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In the last editorial I highlighted the interplay between humans and the role of the environment as a common thread running through the splendid range of articles in Minerva. Curiously, in this issue many of the topics covered have a common theme of a different nature – a component of equal importance that has enabled our species to progress since the production of the first stone tools 2.5 million years ago: technology.

In the Western world we look to ancient Greece as the cradle of our modern civilisation, which gave birth to a sophisticated architecture, arts, democratic government, law, literature and learning, not least philosophy. Plato derided the rowers who manned the trireme, the technological advance that shaped the Athenian state, while his mentor Socrates observed the perfect human form in the athlete Charmides – a physique that came to epitomise the ideal in Greek sculpture.

An independent artistic current flourished in the ancient American civilisations. The beautifully crafted ceramics of the Maya and the opulent gold of the Inca were made possible by technological advances in craftsmanship. The relationship between Egyptology and technology has ushered in further innovations in scholarship and technical advances. This is especially true in the study of Egyptian sites, which was greatly assisted by the development of photography, and the extraordinary DNA analysis of mummified remains, which has the potential to offer information about many facets of Pharaonic life, not least genealogy.

Archaeological survey, too, has benefited from recent technological progress, with the enlightening aerial surveys of Jordan a prime example. If anatomically modern humans reached their maturity with the technological revolution of the Upper Palaeolithic, this very dynamic has paved the way to a world that will continue to change as this interplay progresses.

Dr Mark Merrony

Since the dawn of time, humanity has undergone a series of technological advances that express themselves in the archaeological record. Today, technology allows archaeological enquiry to an unprecedented extent.

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Wrest Park altars p.20

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Picturing the past p.24

Elena Taraskina

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River of memory p.28
Researchers on Crete have uncovered evidence suggesting that early humans, or even earlier hominids, have had a much longer history of seafaring than was previously believed. Over the past two years, archaeologists working on the island have found stone tools which are considered strong evidence of the earliest known voyaging in the Mediterranean.

 Artefact discoveries have provided evidence that humans reached Cyprus, many other Greek islands and possibly Sardinia, no earlier than 10,000 to 12,000 years ago. However, Crete has been an island for more than five million years, so the anatomically modern humans – or possibly earlier hominids such as *Homo erectus* or *Homo heidelbergensis* – who left these stone tools, which archaeologists believe to be at least 130,000 years old, must have arrived there by boat. This pushes back the history of Mediterranean seafaring by more than 100,000 years.

More than 2000 stone artefacts, including hand axes, were collected on the southwestern shore of Crete, near the town of Plakias, by a team led by Thomas F. Strasser, Associate Professor of Art History at Providence College in Rhode Island, together with Eleni Panagopoulou of the Greek Ministry of Culture.

The tools resemble artefacts from the stone technology known as Acheulean, which originated with *Homo erectus* populations in Africa. These distinctive oval and pear-shaped hand axes have been found over a wide area, evidence that Acheulean tool users were the first to leave Africa and successfully colonise Eurasia. Th ese tools could be as much as 700,000 years old. Th e standard hypothesis has been that Acheulean toolmakers reached Europe and Asia via the Middle East, passing mainly through what is now Turkey into the Balkans. Th ese new finds suggest that they did not only travel by land.

It has been established that the earliest maritime travel was the sea crossing of early humans to Australia, which began about 60,000 years ago. Th ere is also some evidence of early hominids travelling by water to new habitats, particularly the Indonesian island of Flores, where skeletons and artefacts associated with so-called ‘hobbits’ have been found. Th e research from Crete, if confirmed by further study, could provide an entirely new timeline of human and hominin mobility.

Sophie Mackenzie

Ancient mariners on Crete?

Accessing the Tombs of Jebel Hafit

In the south-east of the United Arab Emirates, near the city of Al Ain, stands Jebel Hafit, a mountain that rises more than 1200m above sea level and straddles the border between the UAE and Oman. Th e mountain also lends its name to the early Bronze Age tombs that have been found on the northern and eastern slopes. More than 500 of these beehive-shaped tombs have been found in the area, the largest of which originally stood 4m in height. Dating to c. 3200 - 2700 BC, the Hafit Tombs were constructed from locally quarried stone.

Th e tombs had been stripped almost bare by millennia of looting, and, until scientific testing is carried out on the small number of human skeletal remains found within a few of the tombs, it cannot be confirmed if the bones belong to those originally buried in the tombs or are those of peoples who reused the structures during later periods. Finds of polychrome pottery discovered in some of the tombs indicate that the tomb builders had links with the wider Middle East with the pottery produced at Jemdet Nasr near ancient Babylon between c.3200-2900 BC, and therefore suggest trading contacts that connected Arabia and southern Mesopotamia during the early Bronze Age.

Dr Al Naboodah, Professor at United Arab Emirates University, Al Ain, says that, during the Early Bronze Age: ‘Th e area was… a bustling farmland on the route of a caravan. So it is very likely there were immigrants and influences from Mesopotamia and the ancient Egyptians that introduced different kinds of gods and deities as well as religious rituals that spread throughout the Arabian Peninsula.’

Until very recently this region was a military-controlled area, strewn with landmines and inaccessible to both archaeologists and interested tourists. However, in preparation for the building of a new resort complex, the mines and other military ordnance has been cleared away and, with the help of a 4x4 off-road vehicle, visitors can now access the site. Although the majority of the tombs located on the northern side of Jebel Hafit have been destroyed by recent construction, the structures that survive on the eastern flanks of the mountain are now protected by the Department of Antiquities and Tourism, while some of the tombs have also been undergoing a process of restoration.

Benazir Siddique

London School of Economics and Politics, Dubai

The coast of Crete near Plakias, where the tools were found. Photo courtesy of Silvain de Munck.
A new non-destructive method of radiocarbon dating

At the 239th National Meeting of the American Chemical Society, held in San Francisco from 21-25 March, research into a new form of radiocarbon dating has been revealed. The technique offers the potential to revolutionise our ability to assign extremely accurate dates to archaeological artefacts.

Since being developed by Dr Willard Libby in 1949, radiocarbon dating has been one of the most useful scientific tools available to archaeologists, allowing organic material to be dated by determining its content of carbon 14 (C\(^{14}\)). However, the method of testing has always necessitated the destruction of the material undergoing study. Although today only tiny samples are required in order to test the age of an object, any destruction of archaeological treasures.

By contrast, the new dating method removes the need for the sample material to undergo destructive acid-base washes and incineration. Instead the entire object is placed in a special chamber filled with electrically charged gas, a plasma that gently oxidises the surface of the artefact to produce carbon dioxide for C\(^{14}\) analysis.

The research was led by Prof Marvin Rowe from Texas A&M University, College Station, who, with a research team from a branch of the university based in Qatar, developed the new dating method. According to Prof Rowe, ‘This technique stands to revolutionise radiocarbon dating. It expands the possibility for analysing extensive museum collections that have previously been off limits because of their rarity or intrinsic value and the destructive nature of the current method of radiocarbon dating.’

Rowe and the other researchers have used the new dating method to obtain the age of about 20 different artefacts, including a section from a medieval Egyptian textile. In every case, the results obtained from the new non-destructive dating technique match those derived from the conventional C\(^{14}\) sampling method.

Even before the conference in San Francisco had come to an end, there was speculation that the new technique could be used to date the Turin Shroud, the most famous and controversial artefact ever to have been radiocarbon dated. Prof Rowe noted that, in theory, it could be used for this purpose. The linen cloth, believed by the Roman Catholic Church to be the burial shroud of Jesus Christ, underwent C\(^{14}\) dating in 1988, when three separate laboratories reached the conclusion that the shroud was a medieval fake produced between AD 1260 - 1390. The results of the tests carried out 22 years ago have, however, been questioned by some scholars, who argue that the material was taken from a medieval patch sewn on to the much earlier shroud. The new dating technique offers the possibility of re-testing the shroud, and indeed a great many other precious artefacts, so as to provide a definitive date and finally bring an end to the speculation regarding this and other archaeological objects.

James Beresford

Domus Aurea damage

On 30 March, firefighters were called to the Golden House of Nero, the Domus Aurea, after the ceiling suffered partial collapse. The Domus Aurea gained its name from the extensive use of gold-leaf in the decoration of the palace. As well as frescoes painted on the walls, the walls and ceilings were also adorned with panels of ivory and semi-precious stones.

Construction of the palace began on the slopes of the Esquiline Hill following the Great Fire which swept through Rome in AD 64, and the building was completed four years later, just before Nero’s death. Although most of the 80 hectare site was soon dismantled by Vespasian, about 150 rooms survived.

The Golden House has been one of the most popular tourist attractions in Rome since it was reopened in 1999. However, the palace was closed throughout most of the 1980s and 1990s because of concerns over the safety of the structure. Since its reopening, it has continued to be prone to closure, with structural problems and water infiltration, with a section of the ceiling collapsing in 2001.

James Beresford

Claims of infant sacrifice in ancient

A study led by University of Pittsburgh researchers could finally lay to rest the conjecture that the ancient empire of Carthage regularly sacrificed its youngest citizens. An examination of the remains of Carthaginian children revealed that most infants perished prematurely or very shortly after birth and were unlikely to have lived long enough to be sacrificed, according to a report in the online journal PLoS ONE.

The findings, based on analysis of skeletal remains found in Carthaginian burial urns, refute claims from as early as the 3rd century BC of systematic infant sacrifice at Carthage, according to lead researcher Jeffrey H. Schwartz, a Professor at Pitt’s School of Arts and Sciences. Prof Schwartz and his colleagues present the more benign interpretation that very young Punic children were cremated and interred in burial urns regardless of how they died.

Writing in the 1st century BC, the Greek historian Diodorus Siculus wrote of how, ‘In former times they [Carthaginians] had been accustomed to sacrifice… the noblest of their sons, but more recently, secretly buying and nurturing children, they had sent these to the sacrifice’ (Library of History, 20.14). However, according to Prof Schwartz, ‘Our study emphasises that historical scientists must consider all evidence when deciphering ancient societal behaviour. The idea of infant sacrifice in Carthage is not based on a study of cremated remains, but on instances of human sacrifice reported by a few ancient chroniclers, inferred from ambiguous inscriptions, and referenced in the Old Testament. Our results show that some
Art is a very useful index of the spread of mythology and artistic taste in the Roman Empire. This is especially true of Medusa, one of the three gorgon sisters, who had snakes for hair and – according to Graeco-Roman myth – could turn those who looked at her into stone.

Medusa is depicted in stone as the centrepiece of a new open-air exhibition in northern Israel, ‘Medusas in Caesarea Harbour’.

Medusa was a common motif in Roman art, appearing on bronzes, floor mosaics, architectural sculpture, and military paraphernalia – the Gorgoneion – to ward off evil and enemies. This fine example, dating to the 3rd century AD, also contains motifs of theatrical masks – perhaps intended to entertain in the afterlife – and was recovered in the course of extensive excavations conducted in a necropolis adjacent to the ancient city. It weighs a staggering four tonnes. Sarcophagi of this character were unique to elite members of society, and it may have contained the remains of a local official, a female aristocrat, or a member of the priesthood. The ethnicity of the sarcophagus’s occupant is unclear, but because the originally pagan practice of interment in sarcophagi later spread to all religions in the region, he or she could have been pagan, Jewish, Samaritan, or even Christian.

Caesarea emerged as a flourishing Hellenised urban centre from 22 BC onwards under Herod the Great, who dedicated the former city of Straton’s Tower to his great patron Augustus (r. 27 BC – AD 14). The city was capital of Judea and of the province of Palaestina Prima after the reforms of Diocletian (r. AD 284 - 305). Other finds displayed in the current exhibition include a piece of building fabric with a dedicatory inscription by a female named Cleopatra, and a sarcophagus with an inscription dedicated by Eliphis to his wife Manophila. Dedication inscriptions of this character are commonly found in the Romano-Byzantine Levant and provide an informative index of family ties and patronage. This is the first of several planned exhibitions in the harbour compound at Caesarea.

Dr Mark Merrony

The Medusa in Caesarea

Schwartz and Houghton then selected teeth from 50 individuals they concluded had died before or shortly after birth, and examined these for a neonatal line. This opaque band forms in human teeth between the interruption of enamel production at birth and its resumption within two weeks of life, and is used to determine an infant’s age at death. A neonatal line was present in the teeth of 24 individuals, meaning the others had died prenatally or within two weeks of birth.

The contents of the urns also dispel the possibility of mass infant sacrifice, as none contained enough skeletal material to suggest the presence of more than two complete individuals. Although many urns contained some superfluous fragments belonging to additional children, the researchers concluded that these bones remained from previous cremations.

The team’s report also disputes the contention that Carthaginians specifically sacrificed first-born males. Schwartz and Houghton determined sex by measuring the sciatic notch (a crevice at the rear of the pelvis that is wider in females) of 70 hip bones. They discovered that 38 pelvises came from females and 26 from males. Two others were likely to be female, one probably male, and three undetermined.

Schwartz and his colleagues conclude that the high incidence of prenatal and infant mortality are consistent with modern data on stillbirths, miscarriages and infant death. If conditions in other ancient cities were comparable with Carthage, young and unborn children could have easily succumbed to the diseases and sanitary shortcomings found in such cities as Rome and Pompeii.

Sophie Mackenzie

Carthage debunked

Sophie Mackenzie
Minerva May/June 2010
The ‘golden bough’ is found in Italy

Italian archaeologists claim to have found a stone enclosure that once protected the legendary ‘golden bough’. The discovery was made whilst excavating a sanctuary in the Alban hills north of Rome, by a team led by Filippo Coarelli, a recently retired Professor of archaeology at Perugia University. The researchers believe that the enclosure was built by the Latins to protect a large cypress or oak tree. The stone enclosure is in the middle of an area that contains the ruins of an immense sanctuary dedicated to Diana, the goddess of hunting. Finds of pottery fragments dating to the 13th or 12th centuries BC indicate that the site was in use during the mid or late Italian Bronze Age.

Prof Christopher Smith, the head of the British School at Rome, commented: ‘It’s an intriguing discovery and adds evidence to the fact that this was an extraordinarily important sanctuary.’

In the Aeneid, Virgil tells of the Trojan hero Aeneas’ journey to the underworld. Anchises, Aeneas’ dead father, appears to his son to tell him to visit the underworld, where he will learn what the future holds for his people. Aeneas must first find the oracle Sibyl of Cumae, who will lead him to the land of the dead – but she informs him that he cannot pass through the underworld without the golden bough. Two doves lead him through the forest to an oak tree bearing a sacred branch, and he and the Sibyl enter the underworld together. The bough allows the hero to pass safely through various hazards, and be taken by the boatman Charon across River Acheron to the kingdom of Hades. There he finds the spirit of his father.

The sacred oak branch described in the Aeneas myth also gives its name to The Golden Bough, a highly influential study of myth and religion published in 1890 by Sir James Frazer (1854-1941).

Sophie Mackenzie

Cambridge cast gallery reopens

The Museum of Classical Archaeology at Cambridge reopened to the public in April. With more than 600 plaster casts of Graeco-Roman sculpture, of which 450 are on display, the collection is one of the largest of ancient statuary in the world. First opened in 1884, the museum provides an invaluable resource for students from Cambridge University, specialists and the public. Although none of the works of art on show are original, all the sculptures, reliefs, vases, and shards of pottery are accurate replicas cast from the originals, allowing most of the great sculptures created during antiquity to be viewed together in a single location.

The collection is important not only as a teaching tool, but because it preserves the form of artworks that have subsequently been destroyed or damaged. For example, the Lysicrates Monument in Athens, built in 334 BC, has become gravely eroded as a result of the city’s air pollution over the past century. The museum’s copy, cast in the 18th century, preserves some of the figures that have been worn away from the late Classical monument, allowing researchers a better understanding of the monument than from study of the original.

One of the most famous casts in the museum is that of the Peplos Kore. While the original statue, carved from white Parian marble, stands in the recently opened Acropolis Museum in Athens (see Minerva, November/December 2009, pp. 8-11), the cast at Cambridge is presented in the vibrant colours that were painted on the statue when it was first erected on the Athenian Acropolis in c. 530 BC. The cast therefore provides a good impression of how the sculpture was originally intended to be viewed when it was created during the Archaic period.

The reproductions in the museum also allow sections of statues that have become broken and separated over the years to be reunited. A plaster cast of another Archaic kore from the Acropolis of Athens – known as the Lyon kore because the upper body and head are in the French city – is reunited in cast form at Cambridge with the other surviving pieces of the statue, which are currently on display in the Greek capital.

The Museum of Classical Art is housed in the Classics Faculty building on Sidgwick Avenue, Cambridge. Entrance to the museum is free.

