themselves, how they were worshipped, and their relationship with the kings. But why were there so many gods? God alone knows. . .

The Man Who Deciphered Linear B

Andrew Robinson, *Thames and Hudson*

£12.95



The decipherment of Minoan Linear B by architect Michael Ventris is one of the great dramas of 20th century archaeology. But who was Michael Ventris, and how did he do it? Andrew Robinson, the Literary Editor of the *Times Higher Education Supplement*, has now written a fascinating biography, **The Man who Deciphered Linear B**. Michael Ventris was born in 1922 into a well-to-do military family. His mother was half Polish - and artistic - so he was brought up to chatter away in Polish, but his father suffered from TB and went to Switzerland to find a cure. Therefore, Michael received his early education in Switzerland, so that by the age of 10 he was fluent in English, Polish, French and German. Being a superb natural linguist, he ended up speaking most European languages fluently. He studied Latin and Greek at Stowe, and at the age of 14 quizzed Sir Arthur Evans on the Minoan B tablets. His first major paper on the tablets, proposing that they were a form of Etruscan, was written when he was 18. However he also had other interests: his arty mother mixed with the Hampstead artistic set - Ben Nicholson, Henry Moore, and particularly Naum Gabo were all friends. Michael's interests were split: should he follow his artistic beliefs and

become an architect, or should he become a classicist and continue his attempts to decipher the unknown script?

He decided to become an architect and enrolled in the Architectural Association, already a hotbed of modern architecture. But then the war intervened and he joined the RAF, surviving a tour of duty bombing Germany in Halifaxes in 1945.

After the war he returned to architecture. At first it was very exciting; a brave new world of socialism and modern architecture was being constructed and he wanted to take part in it. He did not, however, have the talent to become a great architect; his strength lay as an organiser.

Gradually his interest in Minoan script reasserted itself. This was the crucial time for the decipherment. The script had originally been discovered by Sir Arthur Evans, but as he grew older, Evans sat on these discoveries, hoping to decipher them himself. Then, dramatically, more tablets were discovered, this time by the American, Carl Blegen, at Pylos. The lure of the tablets gripped Ventris. Although by now he had a wife and two young children, he decided to give up architecture and live off his private income for a year or so and devote himself full time to the decipherment of the tablets.

He had two main methods of working, both with precedents from his architectural training. The first was the concept of 'group working'. With extraordinary generosity he established a system of 'Work Notes', which he sent out to his colleagues and possible rivals round the world.

The other technical device was that of a grid. It had long been clear that Linear B was a syllabary- that is each sign represented a combined consonant and vowel. How did they fit together? He devised a grid with five vowels across the top, V1 - 5 and fifteen consonants down the side, C1-15 . His grids were drawn up with architectural precision, and lettered with his superb lettering ability. He worked solidly, producing Work Notes at the rate of about one a month. Then suddenly, in March 1953, when he was about to produce Work Note 20, the breakthrough was made. Some of the signs appeared to be the names of places.

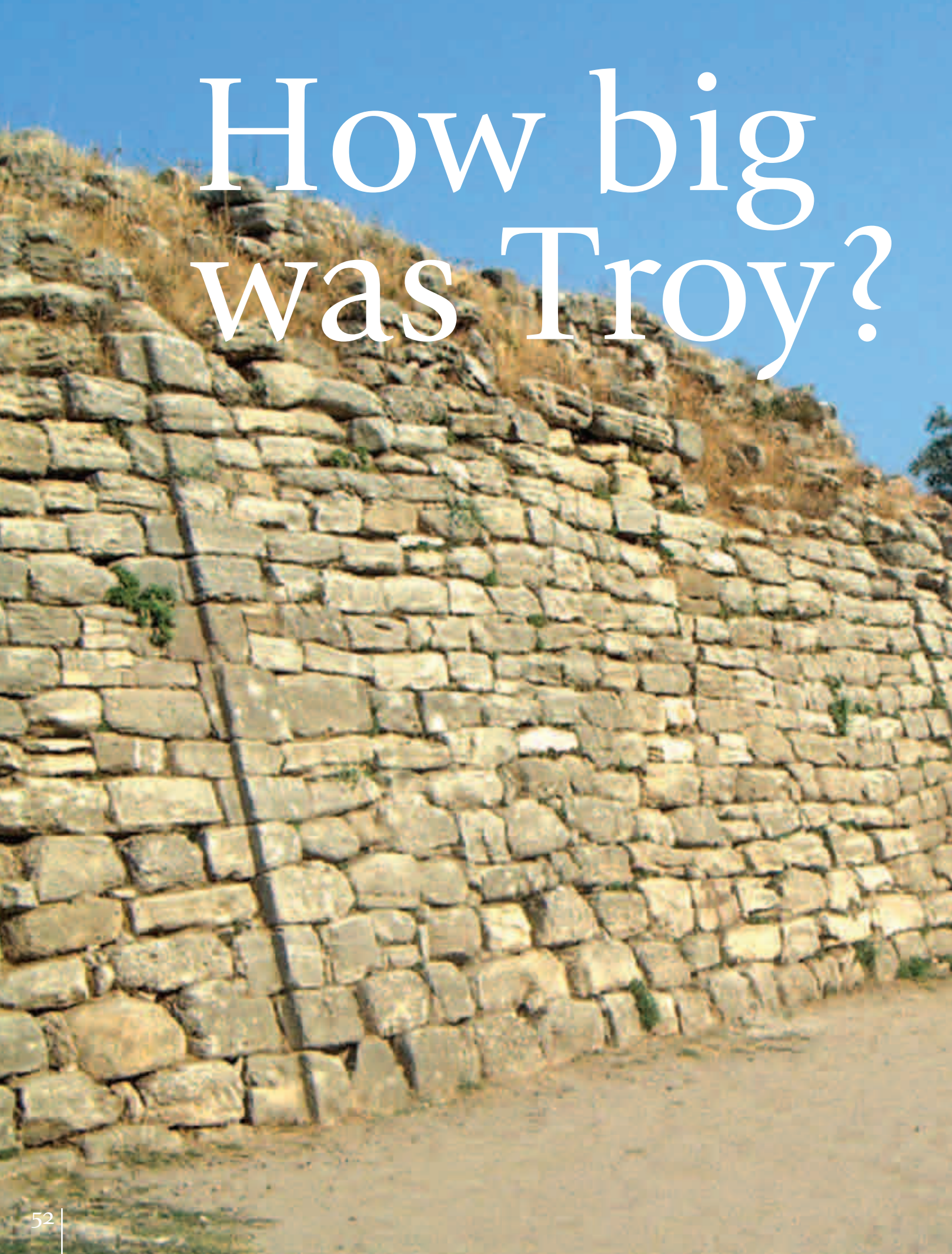
How about trying to see if they fitted the names of the Cretan towns in the classical period? He tried out Amnisos, the port of Knossos. This fixed several positions on the grid: he applied these to another group, and the word Knossos emerged. In a rush, more Cretan towns emerged - Tu-li-so (Tulissos), Pa-i-to (Phaestos), and Lu-ki-to, Luktos. On June 1st, he sat down to type what would turn out to be his final work note, number 20, and boldly titled it "Are the Knossos and Pylos tablets written in Greek?". He called this merely a frivolous digression, but rapidly more and more words began to fit in. Carpenters, wainwrights, chairmakers and bakers made their appearance, as did Father (pa-te) and the people (da-mo).