For further information about the museum, and access to the online database of the collection of casts, visit http://www.classics.cam.ac.uk/museum/.

James Beresford
Roman aqueduct unearthed in Jerusalem

A team of archaeologists has recently identified a large section of the high-level aqueduct system that supplied the Roman city of Jerusalem. The find was made under the direction of Dr Ofer Sion as part of an excavation conducted under the auspices of the Israel Antiquities Authority (IAA) in the area inside the Jaffa Gate in the west of the Old City.

The section of aqueduct is 1.5m above the original ground level, with an internal conduit width of 60cm, and is preserved for 40m in length with inspection shafts placed at 15m intervals – a characteristic of many Roman aqueducts for purposes of maintenance (often to clear limescale, known as sinter in civil engineering terms).

Sion and his colleagues have confirmed that this section of aqueduct corresponds to the water conduit identified by German architect, archaeologist and Protestant missionary Dr Conrad Schick in advance of construction work in 1898. Originally, the channel formed part of the high-level aqueduct system that supplied water to the Palace of King Herod and the Pool of Hezekiah. The low-level aqueduct fed water to the area of the Second Temple and supplied the Pools of Bethesda and Siloam – now attested archaeologically – where Jesus is known to have carried out his healings in the days prior to the Crucifixion (see Minerva, July/August 2009, pp. 19-23).

It has been ascertained that the high-level channel was part of the new system supplying the city rebuilt by Hadrian (r. AD 117-138) as Aelia Capitolina after it was razed in the Bar Kokhba Revolt of AD 135. Both branches of the system were supplied by Solomon’s Pools, three impressive cisterns located 5km south-west of Bethlehem – incorrectly named after the biblical king. These had a combined capacity of an estimated 200 million litres and were supplied by a series of underground springs. The cisterns were configured as a cascade system, with a height differential of 6m, and were fed by a rock-cut tunnel and connected to the Jerusalem supply lines in the same manner. Collectively, this ingenious system represents yet another magnificent achievement of Roman civil engineering.

Dr Mark Merrony

EGYPT NEWS

Discovery of the remains of Queen Behenu’s pyramid at Saqqara

French archaeologists excavating at Saqqara, in the necropolis of the 6th dynasty pharaoh Pepi I (reigned c. 2332 - 2283 BC) have discovered the tomb of queen Behenu, containing an intact sarcophagus within. Although it has not yet been confirmed, it is thought Behenu was one of several wives of Pepi II (reigned c. 2278 - 2184 BC), who, on succeeding Merenre (c. 2283 - 2278 BC) to the throne as an infant, is recorded as reigning for 94 years, the longest of any pharaoh.

Also discovered by the archaeologists were the broken and scattered remains of Pyramid Texts belonging to the Queen. These focused on rituals concerning the resurrection and afterlife. Only 11 other tombs have been found containing these texts, the earliest religious writing in Egypt. The importance of the Pyramid Texts was stressed by Philippe Collombert, who heads the mission sponsored by the French Ministry of Foreign Affairs: ‘Pyramid Texts are the first compass of writing in the world. This is the very first huge grouping of text in the history of the world. That’s why it’s so important to find these Pyramid Texts, even if they’re the same as those found in other pyramids. Sometimes one sentence will change and some new words and sentences will appear with formulas for the afterlife.’

Unfortunately, Behenu’s pyramid, like most of the others located at the necropolis, was heavily damaged during the Mamluk period (c. AD 1250 - 1517), when the limestone casings were removed and stone was quarried from the funerary chambers, often leaving little more than a mound of rubble for archaeologists to investigate.

Funerary temple statues discovered at Kom el-Hettan

It was announced in late March that two statues had been discovered during routine work being carried out to reduce groundwater levels close to the funerary temple of Amenhotep III (reigned c. 1386 -1349 BC) at Kom el-Hettan on the west bank of the Nile near Luxor. Both statues were carved from red granite, the first depicting Amenhotep together with the god Re-Horakhty, while the second is of the god of wisdom, Thoth, shown with the head of a baboon. A large fragment of a statue carved from calcite was also unearthed during the maintenance work, and has also been tentatively identified as dating to the reign of Amenhotep III. Excavations in the area around Kom el-Hettan will remain in progress in the hope of recovering additional statues that were once placed within the funerary temple.

Registering Egypt’s privately owned antiquities

In order to meet new government regulations concerning the ownership of antiquities by Egyptians (see Minerva, March/April, p.7), on 10 March the country’s Culture Minister announced the setting up of a committee that will inspect and register any privately owned artefacts. Under the terms of the new legislation, which was brought into effect at the start of February to reinforce the country’s ban on the trade in antiquities, Egyptians who possess historic artefacts must register them with the committee, which is affiliated to the Supreme Council of Antiquities. James Beresford
Tutankhamun was a club-footed, inbred teenager with a cleft palate, who probably died as a result of an infection from a broken leg and complications resulting from malaria. These are just some of the long-awaited findings of a study undertaken in Egypt over the last two years. Using the latest scientific procedures, the objective of the study was first to discover the much-debated reasons behind the early death of the young pharaoh, and allowed the researchers to trace the genealogy of many members of the 18th dynasty, resulting in the production of a family tree for Tutankhamun that spanned five generations.

That such an invasive procedure required to retrieve the DNA was carried out all is remarkable. Dr Hawass himself has long been adamant that such examinations should not be inflicted on Egyptian mummies because DNA would not have survived the mummification process or the heat and humidity of thousands of years in an Egyptian tomb. A scientific paper published in the American Journal of Physical Anthropology in 2005 also summed up research into the viability of DNA survival in ancient Egyptian mummies: ‘To conclude, we find that the thermal history of most, if not all, ancient Egyptian material argues against the recovery of DNA. Consequently, such claims should continue to be considered skeptically.’

What may have helped persuade Dr Hawass and the SCA to undertake the recent research was funding from the Discovery Channel (which also gained filming rights for the research), allowing the equipping of a new DNA laboratory at the Egyptian Museum in Cairo. The establishment of this new laboratory alongside the one at the National Research Center in Cairo meant that DNA testing could be carried out independently at different locations in the Egyptian capital without the need to involve any foreign institutions, a source of great pride for the Egyptian scientists.

More importantly, the use of two separate laboratories eliminated any possibility of contamination of the ancient DNA by the research staff affecting the final results. According to the report in the JAMA, ‘because the [genetic] profile differed from those of the control group [of mummies] the data were considered authentic’. The fact the DNA was extracted from the bone also offered a greater chance that the samples would be free from contamination. Nevertheless, the long years in which the mummies have been poked, prodded, and sweated over by Egyptologists makes it difficult to rule out the possibility that modern DNA has permeated into the bone, corrupting the tests and leading to distorted results.

Despite such concerns, the results from the DNA tests offer the chance to closely map Tutankhamun’s immediate family tree. It is his critics, the new research has offered some extremely interesting findings that will be scrutinised by scientists long into the future.

In addition to Tutankhamun, ten other royal mummies, known or believed to have been closely related to the young pharaoh, were also examined. The remains of an additional five mummies dating to the early New Kingdom were also included in the study to act as a control group. All 16 mummies were subjected to detailed study, with the results released in the Journal of the American Medical Association (JAMA) in February, while the leader of the research team, Dr Zahi Hawass, Secretary-General of Egypt’s Supreme Council of Antiquities (SCA), also presented some of the more sensational results of the two-year study during a press conference.

Using a Computed Tomography (CT) unit, 12 of the mummies held at Cairo Museum were scanned, as were those of Tutankhamun and two other bodies recovered from tomb KV35 in Luxor. (The only mummy not scanned was that of Ahmose-Nefertari, wife of pharaoh Ahmose I, c.1550-1525 BC.)

Alongside this, microsatellites were examined; these repeated sequences of DNA acted as ‘genetic fingerprints’ and allowed the researchers to trace the genealogy of many members of the 18th dynasty, resulting in the production of a family tree for Tutankhamun that spanned five generations.

Despite such concerns, the new research has offered some extremely interesting findings that will be scrutinised by scientists long into the future.
Amhotep III. ’KV55 mummy to Akhenaten’s father
lineage. Perhaps the most momentous announcement of the entire project was that the DNA fingerprinting has allowed the researchers to conclude that the father of the boy king was the unidentified mummy found in tomb KV55, and that the poorly preserved body is probably that of the infamous heretic pharaoh, Akhenaten (Figs 4, 5). As Dr Hawass noted: ‘The analysis proves conclusively that Tutankhamun’s father was the mummy found in KV55. The project’s CT scan proves that this mummy provides an age at death of between 45 and 55 for this mummy. Most earlier forensic studies had put forth an age of 20-25, which would be too young for Akhenaten, who came to the throne as an adult and ruled for 17 years. The new CT scan proves that this mummy is almost certainly Akhenaten himself. The DNA also traces a direct line from Tutankhamun through the KV55 mummy to Akhenaten’s father Amenhotep III.

Tomb KV55 – its entrance lying barely a dozen metres from the opening to Tutankhamun’s tomb of KV62, – was found in 1907 by Edward Ayrton (Fig 6). Inside, both the walls of the tomb and the mummy itself were badly damaged by water seepage, and identifying the body had been impossible because all the cartouches on the coffin had been obliterated. Originally thought to have been the body of Queen Tiye, the mummy was later identified as male and, until the latest research, had generally been linked to that of Smenkhkare, the little-known pharaoh who seems to have briefly succeeded to the throne on the death of Akhenaten.

If the KV55 mummy is indeed that of Akhenaten, then the body of the most controversial pharaoh ever to rule Egypt has finally been identified. This will put an end to years of speculation surrounding the final resting place of a king whose theological focus on a single god, the Aten – the worship of which was centered on the newly created city at Amarna (Fig 3) – was a radical departure from the traditional pantheon of deities controlled by the powerful priesthood in Thebes.

The DNA testing also indicated that Tutankhamun’s mother was probably the ‘Younger Lady’ found in tomb KV35, and that she was of royal blood, probably the daughter of Amenhotep III and Queen Tiye. It would therefore appear that she was full sister as well as wife to Akhenaten. If this is confirmed, then Tutankhamun’s family tree was extremely well pruned, a fact noted by Dr Hawass during his press conference: ‘Tut’s only grand-parents, on both his paternal and maternal sides, were Amenhotep III and Tiye.’

Such inbreeding may also explain the two stillborn foetuses discovered in Tutankhamun’s tomb by Howard Carter in 1922. Their mummified remains were among those included in the recent research study and indicate that they were children of Tutankhamun, while their mother was probably the previously unidentified mummy found in KV21 in 1817. If this assumption is correct, then this is almost certainly the body of Ankhesenamen, the queen and only known wife of Tutankhamun (Fig 7). Ankhesenamen may have been a half-sister of Tutankhamun, further ‘evidence’ of the inbred nature of Egypt’s 18th dynasty, and possibly a major reason for the stillbirth of the two foetuses.

However, if the research team are correct in identifying Ankhesenamen and Tutankhamun as the parents of the two foetuses, then the DNA results raise new problems. The genetic fingerprinting indicates that if the KV21 mummy is indeed Tutankhamun’s queen Ankhesenamen, then the DNA taken from the remains of the two foetuses appears to show that the mummy in KV55, identified as Akhenaten, was not their maternal grandfather. If this is correct, then either Ankhesenamen was not the mother of the stillborn babies in his tomb, or she was not the daughter of Akhenaten and his beautiful wife Nefertiti (Fig 8), despite the strong historical evidence in support of this being Ankhesenamen’s parentage.

Instead of identifying the mummy from KV55 as that of Akhenaten, there is a possibly that it is, as originally thought, the body of the enigmatic pharaoh Smenkhkare. If this is the case, then the DNA would seem to prove that Smenkhkare was the father of Tutankhamun, and, like Akhenaten, he was a son of Amenhotep III. However, given the inbreeding and incestuous nature of 18th dynasty marriages, as
well as the limited historical sources that survive from this period, constructing a family tree deciphering the genetic data remains exceptionally difficult and will no doubt remain contentious well into the future.

Akhenaten and other royalty of the Amarna period, including Tutankhamun, are often depicted with a strange and somewhat feminised physique (Figs 5, 7). This has led to speculation that male members of the royal family had a form of gyneacostasia which saw them develop abnormally large mammary glands resulting in enlarged, female-like breasts. Scholars have also theorised that Akhenaten and Tutankhamun suffered from Marfan syndrome, a hereditary genetic disorder that will often cause elongated, slender arms and legs, and can produce other skeletal problems such as curvature of the spine (scoliosis). Sufferers will sometimes also have either an abnormally hollowed chest or, conversely, an abnormally protruding sternum. Such disorders have therefore been readily equated with many of the highly unusual physical features with which Akhenaten is portrayed.

Unfortunately, even if the recent study published in the JAMA is correct in assuming that the KV55 mummy is Akhenaten, the poorly preserved skeletal remains make identifying physiological characteristics impossible. Similarly, because the front of Tutankhamun’s chest wall is missing, and his pelvic bones have also been removed, it is impossible to detect any traits associated with gynaeacostasia or Marfan syndrome from either of the mummies. The researchers did carry out tests for dolichocephaly, which sometimes results from Marfan syndrome and can cause the premature fusion of the sagittal suture on top of the skull, leading to the head becoming disproportionately long and narrow. This is reflected in the art of Amarna, in which the heads of Akhenaten and other royal members appear very elongated. However, the researchers also measured the shape of both mummy skulls and found that, rather than being abnormally long-headed (dolichocephalic) both were in fact short-headed (brachycephalic). After testing all the mummies associated with the 18th dynasty, the report in the JAMA emphasises that ‘a Marfan diagnosis cannot be supported in these mummies’.

The research did, however, reveal that Tutankhamun suffered from a bone disorder known as Köhler disease, which inhibits the flow of blood to the feet. It was stressed by Dr Hawass during his press conference that: ‘The CT scan also revealed that the king had a lame foot, caused by avascular bone necrosis. This conclusion is supported Egyptologically by the presence of over one hundred walking sticks in the tomb and by images of the king performing activities such as hunting while seated.’ Some scholars have claimed that the published images of the recent scans do not clearly lead to a diagnosis of a loss of blood flow (osteonecrosis) to two of the metatarsal bones of Tutankhamun’s left foot. Instead it has been suggested the deformities in the young pharaoh’s foot may be the result of the embalming and mummification process. However, the reported signs of new bone growth in the foot as a reaction to the necrosis would appear to confirm that Tutankhamun suffered from osteonecrosis and had a lame foot. This disability may also explain the fracture in Tutankhamun’s left thigh – unhealed at the time of his death – which was discovered during a previous examination of the king’s body, a breakage that may have been the result of the pharaoh suffering a heavy fall through being unable to walk properly on his lame leg. While Dr Hawass may be correct in regarding the presence of 131 walking sticks in Tutankhamun’s tomb as a reflection of the pharaoh’s club foot, it is also possible that the canes primarily fulfilled ceremonial and symbolic rather than medical functions.

The researchers concluded that the osteonecrosis of Tutankhamun’s left foot and the fracture of his thigh, in combination with malarial infection, probably lead to the pharaoh’s early death. The DNA results certainly prove that Tutankhamun, together with three of the other mummies tested, was infected with the Plasmodium falciparum malaria parasite. This may have led to a weakening of the pharaoh’s health and contributed to his early death. The malarial infection also possibly explains the presence of medicinal seeds, leaves, and fruits found in Tutankhamun’s tomb. However, other experts are cautious of attributing the young king’s death to malaria since many people living in malarious regions contract the disease in childhood but gain partial immunity in later life. While Tutankhamun’s DNA appears to show that he suffered from malaria, there is no definitive proof that the disease was the cause of his death. Malaria had already been detected in Egyptian mummies thought to be older than those of the 18th dynasty. However, the recent research is interesting in that none of the mummies had tuberculosis, leprosy, bubonic plague, or many of the other diseases that have troubled human populations in later periods of history.
T
he classical conception of the human form is often misunderstood in modern culture. When the phrase 'a body like a Greek god' is used, it often simply refers to musculature. This was clearly part of the equation, but the Greek ideal of human perfection goes beyond muscular development. Modern bodybuilders, for instance, would probably not have been considered beautiful in ancient Greece. On a physical level, the male athlete should have a body with certain proportions. The shoulders should be larger than the waist; the arms, neck, and calves of similar size. Bulging muscles would not be desired. Perhaps the toned bodies of modern swimmers come closest to the ideal. As with so many other aspects of culture, conceptions of beauty were also bound up with social mores. Then, as now, the majority of the population idolised successful athletes. However, the elite of ancient Greece had a distinctive set of rules for determining what constituted perfection.