A BBC producer happened to come to dinner. She realised she had a scoop, and on the 1st July 1952, the decipherment was announced on the Third Programme. At Cambridge, a young scholar of early Greek dialects, John Chadwick, heard the programme, and immediately offered to help. A pioneering book, *Documents in Mycenaean Greek*, was written jointly by Ventris and Chadwick, and published by the Cambridge University Press.

The world was at his feet, but which way should he go? The academic world did not entice such a free spirit, so he returned to architecture, but at the end of six months, he was becoming disenchanted. On the 5th September 1956, he left his new house late at night, and driving fast down the Barnet bypass, crashed into the back of a stationary lorry, and was killed instantly: he was only 34. The suspicion remains that if it was not exactly suicide, it was something close to it. Should one recall perhaps that other frustrated classicist, Lawrence of Arabia, killed on his motorbike?

Andrew Robinson, the literary editor of the *Times Higher Education Supplement* has written a superb biography of Michael Ventris, combining a warm account of his life with just enough technical details to satisfy those who have knowledge of linguistics or indeed of the classics. It is a splendid read, and a fine memorial to the split personality that enabled Ventris to decipher Minoan Linear B so triumphantly.

How big was Troy?



The walls of Troy as revealed by Schliemann. These impressive walls only enclosed a comparatively small area. Was there also a lower city where most of the population lived?

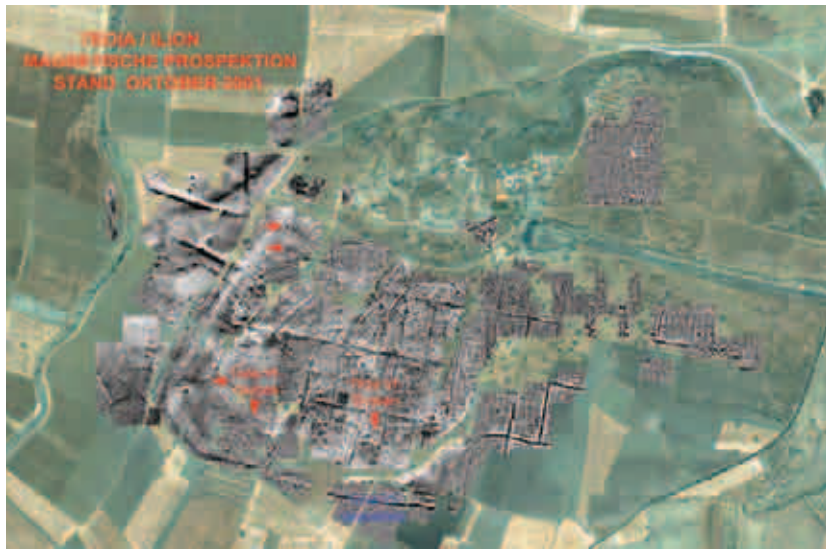


When Schliemann began his excavations in 1870, he found a large mound projecting out into the plain, and it was this that he excavated. However, was there a much bigger city on the lower ground just outside Troy? Professor Manfred Korfmann of the University of Tübingen who has been re-excavating there since 1988 is sure that there has been found enough of a very much larger city to make it more than ten times as big as the traditional size. Not all are convinced, and when a major exhibition was held in Germany in 2001–2 on Troy: *Dream and Reality*, there was considerable dissension. The non-believers, headed by the historian Frank Kolb, also of the University of Tübingen showed up – via newspaper interviews. The controversy had the usual result: the exhibition was a huge success, attracting over 850,000 visitors. But what is the archaeological evidence – and the archaeological problems – of locating the Bronze Age city of Troy?

Troy has been dug in three major expeditions. The first and most famous was that carried out by Schliemann and his architect Dörpfeld from 1870 to 1894. Then from 1932 to 1938 an American team led by Carl W. Blegen of the University of Cincinnati added to and illuminated Schliemann's work. Subsequently from 1988 onwards it has been excavated by a German team led by Manfred Korfmann of the University of Tübingen, joined by Professor Brian Rose who is Blegen's successor at the University of Cincinnati; Korfmann concentrates on the Bronze Age, while Brian Rose looks at the Graeco-Roman town when Troy became a big tourist attraction for the Romans.

Troy appears today as a mound projecting out of the surrounding plain where the Trojan wars were fought. However more detailed examination shows this is somewhat misleading. Basically, Troy is a low plateau of limestone, on one side of which is a mound that forms the Troy as known to Schliemann. There are, in fact, three levels: the plain, the plateau, and the mound to one side: is the plateau the site of a 'lower town'? Certainly it has long been recognised that the Lower Town has always been occupied by a Graeco-Roman city, for it is covered by sherds of Greek and Roman pottery. Was it also the site of a Bronze Age city?

Prehistoric sherds lying around, together with Greek and Roman pottery, indicate not only extensive settlement activities but the limits of that settlement. The recent work began with an extensive magnetometer survey of the whole area



Aerial view of the site of Troy. The green area at the top criss-crossed by grey paths is the actual citadel. The area of the lower city has been superimposed with the results of the resistivity surveys. These show with startling clarity the layout of the Roman city. Are there traces of the Bronze Age city on a different alignment underneath?

of the Lower City. This revealed in startling clarity the layout of the Greek and Roman Town with its regular alignment of *insulae*. However, in places there were just a few rather fainter hints of a layout on a different alignment. Was this the alignment of an earlier "Mycenaean" town? The recent campaigns have been aimed at investigating these faint traces.

There are problems. These are mainly to do with the later Roman town. For one thing, the Greeks and Romans left an awful lot of rubbish, so that there is at least a one to two metres of build-up over the underlying limestone, and the extensive Graeco-Roman deposits need to be removed to reveal the underlying Mycenaean. The even bigger problem is that many of the Roman houses were built with Roman thoroughness and their foundations chopped through the underlying deposits; as a result, it is quite improbable that a complete plan of a "Mycenaean" building will be discovered. Settlements were built again and again here for about 700 years, starting from the first systematic city layout some time before 200 BC, up

to 500 AD. These represent about 25 generations. And there were about 700 years of decay and a new start in Byzantine times, about 1200 AD. There was an exploitation of former stonework and especially foundations. Thus whenever remains of Bronze Age houses were found, they were dug out, and the stones used again.

The evidence for the Bronze Age town comes in three main features – the houses, the defences, and the wells. The most extensive house remains come from a large area excavation of a rambling Roman house just inside the protected area: roughly half the middle city is specifically protected under Turkish law, the other half is not. Here two walls at right angles were located underlying the later walls at a different alignment, though on the same alignment as the putative remains revealed by the magnetometer survey. They were accompanied by late Bronze Age pottery and a range of radiocarbon dates of the 13th century BC. Unfortunately the later Roman foundations had cut away the rest of the house.

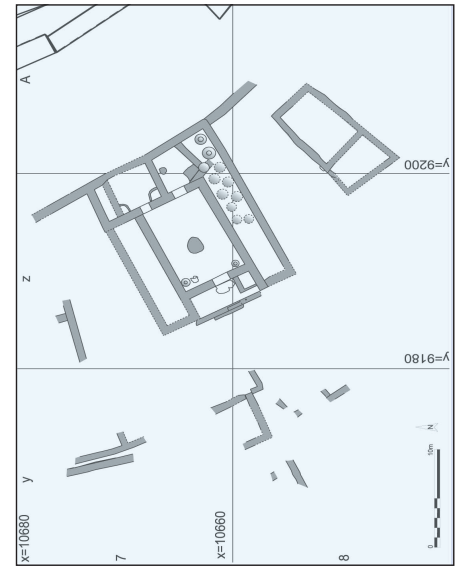
There was, however, one very intriguing earlier discovery. Running across the opposite corner of the area, on a different alignment, was a row of postholes, cut down into the rock, and fronted by a palisade slot. This was accompanied by a few sherds of early Bronze Age pottery, while radiocarbon dates centering on 2,600 BC were obtained; this makes it equivalent to Troy I or II, the thriving Early Bronze Age city to which Schliemann's famous treasure should be dated. Is it possible that even at this early date, the lower city was already occupied?

The most complete houses of the late Bronze

Right – Excavating in the lower city has problems, here starkly revealed. All the visible walls are Roman, robbed from the earlier remains. The Homeric city must be traced from the robber trenches beneath.

Far right – The area excavations revealed yet further problems. The line of postholes running diagonally across the trench underlie the Mycenaean remains, and are carbon-dated to around 2,900 BC. These must be part of an even earlier city, of Troy II date.





The best remains of the Mycenaean town were found directly outside the walls of the Mycenaean city, here seen at the top of the picture. The plan shows a building not unlike the Mycenaean megaron, the central hall. The building was preserved because the area was covered by a Roman altar base, seen at the centre with the two Roman wells, centre right.

Was Troy Mycenaean?

It has long been assumed that Troy was essentially a "Mycenaean" city because a certain amount of high class Mycenaean pottery accompanied the remains. The former excavator, Carl W. Blegen, was convinced, "that the founders of Troy VI were Greeks – the earliest of their race to gain foothold in Asia Minor". Yet did this "Mycenaean" pottery really come from Greece?



Sherds of typical Mycenaean pottery suggest that Troy was essentially a Mycenaean town. However, recent analysis of the clay suggests that most of it was made locally.

Recent analysis of the clays suggests that virtually all the Mycenaean pottery was in fact made locally. The styles of the decoration closely parallel decorative styles in Greece itself, at least down to the middle of Troy VI, but even if the fashions came from Greece, the pottery was made locally.

In any case this Mycenaean pottery only formed a very small proportion of the total pottery discovered in Troy. The majority of the wares are fine wares, the best known being the grey wares. These used to be called

grey Minyan wares until it ceased to be fashionable to name pottery types after the place where they were first discovered or after an assumed connection (here with the mythical king Minyas from Orchomenos in Boeotia, whose ship contingent took part in the Trojan War). Today we call it Anatolian grey ware.

Equally common however are the similar 'Tan' wares in a reddish/tan-coloured fabric.

Penelope Mountjoy has been tracing the distribution of these in Western Anatolia, (that is, Turkey), and has shown that they extend down most of the Aegean coast. Indeed this was originally



Two of the best known local pottery types are the Anatolian grey wares (above) and the tan wares (below). These are extensively distributed along the coast of Anatolia.

discovered as long ago as the early 1960s, when Nicholas Bayne wrote his pioneering doctoral thesis at Oxford on the Grey Wares of the north-east Aegean. Now, thirty years later, when he has become Sir Nicholas Bayne after a career in the civil service which culminated as High Commissioner in Canada, his doctoral thesis, much to his surprise, has now been published.

Was Troy Wilusa?

In the Classical world, Troy had two names; Troia (Troy) and Ilios or Wilios – hence the Iliad. Is the name of Wilios preserved in Hittite documents which appear to refer to the place and area as Wilusa?

Much work has been done recently on Hittite geography demonstrating that the Hittite names often reflect the later Greek names. A breakthrough came in 1997 when David Hawkins, Professor of Ancient and Anatolian languages at the London School of Oriental and African Studies, translated for the first time the Karabel rock inscription. This inscription, first reported in the 1840s, is situated in a pass to the north east of Ephesus and dates to around 1300 BC. It appears to be a boundary inscription, marking the boundary between Mira, the land of Ephesus to the south, and the Seha river lands to the north.

Three other names are of particular interest: Millawanda is probably Miletus, 50 miles to the south and Apasa, which is probably Ephesus. Then to the north there is an area called Wilusa: opposite is Lazba, which is probably Lesbos, the nearest major island to Troy.

Then around 1280 BC, the extremely powerful Hittite Empire concludes a state treaty with King Alaksandu of Wilusa. From this moment onward the latter became a vassal state of the Hittites, and only five years later Egyptian sources record a contingent of war-chariots from a place named Dardaniya, taking part at the battle of Qadesh in Syria. Is not Dardaniya another name for Troy, deriving from the Dardanelles, and the mythical mother city of Troy, Dardaniye?