With *The Greek Body*, Ian Jenkins and Victoria Turner have written a book that covers this subject, based upon the comprehensive collections of the British Museum. Such a thematic volume should provide inspiration to find the pieces that are distributed throughout the collections. Select objects from other museums are also presented to assess the accuracy of Roman copies of Greek originals, as well as to make up for missing originals. For all practical purposes, the book is produced as if it were a catalogue for a major exhibition.

Lying at the most abstract end of scale, representing an early depiction of the human form, the authors have selected a clay ‘plank’ figurine from Cyprus (Fig 6). Dating from the Bronze Age, it demonstrates why artistic expression is linked to technical mastery. The head of the figure is portrayed as a smaller flat rectangle in relation to the body. Facial detail consists of incised lines and small lumps of ears and a projecting nose. The geometric detail on the body probably indicates clothing. The main focus is the crudely modelled arms, which cradle a baby, and there is one exposed breast. It is no surprise that the figure is taken to be connected with fertility. Many of the earliest figurines from Europe are female, which has led a number of scholars to suggest that there was heightened importance given to women at this time. Whatever the case in distant antiquity, by the 5th century BC and the start of the Classical period, particular attention was paid to the male body.

Plato’s dialogue, *Charmides*, describes how Socrates, following his return from military service in 431 BC, went to the wrestling school of Taureas where he saw Charmides, a youth said to be aposopos – so perfect he represented a type and not just an individual. Socrates observed his grace and charm, and saw that the boy did nothing to encourage his admirers, also noting that he had a mentality to match his physical attributes. Socrates was himself a balding, snub-nosed, pug faced and pot bellied follower of Dionysos, but he extolled the cultivation of body as well as mind. The rulers of ancient Greece had long acclaimed these virtues, at least among their youth.

Those from the right families were not encouraged to engage in leisure pursuits, but rather to aspire to arete or excellence. To excel in athletics and public speaking took hard discipline and long training, but being able to serve the city as a politician or a warrior was highly regarded. Then, as now, a life cut short secured fame. Dying in defence of one’s city was considered a beautiful death (*kalos thanatos*). The kouros statues of the 6th century BC represented the ideal of the Greek body for the age (Fig 3). The posture
of their outdoor pursuits, men were usually portrayed as tanned. However, there were exceptions to every rule. The Spartans expected all members of their society to be strong, and outdoor pursuits were encouraged in young women so that they would bear healthy children and raise powerful warriors. Foot-races for girls, held at Olympia in honour of Hera—who covered marriage in her purview—were a time when the female body could be partially exposed. Pausanias, writing in the 2nd century AD, describes the runners at the race at Olympia: ‘...their hair hangs down, a tunic reaches to a little above the knee, and they bare the right shoulder as far as the breast’ (Fig 10).

Classical depictions of goddesses often follow different standards from those of humans. Aphrodite can be portrayed as a relatively demure woman in a cloak with her head covered by a headdress (Fig 4). In contrast, other images can leave little to the imagination, emphasising her attributes as the goddess of love, beauty and sexuality. A well known example, which survives in copies, is by the sculptor Praxiteles (Fig 4). The original lifesized statue, dating to the late 3rd or 2nd century BC in marble or bronze, graced the temple at Knidos in south-western Anatolia. Early generations of art historians regarded the

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**Fig 3. Kourosof Kroisos, National Archaeological Museum of Athens. 530 BC. H. 195cm.**

**Fig 4. Aphrodite of Knidos, 2nd century AD, copy of original of c. 360 BC. Vatican Museums. H. 210cm.**

**Fig 5. Marble kore from Athens, 100-30 BC (copying a much earlier style). H. 56cm.**

**Fig 6. Red polished ware figure of a woman with a child. Cyprus, 1975-1850 BC. H. 26cm.**

**Fig 7. Terracotta group of Aphrodite and Eros, 300-100 BC. Although said to be from Tanagra it is also possible it is from Anatolia. H. 27.5cm.**
Minerva
May/June 2010

Greek sculpture

original as a turning point in Classical sculpture. Before Praxiteles, only male statues were naked, but after his statue was placed in Knidos, a number of sculptors portrayed the goddess nude. Sculptures of this type are in keeping with what is known of the sexual nature of the deity, and possibly also indicate a change in the way women were perceived. Jenkins and Turner note that while this was not the first such nude Aphrodite, it was nonetheless an innovative and extremely lifelike statue. Of all the goddesses, she is the only one who is regularly shown nude in Greek art. However, while masterpieces of this kind could grace elite homes, it is clear that household figurines made of clay in a more conservative style were produced for centuries after the mores of the elite had changed.

Polykleitos of Argos (c. 440-430 BC), was regarded as one of a handful of great sculptors of Classical antiquity. None of his original works survive, although there are a number of Roman copies. One of his best known is the Doryphoros or ‘Spear-carrier’ (Fig 2). The artist pays particular attention to the human form, contrasting stretching and contracting, and tensing and relaxing. Polykleitos wrote a treatise called The Kanon – now lost – which proposed a precise set of measurements that were supposed to define the perfect male body. This was no doubt influenced by other works of the period, specifically those of Pythagoras, who defined perfect intervals in music. Not surprisingly, given that he had a well defined theoretical basis for his art, he attracted followers who also had a great impact upon Classical sculpture.

Myron of Athens (c. mid-5th century BC), also known in ancient Greece as an outstanding sculptor, may have influenced Polykleitos. He is not well represented in literature – the first reference of his name comes from the 3rd century BC – and is best known for his bronzes. His depictions of athletes could be seen at Olympia, Delphi, and no doubt other places as well. Several Roman copies of his Diskobolos exist (Fig 1). The attribution is based upon a description of his sculpture in Lucian (Philopseudes, 18) dating to about AD 160. The pose of the figure is unique, and in this case there appears to be little doubt that the Roman statues are copies of this artist’s work. What

Fig 8. Greek bronze vessel, 2nd-1st century BC. H. 10.2cm.

Fig 9. Bronze statuette of Dionysos, Greek but perhaps made in Taranto, Italy, c. 200 BC. From Chessy, France. H. 21.3cm.

Fig 10. Bronze figure of a running girl, probably made in Laconia, 6th century BC, said to be from Prizren, Kosovo. H. 11cm.

Fig 11. Pentelic marble grave relief, 4th century BC probably from Athens. Head re-cut in the 1st century AD. H. 179cm.

Ancient Greek artists were able to capture the beauty as well as the diversity of everyday life...
is notable is that, unlike other artists from the period, Myron chose to capture a figure in motion. In the copies the athlete has pulled back and is preparing to throw the discus forward. However, as Jenkins and Turner note, it is not an accurate depiction of a throw, but a composition designed to show the ideal of male beauty, intended to be viewed from one angle.

The School of Praxiteles of the 4th century BC continued their quest to naturalise sculpture so that it should more closely imitate the human body. This school had a wide impact on the period, and was known for elongated figures with a proportionate decrease in the size of the head (Fig 13). The torso was also often portrayed with an S-shaped curve. Some scholars even describe his figures as 'lounging.' Figures of this style can be viewed from either side, rather than simply from the front. The face is also typically portrayed in three-quarter view. Jenkins and Turner point out that there is also a softening and blurring of the modelled parts of the torso, and an unusually fine finish that imitates flesh. The products of this school mark a definitive break with the past; the kouros was replaced by a new conception.

Later Greek art could portray a variety of figures. The wine god Dionysos is a good example. Depictions of this deity are, perhaps not surprisingly, fleshy rather than athletic (Fig 9). Pursuit of pleasure has warped the ideal of physical excellence. Many grotesque or comical images were created from lesser materials, such as clay. Depictions of women who show their age, perhaps after careers as prostitutes or slaves, are known (Fig 12). It is hard not to imagine these were intended to be comical, yet they also remind the viewer of everyday life rather than an ideal world. At the same time ancient Greek artists were able to capture the beauty as well as the diversity of everyday life. With the attempted invasions of Greece by the Persians in the early 5th century BC, and the conquests of Alexander the Great from 334-323 BC, there was more interest in peoples from distant lands and more sculptures of foreigners were produced (Fig 8). On one hand, this can be interpreted as a fascination with the exotic; on the other, it is evidence that Greek art, for centuries concerned with expressing a type, was now considering the world as it truly was.

The Romans’ fascination with the Greek world is well known. They were avid collectors of Classical sculptures, through looting, purchase, or the production of copies. Greek sculpture could be used in a variety of ways. One of the most interesting is a Greek gravestone dating to about 350 BC (Fig 11). It commemorates a male who was probably not an athlete himself, but for aesthetic reasons, was portrayed as a perfect example of the human form. Around the time of the emperor Augustus, another male named Tryphon died. His name was carved above the figure in rather crude lettering. The head of the figure was also re-carved to resemble the emperor. It is almost certain that Tryphon did not resemble Augustus any more than the first possessor of the stele was an athlete. While past vanities may be amusing, the rationale can be easily understood. After all, who would not wish to have the body of a Greek god?

Some 45km to the south of Athens, perched above the craggy cliffs of Cape Sounion on the southern tip of Attica, stands the ruined temple of Poseidon (Fig 2). When constructed around the middle of the 5th century BC, the temple, with its Doric columns of locally quarried white marble, was an invaluable coastal landmark for mariners. It also provided a reminder to passing sailors from all states that the Athenians were the favourites of the god of the sea, and it was with his blessing that the mighty navy of Attica held sway over the sea-lanes of the Aegean. This period of Athenian domination of the Eastern Mediterranean extended from the war against Persia in 480/79 BC until the establishment of Macedonian hegemony over Greece in 322 BC.

As with the many other states and empires that crowded round the shores of the Mediterranean ‘like frogs around a pond’, as Plato described it, many Athenians looked to the sea for their livelihood, whether as sailors, seaborne traders, fishermen or even pirates. However, what would separate Athenians from all other maritime states during the Classical Age of Greek history was their unrivalled mastery of the trireme, the most powerful weapon of war yet to take to the waters of the world. Swift, manoeuvrable, and without equal as a warship, the trireme would allow Athens to project military and political power to any point in the known world that lay within reach of the sea. It was the slender hulls of fleets of triremes, propelled by the muscle and sinew of skilled rowers, that launched and maintained a golden age for Athens. The warship created and preserved the military, political, and economic conditions that allowed Athenian society to make great strides in philosophy, literature, and art, laying the foundations for much of the Western cultural tradition.

No physical remains of a trireme have ever been recovered from the seabed, and even well-funded expeditions to locations where ancient writers have described large numbers of triremes being sunk in naval engagements, or wrecked in storms, have failed to find any trace of the elusive galley. This should not come as a surprise, as the Classical trireme was built for speed and manoeuvrability and so was exceptionally light. Moreover, the ship carried no ballast, and the 200 rowers and sailors who crewed each vessel left virtually no room for cargo. Therefore, even when rammed and holed during combat, or broken up by the pounding waves of a storm, the vessels did not
sink and retained their positive buoyancy. Indeed, after most naval battles, if weather and sea conditions permitted, the triremes would be towed away by the victorious side and patched up and incorporated into their fleets. If they were too badly damaged, then the rams of captured enemy vessels were removed and placed on public display as trophies of victory (Fig 3).

It is to be hoped that a Classical trireme will one day come to light, possibly excavated from the anaerobic mud of a riverbank on to which it was drawn and left when its fighting days came to an end. However, until that happens, all our information about these famous war-galleys comes from references in ancient literature and from the handful of reliefs, frescoes, sculptures, coins, and vase paintings that depict triremes, most of which were created long after the Classical heyday of Athenian seapower (Figs 4, 5).

Although no actual physical remains of a trireme has ever been found, finds of merchant ships across the Mediterranean have provided archaeologists with priceless insights into how ancient ships were constructed. From the early medieval period through to the present day, wooden vessels of the Mediterranean have, virtually exclusively, been constructed in what is referred to as the ‘skeleton-first’ or ‘frame-first’ shipbuilding technique. As the name implies, the frame and ribs of the ship are constructed first and, once they have been secured in place, then the planking that makes up the sides of the vessel is nailed directly to them: a hull built in this manner therefore derives virtually all its structural strength and rigidity from the internal skeleton of the framework. However, the study of ancient shipwrecks has revealed that the principal method of Mediterranean ship construction during the Graeco-Roman period involved a radically different procedure, generally referred to as the ‘shell-first’ technique. The strength and rigidity of a vessel built in the shell-first manner came not from its internal framework but from the planking of the hull. This was achieved by building up the sides of the vessel, one plank at a time, from the central keel; the planking was laid edge-to-edge and locked together with tight-fitting mortice-and-tenon joints which were then pegged in place with dowels of hardwood. These closely spaced, interlocking joints provided the vast majority of an ancient vessel’s strength; the internal framework gave very little additional strength and was only added once much of the hull was already in place. The discovery of a bronze warship ram dating to the early 2nd century BC, recovered from the sea off Athlit, Israel, came complete with 16 fragments of the vessel’s bow still adhering to it: splinters that provided clear evidence that the shell-first construction technique was also applied to the hulls of ancient warships.

At Athens’ port city of Piraeus, naval inventories inscribed into stone provide invaluable information for aspects of some of the equipment required for triremes of the later 4th century BC. The stone footings of the ship-sheds of Zea, the main naval harbour at Piraeus, also indicate that if the warships were to fit inside, then the hulls were, at most, 37m in length and almost 6m across the beam.

It is 35 years since The Times carried the longest-running series of letters ever to appear in its correspondence section, discussing the various possibilities of the design and construction of the ancient Athenian trireme. The focus of the debate was the nature of the oar-system of ancient triremes...
and the number of levels at which the rowers sat in the warship, and it was concluded to the satisfaction of most, though by no means all, scholars that the trireme contained an oar-crew of 170 men seated on three different levels. The discussion in The Times also initiated the development of a full-scale working replica of the warship, designed by the retired naval architect John Coates, working alongside John Morrison, a classical scholar from Wolfson College, Cambridge. Their plans, models, and mock-ups formed the basis for the Olympia, which when commissioned into the Greek navy in 1987, became the first trireme to take to the seas since the 4th century AD (Figs 1, 7). The Olimpiai underwent a series of sea trials in the late 1980s, generating new and fascinating insights into the construction processes that went into the building of these remarkable ships and the cramped and uncomfortable conditions and high level of skilled oarsmanship that the crews faced when rowing such galleys.

Although there were different classes of triremes serving the navy of Classical Athens, they were all designed and constructed to maximise speed and manoeuvrability, the attributes likely to prove most decisive in battle. The galleys were therefore built long and narrow, so as to slice through waves rather than riding over them, and displacement and beam on the waterline had to be kept to a minimum to reduce the amount of immersed surface area and lessen the friction and drag generated between the hull and the water. For the oar-crew to function as effectively as possible, freeboard – the distance between a vessel’s deck and the waterline - also had to be kept low. These features made the trireme the fastest oared warship ever to sail the Mediterranean, but they took a heavy toll on the ability of the war-galleys to weather even moderate breezes and relatively small waves. So narrow and lightly constructed were Athenian triremes at the time of the Persian invasion in 480 BC that they carried only ten hoplites and four archers on their decks, and the hoplites were even required to throw their javelins from a sitting position so their movements should not, quite literally, ‘rock the boat’; any such rolling of the vessel would have made it exceptionally difficult for the rowers to take their strokes effectively.

The trireme appears to have been invented about two centuries before the Persian invasion. Clement of Alexander (c. AD 150-215) attributes the maritime states of Phoenicia with developing the new galley, and this is supported by Assyrian bas-reliefs, which depict Phoenician galleys with three levels (Fig 6). The Egyptian pharaoh Necho (r. 610-595 BC) was said to have constructed triremes which he operated on the Mediterranean and Red Sea (Herodotus, Histories, 2.159.1), while according to the historian Thucydides, writing in late the 5th and early 4th century, the Corinthians were the first Greeks to adopt the new warship. However, the vast funds required to build, equip, maintain, and crew even one of these technically sophisticated war-galleys meant that the wealthy elites who ruled most Greek city-states during the Archaic period (800-480 BC) preferred to use smaller one or two level galleys (Fig 8).

It was silver, mined from the low hills of Laurium to the north of Cape Sounion, that provided the wealth upon which was launched the naval ambition of Athens. In 483 BC, a meeting of the Athenian Assembly, a body consisting of all citizens of Attica, was held on the hill of Pnyx to decide how best to distribute the surplus from the state-owned mines to the population. With the urging of the politician Themistocles, the Assembly renounced the claim to a public handout of ten drachmas for each citizen, and instead adopted the idea put forward by Themistocles that all the silver revenue for that year be diverted to the building of 100 triremes. In 499 BC, Athens had been able to send only 20 ships, none of which were triremes, to aid their fellow Greeks in their revolt against the Persian Empire on the eastern shores of the Aegean. In a single show of hands, the citizens of Athens embarked on a new direction that, within just two years, would provide Athens with a state-owned trireme fleet that transformed the city into the leading naval power in Greece.
While Classical Athens owed its prominent position in Greek affairs to its powerful fleet of triremes, the ships themselves derived their lethal power from the sweat and skill of men drawn from the lowest classes in Athenian society.