The most controversial name in Hittite texts is that of the Ahhiyawa : are they the Achaeans, that is the Greeks? Debate rages on this subject, but it does appear that the Hittites were well aware of the Greeks, who were a powerful force on the islands off-shore western Anatolia.

Age were discovered just outside the walls of Troy VI, where the remains had been covered by later Greek and Roman dump and thereby preserved. Behind them the Troy VI citadel wall rose up, so they were standing in their "shadow", and protected by them. Furthermore the buildings that overlay them were official, long-standing buildings, like temples, the council house and a small theatre, and these were not rebuilt so frequently.

The largest area of the Mycenaean lower town was that excavated underneath these temples, revealing a central courtyard surrounded by rooms, in two of which there were the remains of a series of large *pithoi* or storage jars, evidence for the existence of a house of some standing. The entrance area had an impressive threshold of stone. But there were many other houses around, identified by sections of walls, floors, and storage facilities.

The Defences

The second major evidence for the Late Bronze Age town lies in the discovery of a defensive u-shaped ditch. This shows up as a meandering line on the magnetometer survey, though the meanders appear to accompany the contours. Nevertheless this ditch goes up and down quite remarkably. Excavation in a number of different places have revealed this as a rock cut ditch going down well over a metre into the underlying limestone. They have even discovered the position of a gateway about 10 metres wide, where the ditch ends, and a remarkable square cut terminal, matched by a similar square cut terminal where the ditch resumes. The critics would like to see this as a water



The lower city is bounded by a defensive ditch. However, this is not continuous but is cut through by a number of entrance ways such as that shown here.

course, but if so it is difficult to understand this obvious break in the sequence and the variation in height. Up to now the existence of the surrounding ditch is proved for a length of 700 metres!

The third and most mysterious evidence for earlier activity comes from a couple of wells that are linked at the bottom by an underground water channel. This comes out at the side of the hill at a point where the water is still running and where the Romans constructed a series of fish ponds. What is the date of this feature? A crude form of dating can be obtained from the shape of the wells. Three of them are round and one is large and rectangular, and the usual rule of thumb at Troy is that wells with circular shafts are Graeco-Roman, while wells with rectangular shafts are late Bronze Age.

In order to try to date the system of shafts and tunnels, the excavators turned to one of the latest scientific techniques that enables one to date stalactites and stalagmites. There are numerous stalagmites formed on the roof of the channel and some were submitted for uranium/thorium dating, which gave a starting date of around 2,900 BC and ending in Roman times. This is much too early for the late Bronze Age city but would fit in nicely with the early Bronze Age material of Troy I and II. That means that the first builders of Troy made parts of this water system work, and that this was in use still in "Mycenaean" times, and even later on, up to Roman times. The energy needed and the knowledge involved supports the fact that the people of the Troy I/II settlement considered it worthwhile to have access to water up on the ridge. This can only mean that a considerable settlement, a lower town already existed in these early days.

The Graeco-Roman town

While the search for the "Mycenaean" city has been continuing on the lower ground, Brian Rose and his colleagues from the University of Cincinnati have been investigating the Graeco-Roman city of the time when Troy became a tourist attraction. The earliest known tourist at Troy was ironically the Persian King, Xerxes the Great, who in 480, before his attempted conquest of Athens, called in to pay tribute to the site of the earlier clash of Asiatics and Greeks. Subsequently a great temple to Athena was built on the top of a mound, the foundations of which almost certainly removed all traces of the "Mycenaean palace". However since most of the



Under the lower city is a long water tunnel. The aerial photo (top) shows the course of the tunnel, with the mouth bottom left. The second photo shows the actual mouth today, the third shows a view into the tunnel, while the bottom photo shows one of the shafts.



In the Roman period an extensive sanctuary was built outside the walls covering the earlier houses. Here two circular wells can be seen in the foreground, where the pilgrims purified themselves before entering the rectangular shrine, middle right.

temple was removed by Schliemann, the possible underlying palace remains hypothetical. But once Augustus and Virgil decided that the Romans were descended from Aeneas, and that Aeneas was a Trojan fleeing the sack of Troy, Troy turned into a major tourist centre: it became the very source of the Roman Empire, and as such it flourished mightily in the Roman Era.

Two particular aspects are currently being studied. One is at the North East Bastion, perhaps the greatest of all surviving bastions of "Mycenaean" Troy, where a steep stone staircase running up the outside was excavated by Schliemann, who did not make much sense of it. Recently Brian Rose has been able to work out the story. The *Iliad* records how Ajax dragged Cassandra from the cult statue of Athena, where she had sought protection, and murdered her, thus

violating the sacred area. This crime had to be atoned for. Thus the townfolk of Locris in central Greece, from which Ajax came, every year sent over a bevy of virgins to tidy up the temple. They had to do so while avoiding the gaze of the cult statue of Athena. Hence the external staircase where they could climb down to the well, fill their buckets with water and make their way round the back of the temple, and tidy everything up without being seen by Athena.

The other major recent excavations have been at the south western corner of the town, where a sanctuary probably of Cybele has been excavated. Here there were two linked sanctuaries, each containing a prominent well from which the pilgrims could purify themselves. After purification, they then left the sanctuary and climbed up to a dining room at a higher level

Troy's Trade

Where did Troy belong? It has long been thought that Troy was essentially part of the Mycenaean world, but as the box on page 55 demonstrates, much of the 'Mycenaean' pottery was in fact made locally. But the box on page 56, *Was Troy Wilusa?* suggests that Troy was really part of the Hittite world as it was named in Hittite documents. Yet there is no Hittite pottery at Troy, perhaps because the Hittites did not export pottery – and there is little other Hittite material either. Instead, the strongest connections are with the similar towns on the Anatolian, that is Turkish, coast – Ephesus and Miletus. A considerable amount of Trojan Grey Ware has been found in this area, and also down into Cyprus and the Levant, though little has been found in Greece itself.

High quality finds however are more controversial – indeed these form the heart of the current controversy. Part of the trouble is that relatively few foreign objects have been found in Troy, and thus the critics, such as Kolb, argue that this means that Troy was never a major trading city. Korfmann however points out that the important areas, such as the central part of the citadel where the palace once stood, were destroyed by the

construction of the Greek temple or were excavated in the early days of the work. There are indeed some high quality small finds such as ivory objects, ostrich eggs, faience vessels and beads of faience, glass and cornelian, which suggest that Troy was part of, or perhaps the northern extent of, the widespread trade in the eastern Mediterranean.

More difficult is the question whether there is trade across the Hellespont to Europe in the north. Korfmann argues that there is some, though the quantity is small. Even more difficult is whether there is evidence of trade through the Bosphorus to the Black Sea: are there objects from the Black Sea area in Troy, or objects from Troy in the Black Sea area? Culturally, no doubt, Troy was part of the Greek Mycenaean world, as the Mycenaean pottery styles indicate, but it should, perhaps, best be seen as a flourishing Greek-influenced fringe on the Hittite Empire, but with its main connections down the coast and into the wide east Mediterranean area. However, it would seem that Troy was never what the theorists call a 'port-of-trade' - that is a town living off trade. Instead it was a typical Bronze Age city, dominated by agriculture - which is precisely what Homer implies.



One of the most impressive walls of the Homeric town is this north-eastern bastion. But what are the steps doing alongside it? They were built in classical Greek times to enable a priestess, atoning for the sins of Ajax, to get into the temple unseen by the statue of Athena.

where they could dine on the animals they had sacrificed. It was the spoil from the construction of this dining place that preserved the remains of the earlier "Mycenaean" house.

The sanctuary, as indeed much of Troy, suffered a major disaster in 85 BC, when it was destroyed by the rebel Roman general Fimbria, but it was rebuilt bigger and better by Augustus in the early first century AD, and his altar base now dominates the site. He also constructed a viewing platform with tiers of seats from which the spectacles could be viewed, but this has been removed to reveal a well-preserved length of the wall of Troy VI underneath.

In conclusion, how do we assess Bronze Age Troy today? To anyone coming from the East, from the Hittite Empire or beyond, Troy would have seemed a somewhat ordinary town, medium to small by Hittite or Near Eastern standards. To someone coming from the north, however, from Europe, it would have seemed absolutely fabulous – something bigger and more sophisticated than anything to be seen in contemporary Europe. Perhaps we should see Troy as the Hittites might have seen it, as part of a tolerated group of satellites – probably speaking Luwian – along the Aegean Coast. The best known of these apart from Troy is Milawanda – the Greek Miletus, where Professor Wolf-Dietrich Niemeier, the director of the German Institute in Athens, is uncovering extensive remains of a Mycenaean Town and its earlier Minoan predecessor. Ephesus was probably

Apasa, and there must have been at least one town in what they call the Saha river basin, perhaps either Pergamum or Sardis. A programme of field walking in this whole area could prove very illuminating.

But we should not be too surprised that no complete Bronze Age house has yet been discovered in the lower city. Brian Rose who is also investigating the Greco-Roman remains points out that he has not discovered a complete Hellenistic or Roman house either. They were all robbed away in the late Roman period when the builders realised that robbing older houses was easier than quarrying fresh stone. What he also points out, however, is that whenever he digs in the Roman town, he always finds Mycenaean pottery mixed in the debris, mostly cooking vessels, table wares, and water jugs – in other words, debris from households, specifically kitchens.

Troy still generates enormous excitement because of Homer. There is now a general consensus that the *Iliad* and the *Odyssey* were composed by a single person presumably called Homer in the 8th or 7th century BC, even though they were not written down until a couple of centuries later. Nevertheless they reflect a Bronze Age of four or five centuries earlier. The recent work confirms that a large town which the Hittites probably called Wilusa existed on the site that the Greeks and Romans identified as being Homeric Troy. It was probably rather larger than has hitherto been allowed.

Further Details

Troy can be visited from the town of Canakkale, 20 miles away. It is possible, also, to stay at Troy itself, at the traditional Hisarlik Hotel.



Source:
Professor Manfred Korfmann, University of Tübingen and Professor Brian Rose, University of Cincinnati. Email: troia.projekt@uni-tuebingen.de

Pictures courtesy of The Troia Project and Andrew Selkirk



Angkor Wat

The great temple of Angkor Wat, built around AD 1150 is one of the marvels of the world: but what are its origins? How much does it owe to Indian influence or how much is it the product of the local population?

What is the origin of Angkor Wat? The great temple of that name, and the city in which it is set, are one of the great marvels of the world – but where did it come from, and what were its origins?

When exploration began in the 18th and 19th centuries, it was quickly obvious that there was strong Indian influence. The numerous inscriptions were written in an Indian script and many of them were in Sanskrit, the sacred language of the Hindus. Furthermore, the temple was established to Vishnu, a Hindu deity, and also included statues of Buddha. There was clearly strong Indian influence, but did this also imply an Indian invasion?

In 1922 Albert Foucher was in no doubt of it and spoke of Indians coming to civilize 'a savage population of naked men'. Later scholars reached a similar conclusion, though more cautiously. Thus George Coedes, the doyen of Angkorian studies who did so much to collect and study the inscriptions and to try and reconstruct a history from them, suggested that there was 'a steady flow of immigrants that resulted in the founding of Indian kingdoms, using Sanskrit as their sacred language'.

How far is this true? In the past generation invasion theories have been under attack; should they survive in Cambodia? Just how far was there Indian influence? And what was the condition of the native inhabitants before Angkor rose to prominence? An archaeological project, headed by Charles Higham of the University of Otago in New Zealand and the Thai archaeologist Rachanie Thosarat, is seeking to unravel these problems.

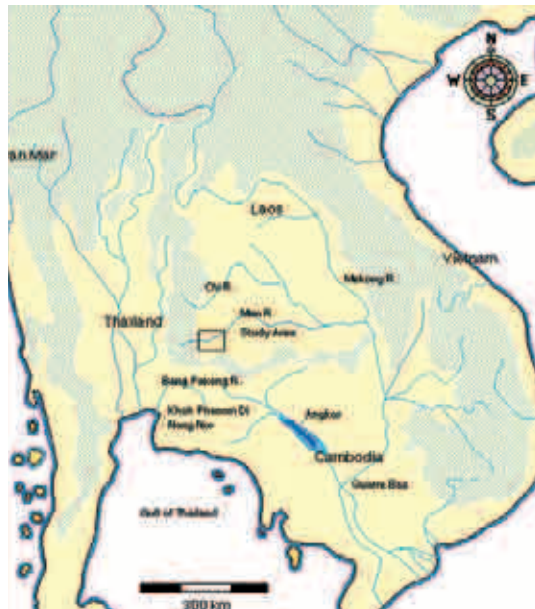
What is Angkor?