At the time of the Persian Wars, each trireme consisted of a standard complement of 200 men divided into the three main categories of 170 oarsmen, 16 deckhands and petty officers, and usually 14 marines for close quarter fighting. This crew was capable of generating speeds of up to 18km per hour (9.7 knots) at the sprint, and almost 14km per hour (7.5 knots) over several hours. Herodotus claims that 180 Athenian triremes were deployed to counter Xerxes' navy at Artemision and Salamis in 480 BC (Fig 9), so more than 30,000 rowers were required to pull the oars of the Athenian trireme fleet that fought the Persians. In the 4th century BC, the fleets of the Athenian navy reached their zenith, with some figures suggesting more than 400 ships in service (some of which were new types of war-galley even larger than triremes).

With such vast numbers of highly skilled rowers required to pull the oars of the triremes that conferred naval mastery on Athens, it was inevitable that the oarsmen should also expect political recognition for their efforts. The Athenian democratic system came into existence, at least in part, as a result of the enfranchisement of the sailors of the increasingly important trireme fleet. Despite lacking the agricultural-based wealth upon which was founded the traditional hoplite warrior, the *thetes* – the lowest class of Athenian citizen – were to become central to the military ambitions of the city state. The *thetes* were also to gain an enhanced political status which reflected this shift away from the wealthy ranks of the army to the massed oar-banks of the navy.

By the middle of the 5th century *thetes* were allowed to stand for the highest magistracies, in spite of earlier legislation that excluded them holding these offices of state; recognition of the contribution made by this social class in ensuring Athenian naval supremacy.

It was Pericles who most readily grasped the potential of democratic government and its close relationship to the trireme fleet (Fig 11). To ensure the crews of the Athenian warships were maintained in a state of constant readiness in 449 BC, he also instituted a training programme in which 60 triremes were sent out on annual cruises lasting for eight months. This allowed the crews to hone their skills and techniques as they sailed the sea-lanes of the Aegean and Eastern Mediterranean, while the war-galleys also acted as potent symbols of Athenian naval might.

The wealthier social classes of Athens, which provided the heavy infantry and cavalry forces of the state and were not liable for service as rowers on the warships, took a hostile view towards the growth of naval power, seeing in its ascendancy the diminution of their own military and political prominence. Drawn from the landed elite and aristocracy, they deprecated the warship and the military and commercial power and values of the navy. Despite this, the trireme fleet developed into the most significant element in the Greek city states' military and political landscape.

With such vast numbers of highly skilled rowers, the potential of democratic government and its close relationship to the trireme fleet came into existence, at least in part, as a result of the enfranchisement of the sailors of the increasingly important trireme fleet. The wealthy social classes of Athens, which provided the heavy infantry and cavalry forces of the state and were not liable for service as rowers on the warships, took a hostile view towards the growth of naval power, seeing in its ascendancy the diminution of their own military and political prominence. It was mastery of the trireme that provided Athens with naval supremacy throughout most of the 150 years of the Classical period, and the warship allowed Athenians to extend their imperialistic ambitions across much of the Eastern Mediterranean. However, more than merely a sophisticated weapon of war, the trireme was a vessel that changed forever the political landscape of both the ancient and modern worlds. The galaxy empowered the lower classes of Athenian society, initially providing them with liberty from the Persian invaders in 480-79 BC, but also allowing them to cast off the yoke that had harnessed the majority of Athenian citizens to the wealthy elite minority.

It was on the rowing benches of the trireme that radical democracy was born and maintained.
Wrest Park in Bedfordshire is a minor stately home in the care of English Heritage. The present house, built in the French style in the 1830s by Thomas, Earl de Grey, replaced an earlier building, which was demolished after he inherited the estate from his aunt Amabel, Countess de Grey (d. 1833). The gardens, which are now being restored, were mainly laid out in the early 18th century, and were already regarded as old-fashioned by visitors such as Horace Walpole. A series of woodland walks and clearings radiate from a formal canal (the Long Water) and a baroque Pavilion dating from 1709-11 (Fig 5).

One circular clearing contains a group of five cylindrical marble altars arranged in an X pattern (Fig 1). The English Heritage guidebook labels them as ‘Graeco-Roman altars’ (Fig 2 shows images of the five side-by-side). Wrest Park was never endowed with other genuine antiquities (although a ‘Mithraic Altar’ was built there in 1748), and the altars have therefore escaped the attention of students of classical collections in England.

The clearing in which the altars are situated can be seen on a plan of 1737. The altars appear first in sketch plans made by Earl de Grey in c.1828 and 1834, and he drew them in a collection of watercolours of the grounds made in 1831, Views of Wrest (Fig 1). He added these notes:

‘These are believed to be genuine antique Greek altars. They were formerly the property of Topham Beauclerc [sic] Esqr at Muswell Hill near Barnet but nothing is known as to whence he got them. Upon his death they were purchased by the Countess de Grey about 1817, and were placed in their present position.’

The Earl’s memory seems to have been at fault here. Beauclerk, a well-known collector of books but not antiquities, died in 1780, and his collection was sold in 1781 (the sale catalogue, Bibliotheca Beauclerkiana, only lists books). His widow Diana lived until 1808, but moved house twice and is unlikely to have taken five massive altars (probably weighing half a tonne each) with her. The voluminous diaries of Countess Amabel survive, but a search of the years 1815-20 has produced no reference to the altars, and it appears that they had not yet been installed by 1820. Nor is there any indication from the diaries of 1808 of any dealings with Diana. Amabel did visit the Elgin Marbles in 1808, and described them in great detail, but without any reference to plans for bringing antiquities to Wrest Park.

The altars were noticed occasionally by later visitors to the gardens. William Treacher wrote in a pamphlet of 1899, based on Earl de Grey’s notes and his own rather romantic observations: ‘…we found a circular space amidst the trees, with four cylindrical stone altars round the outskirts and one in the centre, all moss-grown and dank
with age and exposure to the weather. On examining them closely we found they were ornamented with rams’ heads and wreaths of flowers (Fig 3).

On the centre altar is an inscription in Greek signifying that they were raised to the memory of Diogenes, the son of Jupiter, who conquered some great enemy. They are believed to be genuine antique Greek altars, and were purchased by the Countess de Grey about 1817.

They have remained in the same position in the gardens since the early 19th century, even though they were offered for sale for £50 when the estate was sold in 1917. After nearly 200 years of weathering, the decorations are not well preserved (Fig 7), although they are now maintained with care. The inscription is still legible, and with its help it is possible to be specific about the altars’ origin. They range from 84 to 99cm in height and from 67 to 85cm in diameter. Each one is decorated with four bulls’ heads (bucrania) linked by garlands of leaves and fruit. In most cases ribbons depicted in very low relief are draped over the bulls’ horns, hanging down behind the garlands. On one altar the spaces above the garlands are filled with rosettes. There are minor differences between the five altars, particularly in the profile of the top of each of them, and there is no reason to think that they formed one original group.

The Greek inscription on the central altar (Fig 9) is in high-quality lettering laid out carefully above one of the garlands. It reads:

Διογένῃ Ζήνωνος Ἀσκαλωνῖτα χρηστὲ χαίρε

For Diogenes [son] of Zeno, Ascalonite. Excellent one, Farewell

This shows that the altar was a funerary one, used to mark a tomb. In fact, the altar may have formed the tomb itself: two holes in the top surface have been filled in (Fig 8), and it is possible that one of them originally held some of the deceased’s cremated remains.

In the absence of direct evidence, the altars’ provenance has to be deduced from what is still visible. Altars with this style of decoration were common on the Aegean islands in the 2nd century BC, and better preserved ones show how the Wrest Park altars may have looked when first installed. The form of the lettering and the wording of the epitaph, particularly the formula at the end, are typical of the island of Delos and its adjacent burial island of Rheneia (burial on Delos itself was forbidden on religious grounds). Delos was a very prosperous commercial centre until it was sacked by Mithridates’ forces in 88 BC and by pirates in 69 BC.

Origin on Delos or Rheneia is made almost certain by the fact that Diogenes came from Ascalon (modern Ashkelon on the coast of Israel, which in the 2nd century BC was an independent Graeco-Phoenician city). Delos was a multi-ethnic trading port, where Italians and Syrians worked alongside Athenians and other Greeks. A community of Ascalonites on the island is well-known from inscriptions. Some 16 individuals are attested, of whom the leading figure was the banker Philostratos son of Philostratos. He was responsible for many architectural works on Delos: he built the north part of the Agora of the Italians, and an exedra in it, as well as making...
dedications to numerous gods in the Syrian Sanctuary, including Astarte, Aphrodite Ourania and Poseidon of Ascalon, on behalf of the city of Ascalon and his wife and children.

Delos was virtually abandoned from Late Antiquity onwards, and its ruins therefore became a source of material for collectors of antiquities. During the period of Ottoman rule until Greek independence in 1832, the island was particularly vulnerable. Sir Thomas Roe, who went on a mission to Constantinople in 1621, had Rheneia pointed out to him as ‘a rich mine of treasures’ by the Bishop of Andros, and informed the prominent collector and patron of the arts Lord Arundel of this. As a result, nine altars of the same type as those at Wrest Park became part of the Arundel collection, and they are now on display at the Ashmolean Museum in the Randolph Sculpture Gallery, where they are used as plinths for a variety of Greek and Roman sculpture. They can be seen performing exactly the same function before the collection was moved to its present home in William Westall’s watercolour sketch Old Schools of 1813 (Fig. 6). One of these altars has epitaphs in Greek and Latin for Quintus Avilius of Lanuvium, an Italian trader or banker on Delos, inscribed in much poorer lettering than the epitaph of Diogenes.

A second wave of looting of Delos by British and French collectors and their agents took place in the first three decades of the 19th century. William Martin Leake visited in 1806 and wrote that the shore of Delos was ‘strewed with broken columns and epistyla of marble’ – which is still the case, as many objects were abandoned near the harbour after the antiquities trade came to an end (Fig. 4). He also noticed the prevalence on Delos and Rheneia of altars ‘adorned with bulls’ heads and festoons’. Among the people who removed objects was Lord Elgin, who took two altars from Rheneia in 1802. These are now in the British Museum, along with two others which the Museum purchased in 1847. Many other altars similar to those at Wrest Park found their way to England at this time, and in 1824 the Director-General of the French Royal Museums encouraged the captains of the French navy to follow the example of the British in helping themselves to the antiquities of Delos.

Some altars were ultimately acquired by museums, such as one now in the Fitzwilliam Museum, Cambridge. This was given to Professor E.D. Clarke by Rev. Bridges Harvey of Jesus College, whose ‘ancestor’ had brought it from Delos, and was placed in the vestibule of the University Library by 1809. Others remained in private collections. Frederick North, 5th Earl of Guilford [sic], acquired an altar on Delos c.1810, and displayed it in his London house. It was bought from his estate in 1827 by Thomas Wentworth Beaumont and taken to Breton Hall near Wakefield, where it remained unnoticed in the grounds until Professor David Hill of the University of Leeds recognised what it was in 1995; it is now in the Rothschild collection at Waddesdon Manor. When sold by Christie’s in 2002 it had a guide price of £30,000-50,000 in the sale catalogue, rather different from what was asked unsuccessfully for the Wrest Park altars in 1917.

When Countess Amabel installed five Delian altars in the grounds at Wrest Park, she was in keeping with the fashion of the time. Delos does not seem to have been of particular interest in its own right, but as a source of supply for collectors of ‘Greek’ antiquities it was unsurpassed. The altars remain where she placed them as evidence of life and death on 2nd-century BC Delos, and of antiquarian interests among the 19th-century aristocracy.

The author would welcome any additional information relating to the removal of the Wrest Park altars from Delos and their arrival in Bedfordshire; please contact Dr Noy: d.noy@btinternet.com

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Maria Golia looks at the long and mutually beneficial relationship of photography with archaeology in investigations of Egypt’s history.

Long accustomed to darkness or the guttering flame of a traveller’s torch, in 1865 the King’s Chamber, set deep within the Great Pyramid of Giza, was illuminated by a prototypical flash, an explosive mixture of magnesium filings and gunpowder. The photographer was Charles Piazzi Smyth (1819-1900), Astronomer Royal of Scotland, and the photographs were part of a survey undertaken to prove that the pyramid’s architect was the Biblical Noah. Smyth’s attempts to scientifically buttress religious claims met with mixed reviews, and he went on to use his camera to study the properties of clouds. However, his work subsequently influenced the career of Flinders Petrie, one of the first Egyptologists to photograph excavations. Petrie’s parents had first met in Piazzi Smyth’s home, and Petrie’s father, a great admirer of Smyth’s theories, encouraged his son to survey the pyramids. Smyth’s work at Giza was one of many examples in which photography, an artistic medium still in its infancy, was advanced by the demands of the equally youthful science of archaeology. The sibling disciplines would develop alongside each other throughout the 19th and 20th centuries, each testing and improving the other as they grew to maturity.

William Fox Talbot was the British inventor of the calotype technique of photography, announced within weeks of the daguerreotype in 1839. He worked to promote his discovery as a tool for the study of antiquities, as it had several advantages for photographers in the field. The paper negatives could be prepared in advance, and exposure times were shorter than those required for daguerreotypes. Most importantly, calotype negatives could produce multiple positive prints, whereas daguerreotypes only permitted unique images. Talbot also suggested what would become a classic archaeological technique: that of recording and dating remains according to the successive layers of earth in which they were found. ‘I should think it would be highly interesting,’ he wrote, ‘to take a view of each remnant of antiquity before removing it, and while it remains in situ and surrounded with stones and bushes and all the other accompaniments of wild nature.’ Just as geologists had begun to calculate the earth’s age by examining stratification, so the study of antiquity was shifting its focus from ancient languages, architecture, and works of art, to archaeological investigations of material remains of all sorts. ‘Archaeologists pursued the positivist goal of revealing ancient civilizations as they once were,’ noted Claire Lyons, in the Getty Museum publication Antiquity and Photography, ‘by looking at artifacts emancipated from Scripture, ancient texts, and the motives of their authors. The study of antiquity was thus at the centre of an upheaval in world view in which the were high and verifiable visual evidence was essential. In the new faith of science, “seeing was believing”.’ Photography was there to provide the necessary proofs, and Egypt, with its incomparably rich ancient heritage, became a testing ground for archaeology’s development as science, and as a source of captivating, commercially valuable imagery.

In 1851, a new photographic process, known as the wet collodion or wet plate technique, was introduced in England by Frederic Scott Archer. Using glass plate negatives, it produced the sharp focus that calotypes lacked. Francis Frith, a former grocer,
Photographing Egypt

The interplay of tourism, archaeology, and photography may be said to have reached its apogee with Howard Carter’s discovery of Tutankhamun’s tomb in 1922.

six others, all fellahin (‘peasants’). The body of work Said and his student-colleagues produced for Reisner ranks amongst the great contributions to Egyptology.

His 20 years of experience digging and compiling a photographic record in Egypt and Sudan had shown Reisner that photography was by no means infallible. His 1924 paper on field photography included a section entitled ‘The Limitations of Photography’:

‘The excavator as a general rule can only photograph what he has observed. It is futile for an inexperienced man to hope to redeem his faults of excavation and observation by a copious photographic record… [Photography] can only differentiate shadows and colors. There are other things like consistency, perceptible to the eye or touch, but practically imperceptible to the lens of the camera… [they are] reminders to the eye of the excavator but are not much better than blank paper to one who has not seen the object photographed.’

In the 1850s, as Peter Dorrel observes in Photography in Archaeology and Conservation: ‘Archaeologists had begun to regard photography as a panacea, rather than as their descendants 100 years later were to regard C14 dating. Much the same sort of disillusion followed when it was realized that such innovations were capable of distorting evidence.’ By the end of the 19th century, the value of photographs as scientific documents was under question.

Reisner’s contemporary, James Breasted (1865-1935), Professor of Egyptology at the University of Chicago, was enthusiastic about photography’s educational applications, but shared Reisner’s concerns as to its limitations (Fig 6). Breasted supplied the text for a series of 100 stereographs, Egypt Through the Stereoscope, published in 1905 (Figs 4, 5). The stereographs, organised as a tour with Breasted as eminent guide, offered an illusion of substantial reality rivaling the real experience: ‘The viewer will have become more familiar with Egypt than most tourists to that country, who usually read so rapidly on the spot and are hurried about at such a rate that they bring home only blurred and confused impressions of what they have seen.’ In suggesting that stereographs were better than being there, Breasted betrayed a wish to staunch the increasing flow of tourists that began in 1869 with the opening of the Suez Canal and Thomas Cook’s steamer tours. He later founded an enduring institution dedicated to preserving the monuments using photography.