The secret of Angkor rests in its exceptionally fertile position. It lies just beyond the banks of the Tonle Sap, or Great Lake, which is not only the largest lake in south-east Asia, but also one of the largest in the world. The Tonle Sap is subject to a strange and unusual phenomenon. It lies along one of the principal tributaries of the great Mekong river, but every year at the time of the monsoon, the river goes into reverse, and the water from the Mekong flows back up its tributary, thus increasing the size of the Great Lake many times. When the water level recedes, the land is

ideal for rice cultivation in great abundance.

There are three main features at Angkor. Best known is the impressive temple of Angkor Wat itself, built by Suryavarman II, the greatest of all the kings of Angkor between his accession in 1113 and his death in 1150. However this is only part of the whole complex. There is also the great city, with its walls and temples and houses. It once contained the great palaces, though as the palaces were of timber, none has survived. The third feature, in its way equally remarkable, are the three huge artificial lakes that are found in the vicinity. These are the subject of immense controversy. Were they essentially functional – reservoirs to provide water in times of famine? Or were they ritual? At the centre of each was a temple set on an island: do these reservoirs represent the Hindu mythology?

When Charles Higham came to investigate the origins of Angkor Wat, he had two main starting points. Firstly, modern politics meant that it was not possible to excavate in Cambodia due to the revolution of the Khmer Rouge. However was it possible to excavate just to the north across the



border in modern Thailand? On this subject there is a crucial article in *Antiquity* (1950) written by Peter Williams-Hunt who had plotted a number of irregular earthworks along the valley of the River Mun. Did these provide the origins of the water management involved in the reservoirs of Angkor? Charles Higham decided to excavate along the Mun river, itself a tributary of the Mekong, the next north to the Tonle Sap River. Three sites in particular proved extremely fruitful.

Angkor is situated beside the Tonle Sap, the Great Lake of Cambodia. The river is a tributary of the Mekong River, but the recent excavations have taken place in the 'study area' on the Mun River, in modern Thailand.

Ban Lum Khao: Bronze Age beginnings

Rice cultivation probably began along the Yangtze valley in China sometime around 8–6,000 BC, but it is not until 4,000 years later that rice cultivation is seen in South East Asia. To get a glimpse of life in the Bronze Age, the project began digging a small sector of a large site known as Ban Lum Khao. This soon revealed an impressive cemetery: 112 burials were excavated, containing over 400 complete pots – with most burials containing several pots. Most spectacular were some infant burials set just above the head of an adult, in huge pots up to 0.5 metre in diameter.

But even if the burials were more eye-catching, the most interesting part of the evidence came from the underlying settlement. Here the important result came from the analysis of the animal and fish bones: the animal bones were mostly of wild animals, suggesting that the occupants were the first settlers moving into virgin territory. Similarly, the fish bones were much larger than their modern counterparts, indicating that the settlers were probably fishing in rivers which had not been fished before.

The overall impression, therefore, is that this is still a relatively simple society. No bronzes were found in the burials, though there were signs of smelting: there was little evidence for differences between rich and poor within the burials. The most interesting evidence for trade lay in a number of sea-shell bangles that had been buried with the dead as ornaments and which must have been derived from the sea, 500 miles away.

Some of the fine Bronze Age pots excavated at Ban Lum Khao.



Noen U-Loke: The Iron Age and water management



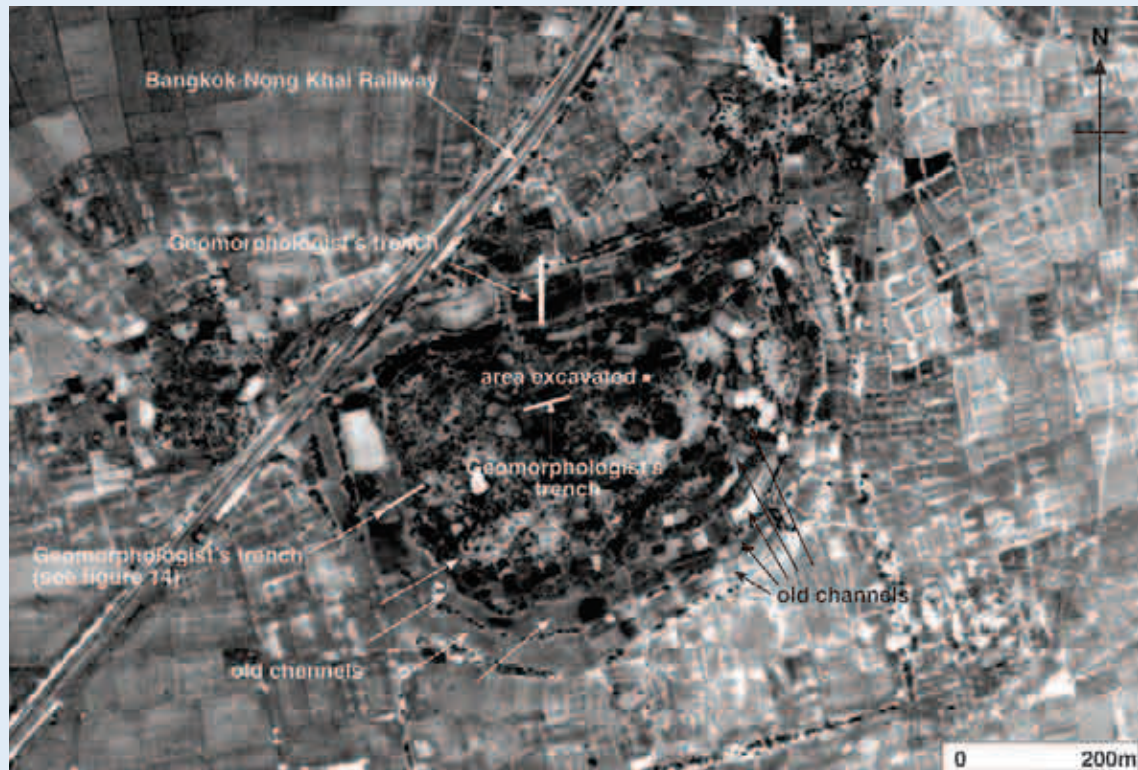
One of the most remarkable features at Angkor are the huge reservoirs known as barays. These do not appear to have any parallels in India. Are they then the best example of a purely local feature of the Angkor civilisation? Interest in water management was stimulated by Williams-Hunt's 1950 *Antiquity* article on irregular earthworks: further examination shows that many of these (see below) were moated sites, with moats rather excessive for any functional purpose.

However, the most spectacular and fruitful excavation has been at Noen U-Loke, where a trench 200-metres long and up to six metres deep was dug in a single day by a mechanical digger, and hastily examined before it filled up again with groundwater. This procedure was repeated at five other moated sites in the study area by Professor William Boyd, the project geomorphologist. The sediments and the radiocarbon samples revealed that the banks were constructed during the Iron Age, between about 200 BC and 500 AD, to divert and control the rivers that flowed past the settlements. In the interior of Noen U-Loke, large

Left – One of the very rich burials at Noen U-Loke. This was a rice burial in which the body was buried in a bed of rice.

However this burial (14) also had three bronze belts, 150 bangles spread down each arm, numerous finger rings and, most significant of all, an iron knife.

Several of these moated sites have been excavated and two in particular proved very fruitful. Non Muang Kao is a huge site, 50 ha in extent, rising seven metres above the surrounding paddy fields: the name means 'mound of the ancient city'. A section through the wide moats that surrounded it suggested that they had been created by building banks; these controlled water that flowed past the site. It appears that the site had been surrounded by water in its hey day in the late centuries BC and early centuries AD, and at least some of these moats must have been deliberately created.



ANGKOR WAT Time line

c.7000 BC	—	Rice cultivation begins in the Yangtze Valley.
2300 – 2000	—	Arrival of rice farming communities in Cambodia,,
1500 – 500 BC	—	The Bronze Age of South-East Asia.
150 – 550 AD	—	The rise and fall of the delta state known as Funan; the site of Oc Eo occupied
802	—	Traditional date for foundation of kingdom of Angkor
c. 1150	—	Great Temple of Angkor Wat is constructed.
1431	—	Angkor destroyed after Thai invasion.

area excavation revealed a cemetery with 125 inhumations, with dates spread over the entire millennium of the Iron Age, beginning in about 400 BC. The most common, though bizarre, type were the rice burials. Here the grave was dug, and the base was covered with a layer of burnt rice. The body was then inserted with grave goods and finally covered with rice. Many sackfuls must have been involved – a spectacular display of conspicuous extravagance – a real potlatch, to adopt an American term.

Many of the burials were rich in a more conventional fashion. Indeed, one of them went right over the top. He was a young man buried with 75 bronze bangles on each arm, covering armpit to wrist. The finger bones were dense with rings, and

the toes bore large bronze rings. Around his waist, he had not one, but three, belts of bronze, and many glass beads. His ear coils were of silver, covered in gold, and he was accompanied by superb eggshell thin pottery vessels. Perhaps most significant of all, there was a single iron knife.

In comparing the site with the earlier Bronze Age site, the biggest change comes with the animal bones. By now, wild animals were virtually absent and instead, there was a predominance of cattle. Cattle and rice formed the basis of the agricultural economy. There was wide-spread evidence for iron smelting, though surprisingly, there was no evidence for pottery manufacture: the very fine thin pots must have been made elsewhere, presumably by specialist potters. However, there was also evidence for salt manufacture on a commercial scale. Did salt and iron form the currency with which they carried on their exchange? It was a rich community, ready to begin what archaeologists see as the rise to complexity.

Right – Burial 69, another rich burial. This one was a male with four bronze belts, many bronze bangles and finger rings.

Far right – Burial 113. This time a woman, with gold and agate beads as a necklace, agate neck pendants, silver and bronze bangles and lots of superb eggshell-thin pots, seen above her head.



Source and photos:
Professor Charles Higham of the University of Otago in New Zealand (and Thai archaeologist Rachanie Thosarat).
Email: charles.higham@stonebow.otago.ac.nz

The Origins of Angkor: Indian or Khmer?

King Suryavarman fronted by two horses, being carried through a gateway – a good example of the Indian influence.

Around 200 AD the pace intensified. In the south of the region, in the Mekong Delta, sites of an altogether larger size began to appear. The largest is that of Oc Eo, a walled city three kilometres long, by 1.5 kilometres wide, surrounded by ramparts and ditches and bisected by canals. In the 3rd century AD, the area was visited by the Chinese, who called it Funan. And from the 5th century onwards, the first Sanskrit inscriptions attest the strengthening of Indian influence.

Yet the evidence of the inscriptions is ambiguous. Although they are written in an Indian script, they are written in two different languages, and as Charles Higham points out, the two languages are entirely different – as different as



English and Japanese. Sanskrit is, after all, one of the Indo-European languages, whereas Khmer is part of the Austroasiatic group, which includes Vietnamese. The high status inscriptions are in Sanskrit, whereas the more mundane ones are in Khmer - the language of the Cambodians. The kings - titled "Varman" - are recorded in Sanskrit, while the workers are mentioned in Khmer, with names such as Dog, Stinker, and Black Monkey. Yet there are hints of a stronger Khmer background, in particular in the use of the word Pon, which means something like 'Great Lord', and which appears to be derived from an older Khmer substratum of society. Then around 550 AD, the civilisation in the delta appears to collapse and progress takes place in the valley of the Great Lake. And from 800 AD, Angkor itself began to rise to pre-eminence.

The Indian influence in the Angkorian civilisation cannot be denied, though one should note that no Indian colony has yet been discovered. However, the Khmer contribution is far more substantial than has been allowed before, and in particular the emphasis on water management maybe derived from local practices.

And when Angkor was besieged and finally destroyed by the Siamese in 1431 and the splendour of the court was transferred to the Siamese kingdom (shades of *The King and I!*) it was the Khmer language and people that survived in Cambodia today.

The Western Baray, one of the huge artificial reservoirs, built about 1000 AD. This view, from the temple on the island in the middle, looks across half the expanse of water. Does this massive water engineering point to local Kmer influence?



The central shrine of Angkor Wat, the zenith of the two traditions.





The chance to compare the archaeology of Albania with another ex-communist country, the Ukraine, came out of the blue. Butrint in Albania and Chersoneses in the Ukraine belong to the small portfolio of major archaeological projects supported by the Packard Humanities Institute (PHI). I have been excavating at Butrint, and PHI invited me to visit Chersoneses, so I eagerly accepted; with me came John Camp, the Director of the Athenian Agora project, another PHI-supported project.