Frisch had cause for pride in his craft. Photography ignited avid public interest in, and therefore funding for, the study of Egyptology and related efforts to preserve Egypt’s legacy.

With the dawning awareness that ‘to dig is to destroy’, photography was increasingly implemented to preserve records of archaeological sites as they were dismantled and excavated. American Egyptologist George Reisner (1867-1942) made photography a systematic feature of his digs in Egypt. In 1902, Reisner was given permission to investigate the Giza plateau, and for 40 years excavated the Old Kingdom cemeteries that lay close to the great pyramids on behalf of Harvard University. Reisner’s achievements, aside from extensive finds, publications, and rigorous methodologies, include the training of some of the first Egyptian photographers. His staff was largely responsible for photographing 23iggs around Egypt and producing a staggering 45,000 glass plate negatives recorded in the process. Around the turn of the century, Reisner engaged a young man named Said Ahmed Said to assist in the darkroom, where he proved exceptionally talented. By 1906, Reisner had taught him how to use the camera and entrusted him with the documentation of the entire expedition. Said’s photographs illustrated not just the scientific process of the excavation, but also the drama of the digs and the strenuous labour they involved (Fig 2). He in turn instructed at least

Fig 2. Photo by Said Ahmad Said: Men at Work Moving Granite Block at the Menkaure Pyramid Temple, 1907. Silver gelatin dry plate.

Fig 3. Howard Carter (1874-1939), photographed while on a visit to the United States of America in 1924.

Fig 6

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learned the technique prior to traveling to Egypt in 1856. A product of Britain’s up-and-coming middle class, Frith’s talent, dauntlessness, and commercial instinct would combine to form the most successful photographic publishing career of the mid 19th century. Between 1858 and 1862, he published eight photographically illustrated books. The sparkling clarity of his images (Fig 1), in addition to their size (mammoth 48 x 38cm plates) contributed to their immense popularity: ‘A truthful record,’ Frith believed, ‘is of more value than the most elaborately beautiful picture’. More than pictures, Frith’s photographs offered the public a window on to Egypt – a country that, though distant, was becoming increasingly familiar.

Frisch realised his photographs would inspire greater numbers of people to visit Egypt, and understood the ramifications of his popularising. He described how the monuments were threatened by ‘travelers of all nations [who] break and carry off, without scruple, the most interesting of the sculptured friezes’. He likewise abjured modern economic developments that saw monuments dismantled and their stone blocks appropriated for houses and factories, even while recognising that these circumstances gave

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Fig 2. Photo by Said Ahmad Said: Men at Work Moving Granite Block at the Menkaure Pyramid Temple, 1907. Silver gelatin dry plate.

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The Chicago House in Luxor, the archaeological mission of the University of Chicago, began its epigraphic survey of Thebes in 1924. The goal was to create ‘documentation so precise it could stand alone as a replacement in the absence of the original monument’. A photographic archive was necessary, but Breasted realised this was not enough. The ‘Chicago House Method’, a meticulous documentation process, evolved to combine the efforts of photographers, artists and Egyptologists. So painstaking was the process that it took longer to copy the inscriptions, even with the aid of a camera, than it did to engrave them in the first place. For example, documentation of the Ramses III funerary temple began in 1924, has continued each winter, and is still ongoing. Meanwhile, the photographic archives of Chicago House and other archaeological missions, including the French Institute of Oriental Archaeology (est. 1880), and the German Archaeological Institute (est. 1907) have themselves become artefacts in need of conservation.

Photographic records from the early 20th century are now used to construct virtual reality tombs available to the public as online educational tools, and also to alleviate the pressures of tourism. Between 1914 and 1916 Robert Mond (1867-1938), a British industrialist with an interest in archaeology, conducted a photographic survey of the Tomb of Menna (TT 69) in the Valley of the Nobles, on the West Bank of Luxor. To accomplish this, he developed an innovative grid-photography technique similar to those used today to capture images for computer-based 3D models. The camera was attached to rails installed along the tomb’s walls, and pictures taken at overlapping intervals, covering every surface from floor to ceiling. The full-scale prints were mounted on cardboard, and the seams retouched to create the illusion of continuity. The resulting walk-through model Mond constructed now has a digital counterpart which, like the earlier stereographs, is promoted as a way of avoiding the crowds and gaining more information than a visit to the real tomb would allow. Yet despite such convenience, people still want to come and see the actual monuments of Egypt, and the country’s government does its best to make them welcome.

Photography and archaeology has done much to promote the value of Egypt’s Pharaonic remains. The interplay of tourism, archaeology, and photography may be said to have reached its apogee with Howard Carter’s discovery of Tutankhamun’s tomb in 1922 (Fig 3). Carter’s sponsor, Lord Carnarvon, sold the lucrative syndication rights for the excavation photographs to The Times, and Carter hastened to make the site available to the expected influx of tourists.

While Reisner and Breasted were photographing Pharaonic ruins unearthed from the sands, Sir Keppel Archibald Creswell (1879-1974) focused on Cairo’s Islamic legacy of mosques, tombs, and palaces, which had been all but devoured by the rapidly expanding modern city. He documented buildings throughout Egypt, including the extensive renovations undertaken in his lifetime. His photographs of buildings that have been entirely destroyed, alongside those that had been restored but which have subsequently again fallen into ruin, make these documents the more precious for the cycles of decay and renewal they portray. Along with his seminal publications, Creswell’s photographic collection helped rescue Egypt’s Islamic legacy from Pharaoh’s shadow.

Through a combination of scholarly interest and public curiosity, Egypt has been photographed literally inside out. From the first daguerreotypes and calotypes, to aerial and underwater photography, sonar, infra-red, laser, and satellite imagery, every available technique has been pressed into service to provide a record of Egypt’s monuments and artefacts. Mummies have been X-rayed and CT-scanned, the Sphinx probed with a video camera attached to a robotic drill. Technical advancements (most recently digital photography) have demanded constant reassessment of the medium’s advantages and possibilities for archaeology as a discipline, but they have also enhanced Egyptology’s value as spectacle. Along with the tourism it inspires, the alliance between archaeology and photography has had far-ranging implications for Egypt: never has a nation’s past so nearly supplanted its present in the collective mind’s eye.

This article draws on research carried out by Maria Golia for her recent book Photography and Egypt (Reaktion Books, 2010).
Rhone treasures

Elena Taraskina reviews a major exhibition, currently underway in Arles, which features archaeological treasures recovered from the waters of the Rhone.

For over 20 years archaeologists from the Department of Subaquatic and Deep Sea Archaeological Research (DRASSM) have been working closely with researchers, museum curators, and other professionals in the field of heritage management to excavate and conserve the exceptional archaeological finds recovered from the muddy riverbed of the Rhone. More than 700 of the items discovered over the past two decades are now on display in the exhibition 'Caesar, the Rhone of Memory', which traces the period from the 1st century BC through to the 4th century AD.

The Director of the Museum of Ancient Arles, Claude Sintes, has highlighted the importance of the archaeological work carried out in the demanding and dangerous conditions of the riverbed. 'We hope to set the scene that allows visitors to fully experience the sinister and disturbing environment for themselves... This “virtual immersion” will allow people coming to the exhibition to better understand the difficulties involved in carrying out archaeological work on the bottom of a river. This dark and dangerous setting is mimicked in the installation created by the artist Mark Dion, as are the laboratories in which many of the artefacts recovered from the river were restored (Fig 2).

The largest section of the exhibition is dedicated to the port of ancient Arles (ancient Arelate) and the role played by the city in maritime commerce during the Late Republic and Imperial Roman periods. Arles was certainly one of the major port cities of the western Mediterranean, and a great volume of local commerce, as well as long-distance trade, was conducted in the city throughout antiquity. The commercial nature of ancient Arles is stressed throughout the exhibition. The names of individual traders and merchants, or those of corporations, can still be read, inscribed on the plinths of statues which adorned the Roman city, or stamped and carved into the sides and lids of amphorae. These pottery containers were used to transport wine, olive oil, garum (fish sauce), and a variety of other essential and luxury foodstuffs in and out of Arles and the other cities of the ancient world. Discoveries such as coins (Fig 3) and an ancient set of weighing scales recovered from the swirling waters of the Rhone further emphasise the commercial transactions that allowed the city to flourish under Roman rule.

Seaborne trade connected Arles to other maritime cities and provinces that looked out on to the Roman-controlled Mediterranean Sea. The city also benefited from its location on the banks of the Rhone, which functioned as a major artery of trade, allowing the transport of commodities and people northwards into the heart of Gaul. The favourability of the riverine connections was stressed by the Greek author Strabo (c. 63 BC - AD 25) who wrote of how ‘...the courses of the rivers of Gaul are so excellently disposed in relation to one another that goods can...'
be conveyed from the Mediterranean to the Atlantic with ease and cargoes need only be conveyed over the land for a short distance and that without difficulty, while for most of the journey they travel by the rivers (Geography, 4.1.2).

Maritime trade in this region of the north-west Mediterranean, and along the Rhone estuary, with its constantly shifting banks and shoals, was, however, notoriously dangerous, and many ancient ships were lost while attempting to reach Arles. The excavations undertaken in the Rhone over the last two decades have found evidence of more than a dozen vessels that sank in the waters near the city, and the remains of these ancient merchant ships have been carefully preserved and placed on display in the navigation section of the exhibition (Fig 1).

Despite the hazards of waterborne commerce, Arles profited from its advantageous location, which allowed merchants and traders based in the city easy access to both the shipping lanes that ran across the Mediterranean Sea and the river systems of Gaul. During the Roman period, Arles therefore became the dominant port of southern Gaul, eclipsing the older city of Massalia (Marseilles), which, according to the historian Thucydides, had been founded by Greek colonists from Phocaea in c. 600 BC (Histories, 1. 13). However, while Arles was blessed with a navigable river that provided easy access into the heart of Gaul, Massalia had no such riverine routeway, and the mountainous spurs of the Maritime Alps to the north and east of the city also made overland transport difficult. Massalia had therefore declined into little more than a university town by the Roman Imperial period.

Arles was therefore able to overshadow Massalia as the most important city of the province of Gallia Narbonensis through political as well as geographical reasons. During the Civil War that raged across the Roman Mediterranean from 49-48 BC, Arles backed Julius Caesar, while Massalia sided with his rival Pompeius Magnus.

With the defeat of the latter following the Battle of Pharsalus in 48 BC, Massalia was deprived of many of its territorial possessions, and these were handed to Arles as a reward for the city's loyalty to Caesar. On Caesar's orders, Arles was given the title and rights of a Roman colonia and, in 46 BC, was formally established by Tiberius Claudius Nero, father of the future emperor (Fig 4).

The much-discussed centerpiece of the exhibition, accentuated by dramatic lighting, is the life-size head of a prominent Roman who the museum authorities contend is Julius Caesar (Fig 5). Recovered from the silt and weed of the Rhone by underwater archaeologists in the autumn of 2007, the head is in an exceptional state of preservation, with only a little fracturing on the nose. Given the relationship of Arles with Caesar, it is understandable that immediately on recovery of the marble head, archaeologists and journalists proposed that this was a representation of the Late Republican dictator. In the spring of 2008, Le Monde published a picture of the statue on its front page, under the headline 'Julius Caesar emerges from the Rhone'.

There are certainly a number of physical attributes of the sculpture that match other those on statues made of Caesar, or his portrait stamped on to coins. The museum features a film documenting the restoration process...
the sculpture underwent on being removed from the Rhone, and analysing how the facial characteristics of the head matched those of known images of Caesar, with the prominent Adam’s apple and receding hairline. It has been argued that the statue was carved around 46 BC, very possibly from life while Caesar stayed in the city. On 13 May 2008, the French Culture Minister stated that the statue was the oldest surviving sculpture of Caesar. With the assassination of the dictator in Rome two year later, it has been argued the statue, suddenly regarded as politically undesirable, was deliberately smashed and thrown into the Rhone.

Some scholars have, however, been more cautious in identifying the head of the statue as that of Caesar, pointing out that the face is rather fleshiwer than other depictions of the hollow-cheeked dictator in the years immediately before his death. Caesar is also usually portrayed as possessing a nose rather less bulbous than that which appears on the Arles head, while the nasolabial folds – the skin that stretches from the sides of the nose to the corners of the mouth – are also unlike other depictions of the Roman general (Fig 6). There is no doubt that identifying the statue with so famous a historical figure has generated a great deal more publicity than would have been achieved for a sculpture associated with a lesser figure from the Roman past. Moreover, the very title of the exhibition, and the manner in which it is presented in the gallery, indicate the prominence given to this single artefact.

Alongside the contentious head of Caesar, a beautiful bronze Victory is displayed (Fig 7). Dressed in a Greek chiton, cinched at the waist, Victory appears to be about to take flight, with her eyes fixed straight ahead. Although the wings and arms have been lost, the hairstyle and the profile of the nose are of Hellenic inspiration and appear to refer to the classic workmanship inherent in female figures of the Praxitelean type. Also fashioned from bronze is a sculpture of a bound figure, a bearded and heavily muscled warrior (Fig 8). Although defeated, the naked figure is nonetheless portrayed with a dignified demeanor, kneeling on his left knee, his hands tied behind his back, his head tilted as he looks upwards and to the left. Upon close examination, the anatomy of this captured man is out of proportion: the right leg is shorter than the left and the feet are excessively long; the arms are short, while the wrists are delicate and the arms short. While displaying clear Greek influence, it is thought the statue portrays a Gaulish prisoner, an opinion that, if correct, would make the bronze one of the earliest surviving representations of a captive Gaul.

Throughout the Late Roman Republic, vast numbers of slaves were taken from Gaul and transported to the lands of the Mediterranean, where they were used to work in the fields, mines, and the multiplicity of other roles for which human muscle was necessary to power the economy of the Roman world. Writing in the 1st century BC, the Greek author Diodorus Siculus (quoting the slightly earlier writer Poseidonius) highlights the ease with which Roman slave traders would use alcohol to procure vast numbers of slaves very cheaply through trade with the Gallic communities: ‘Italian merchants, with their usual love of money, regard the Celtic passion for wine as a source of treasure. They transport the wine by boat on the navigable rivers and by cart through the open country and they get an incredibly good price for it: for one amphora of wine they get a slave – a servant in return for a drink!’ (Histories, 5.26). With its location astride the Rhone, which offered ready access to the interior of Gaul, Arles was well placed to take advantage of
tribes of Gaul between 58-51 BC. Itary campaigns directed against the greaty increased during Caesar’s mil-

were some 300,000 Gallic slaves in Italy has therefore been estimated that there relationship with the trade in slaves, it scale of the wine trade, and its close

as fragments spread over a wide area of the river-

Fig 13. Limestone Corinthian capital carved during the Julio-Claudian period. H. 72cm. Photo: Musée départemental Arles antique © Maby J.-L L.Roux.

Fig 14. The neck and handle of a bottle blown from blue glass, 2nd half of the 1st century AD. H. 10.4cm. Photo: Musée départemental Arles antique © Maby J.-L L.Roux.

Fig 15. Bronze amphora dating to the early 1st century AD. H. 44.5cm. Photo: Musée départemental Arles antique © Maby J.-L L.Roux.

Fig 16. Clay oil lamp with a broken handle, c. AD 70-100. L 16cm. Photo: Musée départemental Arles antique © Maby J.-L L.Roux.

Fig 17. Gold ring for a woman or possibly a child, 1st century AD. Diam. 1.4cm. Photo: Musée départemental Arles antique © Maby J.-L L.Roux.

household items such as kitchen utensils (Fig 10), metal tools, oil lamps (Fig 16), toys, and little statuettes, washed into the river during flood-
ing or intentionally thrown into the Rhône over several centuries. This section of the exhibition is titled ‘The Junkyard’ from the amount of refuse found by the archae-
ologists. However, mixed in with the household waste are remnants of fine jewellery (Fig 17), well-made glass-
ware (Fig 14), and bronze artefacts (Fig 15) that point to the wealth in the region. The anaerobic conditions in the mud at the bottom of the river have allowed for wonderful preservation even of organic objects, which would normally have rotted away over the centuries, and the exhibition includes items such as remnants of cloth, rope, and wood, which have all survived in the silt of the riverbed.