First, though, to my surprise I needed to buy a visa at an Ukrainian embassy. This meant a two-day jaunt from Butrint to Athens and an 80 euro fee. Visitors to Albania by contrast, coming to see Butrint, pay 10 euros for a visa on arrival in Saranda, the nearest port. Thus tourism to Butrint is prospering, with an estimated 14,000 foreign visitors this year as well as a staggering 40,000 Albanian and Kosovan visitors: the ticket revenues fund not only conservation and security but also popular concerts. Ukraine and Chersoneses on the other hand are unlikely to prosper from international tourism if they make entry as time-consuming as this.

Still, the embassy trip to Athens afforded me the opportunity to visit the Agora project in John's company. Forty graduates from all over the States

Lifting the curtain: a letter from two ex-communist countries

were participating in a structured programme invented nearly 75 years ago. The multi-period urban excavation was supported by a very well-organised finds processing system worthy of a German museum. This is a classical mecca for most American students of classics and classical archaeology, now being updated with a website and supporting data base (www.agathe.gr) used by several course modules in U.S. colleges. (Why, I wondered, has the British Academy not instructed the British Schools to develop similar integrated teaching programmes to resurrect classical archaeology in Britain?)

Our season at Butrint ended as I left for the Ukraine. It was the hottest season ever, and more than fifty Albanian students had participated. The excavations were especially enthralling because at last we have found the site of the Roman colony (see www.Butrintfound.dial.pipex.com). Previous excavations had concentrated on uncovering the classical Greek city: but where was the Roman colony? We found it on the flat land on the other side of the river: a five hundred metre assessment

trench along a drainage ditch has enabled us to revise the chronology. Julius Caesar harboured his ships here in his campaign against Pompey, and aimed to establish a colony. His death, however, and lobbying by Atticus, a local landlord, delayed the transformation of this idyllic Republic sanctuary into a city until Augustus vanquished Mark Anthony at Actium. Augustus then established a colony at Butrint, settling veterans and slighting Corfu as he did. We believe we have found an exquisitely made altar belonging to the new town, a modest parallel to the discoveries found down the coast at Nikopolis (in northern Greece) where Konstantinos Zachos has been uncovering the Actium monument (soon to be described in a two-day conference at the British Museum, 14–16 November 2003).

The new results at Butrint are some compensation for the grinding daily trials of living in Albania, and in particular the aggressive attitude of the Ministry of Culture, which decided, for reasons best known to itself, to make the

Butrint lies in the wooded hill in the centre. The Greek sanctuary occupied the hilltop and south-facing slope, concealed by trees. The Roman colony lay on the fertile plain to the right of the hill.



Richard Hodges is Director of the World Archaeology Institute at the University of East Anglia.

conservation of our excavations a high profile political issue. Juggling these different commitments to politicians and our sponsors, as well as to our archaeological collaborators and students, certainly stretched our energies as the afternoon temperatures reached 42 celsius. The meltem wind in Athens was a pleasant release; the lower Black Sea temperatures at Chersoneses were pure balm.

Chersoneses lies in the suburbs of Sebastopol, home until recently of the Soviet navy (see www.chersoneses.org). Since Bolshevik times it has been a closed city, limiting the extent of development in its Chora, the agricultural territory around it. Indeed, although more than a century of excavations have concentrated on the town, a Greek colony originally founded in the fifth-century, yet for Joe Carter, an archaeologist from Austin, Texas, the greatest asset is the Chora where the farms, holloway-tracks and walls for viticulture can be seen on the ground. For over ten years, Carter has mapped this agricultural hinterland, helped by the fact that Sebastopol, as the home of the Soviet navy, is one of those few places on the planet that has been photographed by satellites every day since the technology was invented. He has been able to compare the result of his mapping with the work he has done at Metaponto, the Greek colony in the heel of Italy where he has been working for thirty years. Chersoneses, however, is unlike Metaponto, for whereas Metaponto was in decline by the end of the Roman period, Chersoneses continued to thrive as a Byzantine and Medieval Black Sea port.

Preserving Chersoneses presents a very different challenge to our problems at Butrint. At Butrint we have been faced with an awesome political challenge to sustain the surroundings as a National Park in the face of mafia-led developers. The Preserve at Chersoneses faces an altogether different challenge. Well established with two Soviet style museums, a library, an archive and basement stores (the PHI has sponsored a new laboratory/store), the Preserve, being a tract of coastline in the suburbs of Sebastopol, attracts thousands of impoverished Ukrainians every day. From dawn to dusk they were queueing to pay a small fee to cross the site, ring the memorial bell, be photographed by the reconstructed Byzantine church and then to lie on a miniscule Black Sea beach.

Henry Cleere, who is a staff member of the project, and I debated good-humoredly about this. Henry, an ex-member of Icomos, is attempting to get World Heritage status for Chersoneses and the Chora. It certainly merits it. But I feared UNESCO restrictions upon these impoverished but gentle people, respectful of the archaeology. (Late afternoon, the museum was packed with bathers returning homewards....) Unlike Albania, always on the edge of anarchy – where rubbish defiles most places, the Ukraine has a Soviet order and cleanliness. The two could not be more different.

Henry's point, though, has greater substance in the Chora where new residential blocks on the coast and modest summer houses in the landscape are obliterating this unique fossilised



landscape. Yet again, though, there are older Soviet trained archaeologists and conservators who, with pitiful resources, have maintained a tradition that in Albania has virtually disappeared. In Albania foreign teams have re-ignited archaeology, training young Albanians; in the Ukraine, nurtured in this special case by Joe Carter with PHI funding, Ukrainians (or as they pointedly told me – Russians) are taking charge of their archaeological destiny.

As Neal Ascherson illustrated in his thoughtful book on the Black Sea (1995), the archaeological riches of this region are tied to its epic history. The valley in which the 600 members of the Light Brigade charged is still there; Lighthouse Point where a German army fought in vain to evade capture in 1944 is littered with shrapnel (Joe Carter excavated one of the unlucky ones, a German who died behind a Crimean War wall in a Byzantine fortress reusing a Hellenistic farm). Faced with this sweeping history, issues of identity, ownership and, of course, conservation and presentation are matters of daily debate. This puts archaeology where it should be – at the heart of modern culture. For the people of Albania and the Ukraine, the archaeology of Butrint and Chersoneses matters.

The Greek town colony of Tauric Chersoneses has been extensively excavated by Russian archaeologists. At the centre, the refurbished basilica (church) can be seen. The beaches are crowded with holiday-makers. The Russian naval base at Sebastopol is off the picture at the top.

Further Details

Butrint can be visited comparatively easily by ferry from Corfu to Saranda in Albania. An article on the excavations is being prepared for one of the next issues of CWA.

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