Upon the termination of ‘César, the Rhône for Memory’, the artefacts recov-
ered from the river will be incorporated into the permanent collection of the museum, for which a new extension has been proposed. New discoveries made by archaeologists working in the River Rhone throughout 2009 have led Luc Long to believe that many treasures yet remain in the murky waters that will no doubt be added to the museum exhibi-
tion over coming years.
In 1997, David Kennedy (University of Western Australia), who had been carrying out archaeological research on Roman frontiers in Jordan, sent Bob Bewley an email asking if they could work together on a potentially exciting project using aerial survey for archaeological research in Jordan. Thus began 15 seasons of aerial reconnaissance and photography.

Prior to the first flight for this project, David Kennedy had been systematically examining some 4000 aerial photographs taken of western Jordan in 1953 by Hunting, a commercial survey company. This investigation led to a staggering 25,000 features being identified, many of which were of interest to archaeologists. At that time, Jordan’s national archaeological database had approximately 8000 recorded sites, so this was an exponential expansion of the known resource. The most efficient and cost-effective method of exploring these potential sites was from the air.

In 1997, after many years of trying to obtain permission and gain access to aircraft, especially helicopters, the Royal Jordanian Air Force provided a trial flight, and since then Kennedy and Bewley have flown in their Huey or Super Puma helicopters (Figs 1, 2, 3). There was a brief interlude when the researchers were obliged to use a Cessna 150 (a high-wing aircraft familiar to aerial archaeologists in Europe), but the helicopter is better suited to the terrain and location of airfields in Jordan. It also provides a very stable platform for photography through the wide viewing area offered by the huge open door.

The method of locating and photographing the archaeology of Jordan is relatively simple. Unlike other parts of the world, where cropmarks or soil marks indicate the presence of archaeological structures, in Jordan the sites are mainly upstanding and have been relatively well preserved, at least until recently. The vast majority of Jordanian sites are also either stone-built or of earthwork construction and the low, raking sunlight of early morning or late afternoon creates shadows, so their features can be photographed in a great deal of detail (Fig 4).

The Jordanian authorities were willing to cooperate with the researchers because of the project’s role in maximising Jordan’s potential as a tourist destination. Some of its historic sites are widely known, such as Petra (Fig 6) and Qasr Amra (Jordan’s two World Heritage sites); Jarash (Fig 5), Pella, Umm Qeis, and other Decapolis cities; and Mount Nebo, Madaba and Crusader Castles such as Kerak and Shaubak. There are, however, many more sites that are worth visiting for those interested in Jordan’s rich archaeological landscapes. The aerial survey work aims to achieve a greater understanding of the nature of these sites, as well as revealing the pressures being placed on the fragile archaeological landscapes.

It became clear very early in the project that the landscape was under threat. Every town, city, and village, even those on or near important archaeological remains, seemed to be undergoing a house-building boom, while in the rural areas there were farm projects and bulldozers everywhere. The researchers realised that their work had a greater significance than they had at first thought: they were recording sites that might be destroyed in the near future (Figs 7, 10).
to south and flows into the Dead Sea, the lowest point on earth. The land rises up sharply from the Dead Sea, with deep-cut gorges, the largest of which is the Wadi Mujib. On the limestone plateau in central Jordan (Biblical Moab and Edom) the land is very fertile; in the north the rolling hills have a Mediterranean feel, with trees and olive groves, as well as some spectacular sites such as Jarash, Ajloun Castle (Fig 8), Umm Qais (ancient Gadara) and Pella. Further south, the landscape around Petra and Wadi Rum becomes mountainous before leading down to the small coastal area around the growing city of Aqaba.

Heading east, the limestone gives way to a black basalt lava desert, part of the great Harrat Ash-Shams. Despite its seeming bleakness, in the northwest there are abandoned Nabataean and Roman towns such as Umm el-Jimal, as well as forts, roads, and villages. In the region around the Azraq Oasis, the landscape is strewn with tens of thousands of enigmatic prehistoric walls, kites, wheels, and burial cairns and pendants (Figs 9, 13). This wealth of important historic and prehistoric sites attracts many archaeological teams to the country each year. The aerial images help them with their research and highlight areas which would otherwise take days to survey.

Fig 4. The late Roman site of Qasr Bshir, and a Nabatean fortlet (top right) photographed in low morning sunlight. Probably a winter palace for a Roman governor, above the main entrance is an inscription with the name of the praeses, Aurelius Asclepiades, c. AD 293-305.

Fig 5. Roman Jarash flourished between the 1st and 3rd centuries AD. However, the site was occupied from the early Bronze Age, and there was Umayyad activity in the 7th and 8th centuries AD.

Fig 6. The so-called 'Monastery' ('Al-Deir') at Petra, c. 1st century BC.

Fig 7. New roads and houses encroach on the ruins and ancient necropolis of the hilltop site of Tunayb.
or might not be visited at all (Fig 11).

The excitement of an aerial survey can be likened to a voyage of discovery. In 1999, the team flew over the limestone landscapes east of the ancient city of Jarash to photograph a Roman tomb in the village of Ain. On the adjacent hill-top, they noticed a clear rectangular structure, apparently a small fort that had not been seen or recorded before. A visit to the site a few days later turned up finds of pottery that suggested occupation between the 2nd century BC to the 7th century AD (Fig 12).

In the 1920s the RAF opened up the region by creating an air-mail route from Cairo to Baghdad. This required a combination of pioneering spirit and overcoming simple practical navigational problems, including ploughing a furrow for the pilots to use to help them fly in the right direction. But there was also an archaeological benefit of the pilots observing the ground – they spotted large, kite-shaped stone enclosures, which they reported in archaeological journals (see Antiquity 1927 and 1929). Since then these enigmatic sites have attracted some archaeological attention, but perhaps not the amount of research they deserve (Fig 9). Bewley and Kennedy have enlisted the help of a doctoral student, Karen Henderson (University of Western Australia), to examine the distribution and nature of these sites which occupy whole landscapes – all interconnected and ‘articulated’, suggesting their use over a long period of time.

In the same areas where the Kites exist, are also found circular forms, collectively termed ‘Wheels’ (Fig 13). These are probably burial mounds or religious in character, as are the ‘Pendants’, large burial cairns which run a ‘tail’ of small cairns. Some of the sites in these areas may be settlements, but these have yet to be investigated, so their function is not yet fully understood. Although there are many areas where these sites exist untouched, there are also large areas where a variety of forces have combined to remove the stones once and for all.

The project has highlighted the plight and fragility of a whole new type of site – the ‘Circle’. Although one or two of these large, circular stone-built sites had been known before the project began, they had never been subject to archaeological study. Bewley and Kennedy have recorded over a dozen of these sites, the majority of which are almost exactly 400m in diameter, and often located in pairs. On the ground these sites would hardly be visible, but when photographed from the air in the right light, they are very clear. However, as yet, the researchers have no idea what these structures were for or how old they are. They thus stand as something of a metaphor for all Jordanian archaeology: that there is a vast treasure-trove of archaeological sites to be recorded and discovered, but speed is of the essence if they are to be properly investigated and understood before they are destroyed.

Tourism plays a major part in the economy of Jordan, and visitors flock to Petra, Jarash, Madaba, Mount Nebo, and the resorts on the Dead Sea. One of the primary aims of this research has been to highlight the rich archaeological heritage that lies beyond these wonderful sites. However, bringing fragile monuments and landscapes to public attention has to go hand-in-hand with measures designed to protect and
The excitement of an aerial survey can be likened to a voyage of discovery

conserve the archaeology, and sites that were visited frequently in the past can suffer damage if access to them is increased. For example, Aseikhim is a wonderfully remote and hugely significant site, with finds that stretch back as far as the Palaeolithic, while the visible remains include Neolithic, Roman, and Umayyad construction. However, an access road created to allow work to be carried out on the site to improve its appearance for visitors had the unintended consequence of allowing large bulldozers the opportunity to access the area and remove a large amount of rubble for use in the construction industry.

Two more flying sessions are planned for 2010, as well as a third workshop to continue training local archaeologists in the various methods of landscape archaeology and aerial survey. It is a credit to Jordan’s openness and desire to embrace new methods of archaeological research that these techniques can be practised. It is hoped that aerial investigation will also spread to adjacent countries.

All photographs by the authors and the Aerial Photographic Archive of Archaeology in the Middle East (APAAME).

Robert Bewley and David Kennedy have published the book Ancient Jordan from the Air (Council for British Research in the Levant, 2004) while their aerial research has created thousands of images available online at www.flickr.com/photos/36925516@N05/.

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Until 18 July 2010, the Peabody Essex Museum in Salem, Massachusetts, will be home to ‘Fiery Pool: The Maya and the Mythic Sea’, devised by Daniel Finamore, Curator of Maritime Art and History, and Stephen D. Houston, Professor of Archaeology at Brown University. The exhibition is remarkable in that it offers a new way of looking at the art of a great civilisation, and will become the standpoint from which all Maya art is assessed in future, Daniel Finamore believes.

At the height of its power, between 300 and 900 AD, the Maya civilisation spanned hundreds of cities across Mexico and Central America. With a culture that was highly advanced in mathematics, astronomy, architecture and art, the Maya practised a complex religion and used a refined pictorial writing system composed of more than 800 glyphs. Interpretation of this language has been central in attaining an understanding of Maya culture. While today 90 percent of glyphs are understood, it was only in the late 1980s that a glyph for the sea was identified. Translated literally as Fiery Pool, identification of this glyph was part of a growing awareness of the centrality of the sea to Maya life.

‘We are still establishing our understanding of Mayan iconography, but today we are able to see things that weren’t recognised 20 years ago. In the past, images of water in Maya art were studied from a practical point of view, in terms of the information they conveyed about travel or trade. Many overblown ideas about Maya seafaring have been put forward in the past; in fact, no Maya canoes survive, and there is no evidence that the objects traded from distant cultures were brought by Maya canoes, as opposed to those of neighbouring groups,’ says Finamore. ‘It is far more interesting, and far more illuminating, to examine the significance and symbolism of the sea in the Maya world view. The sea and water were central to the Maya, even those who lived far inland, and many artistic motifs actually emphasised this – but it has not previously been recognised by Mayaists. These images of water represent something more than everyday practicalities: the passage through the phases of life.’

Accordingly, the exhibition is organised in four thematic sections.

Water and cosmos
More than a necessity to sustain life, water was the vital medium from which the world emerged, gods arose and ancestors communicated. The first section of the exhibition presents the viewer with an introduction to how water is represented in Maya art, and the prominence of its role in their belief system. As Daniel Finamore explains: ‘In the Maya mind, all water was unified. The sea, rivers, lakes, mist, clouds, atmosphere – all were interconnected and central to daily existence. Water was seen as a central, powerful force with its own motivations.’

The Maya likened the curve of the earth to the carapace of a giant turtle, swimming in a cosmic sea. A lidded pottery bowl, made in Guatemala around AD 300–400, serves as a microcosm of three vital areas: the sky is indicated by a bird, the earth by a turtle, and the waters by a horizontal band with shell-like volutes (Fig 2).
turtles' power lies in its ability to break the boundary between the worlds of air and water. Another beast with a central role in origin and creation mythology is the crocodile, which possesses the same ability. A lidded vessel, almost half a metre in diameter, depicts the battle between mythical beasts and humans (Fig 1). The cosmic crocodile is shown eviscerating its victims, their blood streaming down the sides of the vessel, where it merges with the sea. The vessel dates to AD 500, and scholars are still interpreting its complex meaning. However, this gory image is a reference to the creation of the world – the presence of blood at birth and at death – and has links to bloodletting rituals during life.

Like these mythic beasts, Maya rulers and noblemen were believed to possess the ability to exist in two worlds at once – a royal court and a water-filled cavity (Fig 3). Dating from AD 795, this panel shows the ruler known as Tajchanahk – ‘Torch-Sky-Turtle’ seated on a throne in the shape of a water-lily, and presiding over two lesser lords. The scene is bordered by a bubbly, watery band, and the four-lobed shape of the panel signals an underground hollow or cave. The two lords’ arm-gripping posture is a sign of subordination, and while all three figures have water-lily headdresses, a fish is nibbling at Tajchanahk’s. He is on his throne, ruling – yet surrounded by water; he is able to rule because he can control that element.

Creatures of the fiery pool

The world of the Maya brims with life, animated, realistic and supernatural, often all brought together in a single scene. Objects in the second section of the exhibition portray a wide array of fish, frogs, birds and mythical beasts inhabiting the sea and conveying spiritual concepts. The Maya viewed all aquatic creatures as imbued with their own life force and the spirits of ancestors, so although these are works of art in their own right, they can also be interpreted on a deeper level.

Many of the artefacts in this section are accessible representations of familiar creatures. Frogs are inextricably linked to water through their aquatic metamorphosis from egg to tadpole to adult. The delightful carving of a swimming frog embodies that connection – the creature is carved from an aquatic material, Oliva porphyria shell, which is found in the southern Pacific Ocean (Fig 7). Its eyes are smooth stones, and the natural pattern and colour of the shell reflects the texture of the frog’s skin. The carving formed part of a sumptuous burial offering from the island of Topoxte in Lake Yaxha, Guatemala, and dates from AD 700-800.

Ducks were used in Maya art to represent wind, vitality and the life force. The exhibition does not feature many pieces of blackware, but the vessel with a duck lid (Fig 5) is a particularly fine and complex example. Bands of dots and circles around the rim of the lid and the outer body of the vessel represent the surface of still-water – a possible allusion to the swampy habitats preferred by muscovy ducks and their prey. The vessel dates from c. AD 500 and was found at Becan, in the centre of the Yucatan Peninsula. The Maya would have noted the ease with which water fowl move between the sky and the waters. Some even plunge from the air to below the water’s surface – descending into the underworld and emerging unscathed. A massive stucco carving of a pelican from the site of Comalcalco, a city near the swampy estuaries of the Gulf of Mexico, pays tribute to this ability (Fig 6). This naturalistic sculpture includes the bird’s rounded head and narrow bill, and cross-hatching is used to represent the stretchy, featherless skin of its throat – and possibly to echo the texture of a turtle’s shell.

Among the Maya and other peoples of Mesoamerica, the conch served as a basic symbol of the sea (Fig 4). The spiral form of these large shells evokes volutes of breath and wind, phenomena closely linked with the moist ocean breezes. The spirits of the ancestors were believed to rise from the sea to form clouds and thus bring precious rain back to earth. This conch trumpet features a floating ancestor, only the head and elaborate headdress shown. The headdress depicts the rain god Chahk, and the clouds swirling beneath...
The original mural was part of a cycle, and the Maya relied on images of the vessels to research their structure and uses. However, one of the most detailed images of a Maya canoe has nothing to do with trade (Fig 8). Portrayed on a drinking vessel that depicts the death and rebirth of the Maize God, the scenes show maize entering water (death) and the watering of seed corn (rebirth). His watery voyage is rendered on a black background to mimic the murk of primordial time. In one part of the image, the Maize God is transported in a canoe guided by the so-called Paddler Gods. They propel the craft in asynchronous fashion; one paddle enters the water as the other is drawn out, suggesting that, as deities, normal nautical rules do not apply to them. Beneath the canoe, another version of the Maize God is nibbled by fish – perhaps a reference to maize being used as bait by fishermen.

One of the only extant images of boats being used as transport is a watercolour copy, by the American archaeologist Ann Axtell Morris, of a mural discovered at Chichen Itza in the 1920s (Fig 9). The original paintings had been preserved for a thousand years in the ruins of the Temple of the Warriors, created from AD 900-1100, but are now almost entirely eroded, so these painstaking copies are all that remain. They contain unique, if enigmatic, historical data. The original mural was part of a cycle, which appears to depict a conquest and shows many scenes of destruction, including sieges, prisoner-taking and human sacrifice. Dark-skinned warriors, probably Toltecs, are led to victory by a divine plumed serpent, while the less fortunate Maya are rendered in a lighter hue. This particular painting depicts a moment of calm: a bustling village goes about its daily business while the warriors slip past, unheeded, in canoes. The ocean is rich in detail: crabs, fish, shellfish and stingrays surround the invaders, and may represent the presence of ancestral spirits.

The Maya were major players in the trade of jade around central America, and the exhibition includes some remarkable objects made from this material. The single largest piece of jade sculpture from the Maya world is a carving of the head of a god, worked from a single piece of jade and weighing almost 5kg (Fig 10). The sculpture was discovered in 1968 at the site of Altun Ha, Belize, in the tomb of an elderly man, who was buried with it nestling in his arms. It dates from AD 550-650.

The Maya lacked metallurgy as well as native sources of turquoise, so the discovery of a pair of ear spools at Santa Rita Corozel, Belize, attests to long-distance maritime trade with central Mexico (Fig 11). As well as a clear Mexican influence in their design, the ear spools contain materials that were probably imported from locations around Mesoamerica, including the American South-west, Costa Rica and Panama – evidence of a vast and complex network of communication, contact and trade, reliant upon the sea for its existence.

Birth to rebirth

The final section of the exhibition addresses the cyclical motion of the cosmos as the Maya experienced it. The sun rose in the morning from the Caribbean in the east, bearing the features of a shark as it began to traverse the sky. Cosmic crocodiles exhaled storms and battled with gods of the underworld, while on earth the rituals of everyday life went on. This section of the exhibition comprises four themes: birth, life, death and rebirth, and we see deities and humans moving through the cycle.

Each day began with the re-emergence of the Sun God from the ocean, an event depicted on a pottery incense burner (Fig 13) made in Palenque, Mexico, in AD 700-750. A water curl down his cheek shows his aquatic origins, and he carries Spondylus shell ear ornaments linked to Chahk, the Rain God, who also rises from the eastern sea. A shark serves as his headdress, and above it protrudes the head of a crocodile, as if the god is rising from the depths of the water. Gods required potent offerings from the ancestor's chin convey his ethereal nature as the embodiment of rain. When the trumpet was held horizontally to be played, the ancestor's face would seem to gaze downwards from the sky.

Navigating the cosmos

Beyond its necessity to sustain life, water in the Maya world was a source of material wealth and spiritual power. All bodies of water – rivers, cenotes (deep inland pools) and the sea – were united, and all could be traversed to a cosmic realm. They could also be crossed by canoe for purposes of trade. As noted, no Maya canoes survive, so scholars rely on images of the vessels to research their structure and uses. The ocean is rich in detail: a shark serves as his headdress, as if the god is rising from the depths of the water.

Beyond its necessity to sustain life, water in the Maya world was a source of material wealth and spiritual power.
Maya mythology

their subjects. A carved lintel, one of three commissioned by Ix K’ab'al Xook, chief wife of the king known as Itzamnaaj Bahlam of Yaxchilan in AD 723 and 724, depicts her and her husband engaged in a variety of ritual acts (Fig 12). Here, Ix K’ab'al Xook has used stingray spines to pierce her tongue, and is allowing the blood to flow on to strips of paper, which will be burned in offering to the gods. From the smoke in the bowl in front of her, the Rain God Chahk is emerging from the maw of a giant, double-headed centipede.

By night, the Sun God takes on another aspect: he transforms into the Jaguar God of the underworld (Fig 16). In this figurine, carved on Jaina Island, Mexico, in AD 700-800, he is depicted riding the earth crocodile, his dominance over it suggested by his grip on its jaw and thus his control of its breath. He sits in the posture associated with rulers on their thrones, and the crocodile appears relaxed and docile, its snout turned towards the deity. In this way, the god of night tames the earth and steers it towards dawn and rebirth.

Mortals, too, required guidance through the underworld on their journey towards new life. In 2006, the tomb of an unknown ruler was discovered in a temple acropolis at the ancient Maya city of El Peru Waka. An exquisite array of figurines had been buried with the ruler, to accompany him into the afterlife. The 23 figurines display unerring attention to detail, and had been painstakingly arrayed on a stone bench in the chamber, each with its own role to play in the transformation of the dead Maya king into a healed and reborn spirit. The tableau includes an anthropomorphic deer (Fig 14), which may be the ‘way-creature’ – a supernatural co-essence or spirit companion – of the shaman seated in the centre of the ring. Also in the scene are a frog, a hunchback scribe, and four dwarves. One dwarf bears particularly potent references to the role of the ocean in the process of rebirth (Fig 15). Clad in an elegant deer head-dress, he holds a conch trumpet, used to create conduits to convey gods and ancestral souls from this world to the next. The note he sounded could open the portal that would allow the dead king to pass along the watery path of the night sun, and be reborn.

Civilisation of gold

Dalu Jones reviews an exhibition in Brescia examining the origins of the Inca Empire

The exhibition provides a rich panoramic view of the pre-Columbian cultures that flourished in Peru for the 3000 years until the arrival of European Conquistadores in AD 1532. It plots a course through the variety of lesser-known societies that would ultimately mesh together to form the famous, yet short-lived, Inca Empire (AD 1440-1539). The artefacts on display also provide an evocation of the environment, the myths and the rituals that set a context for their creation, as well as the mysterious functions they were intended to fulfil. Emphasis is placed on the importance that precious metals had in the development of the ancient cultures of the Central Andes.

Adoration of gold is a theme that runs through all the cultures that evolved in the Andean region, and glorification of the metal would ultimately...
entice Europeans to the area and bring about the collapse of the Inca Empire. Archaeological evidence indicates that metallurgical techniques developed independently in three separate regions: the cultures of Northern Peru, characterised by gold sheets (tumbaga) and gilding; the societies of the Bolivian highlands, Northern Chile, north-west Argentina and southern Peru, which produced objects in copper and bronze; and a centre in Columbia where the preferred method of metalworking was the lost wax technique. Gold appears to have been in use some 4000 years ago, while the working of silver and copper developed between 1500-1300 BC. The metals were employed in ritual and funerary implements and as an expression of social status.

Many of the most spectacular objects currently on display in Brescia were created by the Sican-Lambayeque culture (c. AD 800-1375), a coastal state located in the north of Peru, which predated the Incas. On loan from the Bruning Museum, Lambayeque, Peru, the treasures were part of elite funerary traditions in which tombs (faros), furnished with exceptionally rich funerary goods, were positioned at the base of deep vertical wells. Large burial mounds were then raised over the well shafts. Most current knowledge of Sican burial customs, and the social structure of society as a whole, comes from the rich graves excavated at the Huaca Loro site in Poma. Grave goods collectively weighing more than a ton were recovered from a single tomb at the site, and offer clear evidence of the highly developed skills practised by Sican artisans, particularly smiths working with gold and silver. The deceased were often buried with gold crowns and masks, or the peculiar narigueras which were designed to hang from the nose of the wearer and cover the nostrils and mouth (Fig 4). The hands and forearms were sometimes fitted with golden gloves or gauntlets (Fig 7), while the hands might grip a golden cup decorated with motifs referring to the god Naymlap, mythical founder of a dynasty of Sican rulers. The manner in which the body was positioned also indicated social position in Sican society, with the elite always buried in a sitting posture.

The ceremonial clothes of the ruling elite of the Sican and many of the other pre-Columbian cultures of Peru were covered with gold (Fig 5), while ornaments such as crowns and other elaborate headwear, ear-rings, necklaces and pectorals were fashioned from the high status metal. These and a great variety of other objects were used for the many religious ceremonies that guaranteed the equilibrium of the cosmos and a successful harvest (Figs 1, 6). So important was gold to the civilisations of the Andean region that even the mines and riverbeds from which the metal was extracted were regarded as sacred and worshipped accordingly. The significance of gold and silver to the Inca was far more than merely its material value. According to the mythology of the culture, gold represented the sun god, Inti, while silver was the manifestation of his sister/wife, the moon goddess Mama Quilla. According to one of the most common of Inca foundation legends, it was their son, Manco Capac, who was sent to Earth to teach human-kind how to live in a civilised manner.

**Metal and mythology**

Through a dazzling display of gold and silver objects presented in the exhibition, visitors can explore the belief systems of the peoples of ancient Peru and...
the mythologies that pervaded everyday life. Religious rituals guaranteed a balanced relationship between the sky gods, the earth, the world in between, and other worlds believed to be made of the ‘alter ego’ of all animate and inanimate things, guarding the knowledge of the present and the future. Gold was considered a living force that allowed contact with cosmic forces.

It appears that the origin of many of the rituals, iconography and cosmological concepts shaping the cultures of the Andes originated on the northern and central coast of Peru, rather than in the Chavin culture (1500-200 BC) of the central Andes, as previously believed. Religious rites were characterised by shamanistic practices and the ritual use of drugs, especially those derived from the San Pedro cactus (Trichocereus pachanoi) as well as the widespread use of coca leaves. Sacred places focused the collective memory. These were often natural features such as mountains, rivers and springs, and could be provided with additional spiritual impact by the decoration of nearby rocks with petroglyphs. Here the shamans would communicate with the gods and with the spirits of the ancestors through the use of special objects and substances. Human sacrifices were also performed at such sacred places. The remarkably well-preserved frozen body of a young girl aged about 14 years – the so-called ‘Lady of Ampato’ – was discovered in 1995 near Arequipa, on Mount Ampato in the Andes Cordillera. She had been killed between AD 1440-1450 and, together with sculptures and foodstuffs, she had been offered to the Inca gods.

The most spectacular ritual landmarks from ancient Peru were those produced by the Nazca. In addition to creating beautiful polychrome ceramics and textiles, the Nazca culture is above all famous for the creation of the amazing geoglyphs that criss-cross the Nazca desert (Fig 11). Hundreds of geometric and stylised figural designs were produced by removing the loose red-brown gravel that covers the surface of the desert, exposing the lighter coloured earth below. The Nazca Lines cover an immense area of more than 400 square kilometres, with the geoglyphs produced over a 900 year period spanning 200 BC - AD 700. The Nazca peoples were spread over a vast territory running along the dry southern coast of Peru. The culture appears to have been extremely theocratic in nature and had as its ceremonial centre a huge non-urban temple complex at Cahuachi, covering an area of 24 square kilometres. At this ceremonial site large-scale rituals were performed, including processions of mumified bodies of ancestors.

Most of the civilisations of South America practised human sacrifice, and this unpleasant association with the societies that produced the artworks currently on display at Brescia can lead to uncomfortable questions of how such exhibitions should be staged, and how visitors should approach them. Archaeological work at the pyramids erected by the Moche culture (AD 100-800) in northern Peru proves that they sacrificed males, probably warriors from enemy states who had been captured in battle. The later Inca civilisation maintained ritual sacrifice as an integral part of religious observance. On the death of Atahualpa’s father, Huayna Capac, in 1527, Nigel Davies believes that as many as 4000 slaves, servants, officials, and concubines were sacrificed in the Emperor’s honour (Human Sacrifice, 1981). Such sacrifices are glimpsed in the archaeological record and only last year 33 bodies dating to the decades before the collapse of the Inca Empire were found near the Peruvian coastal city of Chiclayo. Most were bodies of teenage girls, some still bearing cut marks on the neck and collarbone where the sacrificial blade had been drawn across their throats. There is thus a moral dilemma in appreciating the beautifully fashioned artefacts and the skills of the artisans who produced them, and the cruel and bloody context within which such artworks were created.

Empire of the sun

The Inca Empire, also known as the Tahuantinsuyo, evolved...
over many centuries, but its origins are still subject to scholarly debate. Foundation myths speak of a hypothetical first ruler, Manco Capac, emerging from the waters of Lake Titicaca holding a golden rod and gesturing towards the chosen location on which the sacred city of Cuzco would be built. By AD 1500, the theocratic Inca Empire stretched from the Pacific Ocean in the west to the rivers of the Amazon and Paraguay in the east; and from the region near Quito in modern Ecuador to the north, to Chile's Maule River in the south (Fig 12).

The capital of the Inca domains was the city of Cuzco. Like the uniquely located sacred site of Machu Picchu (Fig 8), it boasted impressive palaces, temples and astronomical observatories. The largest and most important of the temples in the city was that of the Coricancha – the Golden Courtyard – dedicated to Intí, the god of the sun. It was filled with a staggering quantity of gold statuary, while floors and walls were covered in sheets of gold. While the Inca Empire was already in decline because of the civil war fought between rivals vying for the throne, it was the arrival of the Conquistadores under Francisco Pizzaro in 1532 that would lead to the destruction of Inca civilisation. Following the capture of the last Inca king, Atahualpa, the Spanish demanded that an entire room be filled with objects of gold and two other rooms with silver, for the ransom of the king. Most of the precious metals that went into the futile attempt to free Atahualpa were probably obtained by stripping the Coricancha. The Spanish subsequently melted the objects into ingots for ease of transport back to Europe. The imprisonment and murder of Atahualpa by order of Francisco Pizarro is most famously and movingly portrayed in Peter Shaffer's 1964 play, *The Royal Hunt of the Sun*.

**Italian intervention**

The exhibition catalogue, edited by Paloma Carcedo de Mufarech, includes two chapters on the investigations carried out by Italian scholars in Peru in the years following the founding of the Museo Preistorico Etnografico in Rome by Luigi Pigorini in 1875. Among the pioneers of Peruvian archaeology was the Italian naturalist and geographer Antonio Raimondi, who published *El Perú. Historia y Geografía del Perú* in 1874.

In 1962, an official agreement was signed between Italy and Peru. This allowed for an Italian archaeological mission in the country, financed by the Ministry of Foreign Affairs and led by Pellegrino Claudio Sestieri. Until 1971, the Italian mission concentrated its activities on the site of Cajamarquilla, a large city built on the banks of the River Rimac, near Lima. Located between the mountains and the coast, Cajamarquilla was spread over more than seven square kilometres and had a population numbering about 20,000 at its peak in the 8th and 9th centuries AD. The archaeological work of Sestieri was continued by Mario Polia and Claudio Cavatrunci who explored the extensive network of Inca roads in the Aypate region of north-west Peru, and in 1973 they discovered a fortress city buried under thick vegetation at a height of almost 3000m above sea level. This was followed in 1982 by the Nazca Project and the construction of the Museo Didáctico Antonini at the site following a private bequest of the Antonini family. Political unrest at the end of the 1980s directed the Italian investigations towards the safer regions of the valley of the river Tambo, south-west of Lake Titicaca. Italian archaeologists are currently investigating the coastal city of Chan Chan, capital of the Chimú kingdom (AD 1200-1470). Italian funding also made it possible to open the Museo de Sitio at the site of Sipán, on Peru's northern coast. The museum protects the richest tomb ever discovered in South America, which was unearthed in 1987. These Italian archaeological missions have also attempted to involve the local population in their activities and improve living conditions while opening remote areas to tourism.

**Catalogue:** *Inca, origine e mysteri delle civiltà dell’oro*, edited by Palma Carcerde de Mufarech. All colour illustrations. Marsilio, Venice, 240pp. €30 at the exhibition, €38 in bookshops. Information and bookings: +39 (0) 800 775 083.

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Fig 12. Map of the Inca Empire and the network of Inca roads.
2010 marks the 50th anniversary of the building of the Aswan High Dam. Georgina Read evaluates its impact on Egypt’s archaeology

High stakes

Since construction commenced 50 years ago, the Aswan High Dam (Saad el Ali) has illustrated the tension between protecting a country’s archaeological heritage and serving the contemporary needs of its people. Every nation is faced with the challenge of balancing its ancient cultural heritage with the capacity of its people to prosper. It is interesting to consider with hindsight the effects of such a large-scale, and at the time, controversial construction on the ecology and archaeology of its surrounding area.

The original Aswan Dam, built by the British in 1902, was erected and heightened three times (in 1912, 1929, and 1933), but still failed to provide the necessary control against the flooding of the Nile Valley. The dam also lacked capacity, unable to provide sufficient electricity for the growing population, or irrigation to support the booming cotton industry. The solution was to build a dam to control the variance in the Nile’s water supply, to help meet some of the demands of the country’s population and industry, the dam would also alleviate the widespread flooding of the Nile Valley from June to August, which devastated cotton crops and damaged residential areas. By 1960, Egypt’s population had grown rapidly to over 28 million and President Gamal Abdel Nasser (Fig 7) saw the construction of a new dam as essential to the country’s economic development and political stability.

The project was eventually funded by the Soviet Union after Western countries withdrew their support owing to the perceived socialist reform agenda being pursued by Nasser’s government. Egypt and Sudan had signed the Nile Water Agreement in 1959 and work began on the dam the following year and, after several stages of construction, was completed in 1972. A total of 35,000 workers were employed in building the dam, the greatest building programme in Egypt since the construction of the pyramids.

A dam of this size was always going to have a huge impact on the ecology and archaeology of the area. It was estimated that in the region of 100,000 people were permanently displaced from Nubia by the rising waters of Lake Nasser, the vast reservoir that was formed behind the dam capable of holding 111 cubic kilometres of water (Fig 3). The construction of the dam would also have a huge impact on the people of Egypt living far to the north. Some 95 percent of the population of the country lived within 20 kilometres of the River Nile, many working as farmers and reliant upon the annual floods to deposit nutrient-rich silt on the land. With the building of the dam this material would instead end up at the bottom of the reservoir, necessitating the widespread use of artificial fertilisers to enrich the farmland lying either side of the Nile. The steady build-up of silt behind the dam would also steadily decrease the capacity of the reservoir. Furthermore, the relatively calm waters of Lake Nasser proved to be the ideal environment for water snails which carry the Bilharzia parasite which can cause serious damage to the internal organs of anyone who contracts the disease from infected water, leading to chronic illness and sometimes death.

The threat to Egypt’s heritage posed by the construction of the dam and the creation of the vast reservoir behind prompted an international outcry, UNESCO’s ‘Nubia Campaign’...
mobilised funds to ensure the relocation of 22 monuments and architectural complexes, saving them from the rising waters of Lake Nasser. The international effort was carried out with the assistance of 40 technical missions drawn from five continents. This provided the expertise that allowed the dismantling and accurate reassembly of the huge and complex structures.

Not only were monuments moved to new sites, some were even relocated to new countries. The Temple of Debod (Fig 2), originally constructed at the beginning of the 2nd century BC and added to by the Ptolemaic kings, was dismantled and shipped to Spain where it was rebuilt in the Parque de Rosales in Madrid. (The gateways of the temple have, however, been reassembled differently to the order in which they originally stood when 14km south of Aswan.) The Temple of Dendur, which had been erected by Petronius, the Governor of the Roman province of Egypt at the beginning of the Roman Principate, originally stood some 75km south of Aswan where it faced submergence under the waters of Lake Nasser. The temple was therefore presented as a gift by the Egyptians to the United States of America and was shipped across the Atlantic and reerected in the Metropolitan Museum of Art, New York (Fig 4).

Even monuments not originally thought to be at risk from the rising water levels, including some of the structures that were relocated as part of the international effort, have since come under threat from salination. The rising water table that inevitably resulted from the creation of the huge reservoir, has released salts into the sandstone and limestone of monuments all across Egypt, leading to flaking of external reliefs and hieroglyphs, while also weakening the stone, resulting in the crumbling of some structures.

The largest and most famous of the monuments relocated in the 1960s was the twin temple site at Abu Simbel (Fig 6). Originally built in the mid-1240s, with construction running for more than 20 years, the impressive main temple, dedicated to the four universal gods – Re-Harakhte, Amun-Re, Ptah, and Ramses II – has a facade 30 metres high, 35 metres wide, and with four seated statues almost 20 metres high, all wearing the Double Crown. The statues are taller than the Colossi of Memnon at Thebes, and were all originally carved from the solid cliff face. Since its discovery in 1813 by the famous Swiss orientalist J.L. Burckhardt, Abu Simbel has been one of the most popular tourist attractions in Egypt. Not only is it a magnificent example of monumental Egyptian craftsmanship, but the Temple of Nefertari, one of the two Great Royal Wives of the pharaoh, is the only example from Egyptian history in which the queen was carved to the same size as the pharaoh, signalling her as his equal. Over four years (1964-68), and at a total cost of $40 million, engineers and archaeologists dismantled the colossal temples of Ramses II and Nefertari, reassembling them 90m above and 120m to the north of the original location. What was once a mysterious, partly sand-submerged temple is now a lake-side tourist hotspot.

Also included in the UNESCO relocation project was the spectacular Philae Temple complex (Figs 5, 8), which had formerly been located on an island dedicated to Isis. Revered for centuries, the island witnessed most phases of temple construction during the Late Period of Pharaonic history, and especially during Ptolemaic and Roman control of Egypt. However, following construction of the Aswan Low Dam, the temples on Philae were partly submerged for many months of the year. Before the 27,000 tons of stone which made up the temple complex on the island could be relocated in the face of the higher water levels that would follow the building of the High Dam in 1960, Philae was protected with a
coffer dam constructed around the site and which allowed the monuments to be thoroughly dismantled.

At the same time, attention was paid to landscaping the site to which the monuments would be relocated. The original setting of Philae was therefore replicated on Agilkia Island, a little over half a kilometre away (Fig 8). The various shrines, sanctuaries, colonnades, and huge pylons which constitute the magnificent site were carefully dismantled before being relocated, a process that took more than two years to complete.

The creation of the Aswan High Dam is not a unique example of the way in which large-scale reservoir projects can threaten a country’s cultural heritage. Similar programmes of construction are still a threat, and many lessons are still to be learned from the experiences that accompanied the building of the High Dam.

In Turkey, the creation of the Ilisu Dam, part of a network of reservoirs in south-eastern Anatolia, is due for completion in 2013. The massive construction project has been prompted by the same motivations as those which led to the building of the Aswan High Dam 50 years earlier: power is needed for the country’s industries, and irrigation is required for the farmland. The project also promises increased employment prospects for the population of the region, offering greater prosperity and reduced political instability. However, in the same way that the Aswan Dam drowned so much of the heritage of ancient Egypt, and threatening many important monuments and architectural treasures, so the ancient town of Hasankeyf, which dates back almost four millennia, also faces drowning beneath the waters of the Tigris if the Ilisu Reservoir project goes ahead. The dam also threatens to destroy as many as 80 towns and villages, and force the relocation of between 50,000 to 80,000 people. Countries like Egypt and Turkey have been bequeathed an incalculably rich legacy from the ancient past, but lack the modern financial resources to preserve it. Industrial and economic development therefore usually takes precedence over conserving heritage. While tourist dollars provide an increasingly lucrative source of revenue in the economies of such countries, such income will only continue for as long as the monuments and archaeological sites are visible. It therefore falls to the international community and bodies like UNESCO to intervene, and, where possible, ensure that these treasures are preserved for future generations.

The Aswan High Dam in numbers
- The Aswan High Dam is 3,830m long, 980m wide at the base, 40m wide at the crest, and 111m tall.
- It contains 43 million cubic metres of material.
- 11,000 cubic metres of water can pass through the dam every second.
- There are emergency spillways for an extra 5000 cubic metres per second.
- Lake Nasser is 550km long and 35km at its widest point with a surface area of 5,250 square kilometres. It holds 111 cubic kilometres of water.
- Lake Nasser is one of the main tourist attractions on the River Nile. The dam wall, a vast barrier of concrete overlooking the Sudanese and Nubian borders, merits the same level of visits as the ancient temples that were once sited there.

Fig 5. Trajan’s Kiosk (‘Pharaoh’s Bed’), built by the Roman emperor (r. AD 98-117) as part of the Philae temple complex. With construction of the Aswan Low Dam in 1902, the structure, like the other monuments on Philae, was partly submerged for much of the year.

Fig 6. The relocated façade of the main temple of Abu Simbel, dedicated to Re-Harakhte, Amun-Re, Ptah, and Ramses II. 1240s – 1220s BC.

Fig 7. Gamal Abdel Nasser (1918-1970). As President of Egypt, from 1956 until his death, Nasser was instrumental in pushing through the development and construction of the Aswan High Dam.

Fig 8. Trajan’s Kiosk relocated on Agilkia Island, viewed from the waters of Lake Nasser.
Andrew Wallace-Hadrill’s fascination with the ancient world began in his teenage years when his father, the eminent medieval historian John Michael Wallace-Hadrill, introduced him to Gibbon’s *Decline and Fall of the Roman Empire*. ‘I absolutely loved it,’ he remembers. ‘While you do get the personalities coming through, above all else Gibbon gives you the long drive of history: the idea of a Roman world endlessly transforming itself and of antiquity moving into the Middle Ages.’

With the British general election rapidly approaching at the time of our interview, Prof Wallace-Hadrill is quick to express concern whenever political leaders draw parallels with their ancient predecessors. ‘I tend to feel that modern politicians often like reading lessons from the past and applying them to the present. By contrast, I’m more aware of the enormous gulf that separates the ancient world from that of the modern. I personally feel a sense of frustration with earlier generations of ancient historians who, in order to serve as a model for the British Empire, tried to turn the Roman Empire into a smoothly operating bureaucratic machine, when it was nothing of the sort. I’m therefore much happier focusing on emperors like Caligula and Nero and the corruption, incompetence, and madness, and how people coped with that,’ he says.

‘Although the Romans produced an imperial system that sustained itself for 400 years—an outstanding achievement for such a geographically and culturally diverse area—that does not mean the Romans got things right, or that we should follow their example. The Romans certainly had to deal with some of the same problems that currently face modern societies, such as immigration and cultural integration. However, while there are some similar underlying forces, they’re not the same because history is specific and we are in a very different place and time from the ancient Romans.’

Rather than a foundation on which modern society is based, Prof Wallace-Hadrill prefers to see the past as a mirror in which we can look at ourselves. ‘While there are points of similarity, it allows us to reflect on what makes the modern world so different. If we just looked at the past and found a reproduction of the present, then it would be incredibly boring. It is the combination of the differences and similarities that makes civilisations like that of Rome so interesting to us today.’

Although Prof Wallace-Hadrill is best known for his work at the archaeological sites of Pompeii and Herculaneum, he does not regard himself primarily as an archaeologist. ‘I am an ancient historian, that is what I trained as. I have therefore recently carried out socio-political work on the functioning of the Roman Imperial court, and been looking at how imperial politics was very different to the modern political systems with which we are familiar today. It is, however, tedious to limit one’s activities to the initial area of your training, and I’m certainly going to interest myself in neighbouring disciplines. I’m therefore still concentrating on archaeological work at Herculaneum at the moment.

Although we are slowly beginning to build up a picture of what the city was like, and we now have a good idea of what the sea-front section of the site looked like, there is still so much that we don’t understand about the town. It’s far too easy to focus on what we do know and forget about all the blanks that remain in our knowledge. One of the big unknowns is where is the town’s forum? It should be such an obvious thing, occupying a large area in the middle of the site as it would in all other Roman settlements, except that in Herculaneum, we simply cannot find it, and we don’t really know quite where to look for it!’

This and other unanswered questions mean that there is still much work to be done at Herculaneum and elsewhere on the Bay of Naples.
Naples, and Prof Wallace-Hadrill regularly returns to the site. 'I never quite lose touch with either the sunshine or with a good bowl of pasta! One thing I love about working at both Herculaneum and Pompeii is that there are an unbelievable number of new angles you can turn up on such well known sites. During our work at Pompeii, Mike Fulford [University of Reading] discovered remains of the 6th century BC, and to find archaic material was quite extraordinary because we had felt confident that the occupation of that area of the site only went back to the 3rd century BC.

'I'm particularly keen on the work currently being done by Prof Mark Robinson from Oxford University. While he's an environmental archaeologist looking particularly at the contents of sewers, he kept on noticing that there was much older evidence from a prehistoric Pompeii, and he has pushed activity at the site well back into the 3rd millennium BC. It's fantastic how much more we still have to learn about the prehistory of Pompeii. That is not to say we are going to stop studying the Roman settlement that came to a dramatic end in AD 79, but that's not all there is. I like the intellectual adventure and the excitement of realising that, just when you thought you knew what the story was, you suddenly realise there is a whole new part of it that you hadn't been looking at. Of course archaeologists should seek to answer questions, but at the same time they should be prepared for surprises.'

Prof Wallace-Hadrill also remains as Director of the Herculaneum Project, which is very much focused on the conservation of the ancient town. The project is currently reaching the end of the 'primary conservation' phase, which has concentrated on basics such as removing water from the site and re-roofing some of the surviving ancient structures. Conservation has also been central to his work in Pompeii, and he believes that young archaeologists should receive better training in the importance of conservation.

When we started our project in Pompeii in 1995, we deliberately set out a programme that did not involve further excavation, but which looked more deeply at what had already been excavated. Large-scale excavation further magnifies the problems of conservation, and there is still so much that needs to be examined without the need for new digging; instead we should be looking after what has already been found. It is scandalous to spend millions on new excavations when we already need millions to preserve the fantastic buildings and artefacts that have previously been excavated. Excavation undertaken without consideration or conservation simply creates a massive problem for the future.

'I'm not saying there should be no excavation, indeed the conservation of the site itself demands some excavation. When we were attempting to provide better drainage for Pompeii, we cleared an ancient system of sewers which offered the best means of getting water away from the site. However, to do so we had to excavate through a large ancient cesspit. We dug it away precisely to provide a route for water but we obviously could not simply leave it to degrade and so it had to be properly excavated. It was conservation leading to excavation, and it yielded hugely important information about the nature of the ancient diet.'

Herculaneum is often regarded as a resort town for the elite of Roman society, but Prof Wallace-Hadrill is unhappy with this interpretation. 'There are some interesting ways in which Herculaneum is “posher” than Pompeii. The use of decorative marble in the walling and flooring creates a clear impression that there is an extra level of luxury in the town that is not quite reached in Pompeii. But there are also the remains of blocks of flats constructed from...
brick and concrete which rise up to four or five storeys – just like those found at Rome or Ostia – undoubtedly where lots of less well-off people lived. An inscription found in the town, which has fragments of 500 names preserved, while there were at least another 500 on missing parts, was also probably a list of the Roman citizens resident in Herculaneum. Of the names that do survive, about two-thirds are those of former slaves – a strong indication that this was not just a town for the upper classes.

As a result of his frequent appearances on television, Prof Wallace-Hadrill has become one of Britain’s best known academics. It is a role with which he has something of a love-hate relationship. ‘I have greatly enjoyed doing TV documentaries,’ he says. ‘I feel it’s important to communicate the importance and enjoyment of our subject more widely, and questions and feedback from the general public have enriched my own understanding. I do, however, find the editing process for television massively frustrating, especially when something you have said on camera gets placed in a different context. Yet there’s absolutely nothing an academic can do to protect oneself against this, and I’ve therefore just resigned myself to it happening.

‘I am, however, tired of doing the same thing again and again. There was a recent obsession with gladiators, that started with the release of the Hollywood film, and I appeared on at least five different documentaries that all asked me to go and stand in the Colosseum and say something dumb about ancient gladiators! I’m far more enthusiastic when talking about recent work that really does contribute something new to our understanding of the ancient world.’

He does, however, take a positive view of recent television depictions featuring the eruption of Vesuvius and the destruction of Pompeii and Herculaneum. ‘Such programmes are wonderful. Whether they focus on plaster casts of dead people killed in the eruption; the cartwheel tracks running through the streets; the wonderfully preserved frescoes which decorate the rooms of the ancient houses; the tiny details such as looking at how the ancient doors worked, or the magnificence of public buildings like the amphitheatre; the site presents ancient life before our modern eyes. Your imagination has to be seriously impaired not to be transported at least a little into the Roman world.

Another effect of programmes like these is to inspire viewers to book a flight and see the sites for themselves. Which would Prof Wallace-Hadrill urge Minerva readers to visit? ‘It’s often very frustrating to tell people of the hidden gems of Pompeii because the general visitor won’t be able to see them. For example, the House of Fabius Rufus on the western edge of the site, which was excavated in the 1960s and 70s, is still not available to the public. However, the House of the Chaste Lovers has recently been opened to visitors as a chance to watch an excavation in progress. The great hope is that, in time, many more of the buildings will open to the public. But I would urge people to look outside Pompeii. Only about a tenth of the visitors who go to Pompeii visit Herculaneum, a town that is every bit as interesting. But there are also other fascinating and enormously rewarding archaeological sites nearby – the Villa of Oplontis; the three fabulous Roman villas at Stabiae, or the Villa Boscoreale, which provides visitors with a chance to see a working Roman farmstead in action.’

Recent natural disasters, such as the earthquakes in Haiti or Chile, or the tsunami which raced across the Indian Ocean in 2004, have also sparked renewed interest in sites like Pompeii and Herculaneum, reminding people of the disaster that befell both settlements in AD 79. Prof Wallace-Hadrill believes that our awareness of the impact of natural disasters makes the consideration of one specific historic catastrophe all the more awesome, and serves to emphasise the destructive impact of these events. ‘While scholars have tended to focus on the volcanic eruption of Vesuvius in AD 79, we now know that the Bay of Naples was subject to very serious earthquakes in the run-up to the eruption and the population of the area was therefore constantly living with catastrophe. Of course it’s only a matter of time before Vesuvius erupts again. But it’s completely unpredictable and when it next happens, we don’t know the scale or the type of eruption it will be. If there’s a major eruption that flows over Naples then it may prove to be a major human catastrophe. However, when I think of the volcano I regard it more with fascination than fear and I very much hope I am in the area when Vesuvius next erupts to have the chance to see such a spectacular and fascinating event. ■

For further information on the work of the British School at Rome, see www.bsr.ac.uk
For more details on Sidney Sussex College, Cambridge, see www.sid.cam.ac.uk/
Numismatic sales

International dealers and collectors gathered for the 38th New York International Numismatic Annual Convention staged on 3-10 January, and David Miller reviews some of the notable coins that went under the hammer.

Triton

The largest of the eight sales held during the convention was the Classical Numismatic Group’s Triton sale on 5-6 January. This consisted of 2257 lots, of which the great majority were ancient coins struck by the Greeks, Romans, and Byzantines, along with others of contemporary civilisations such as the Celts, the Indian kingdoms of the Guptas and Kushans, and the Empire of the Persians. The remaining 371 lots covered European coins from the 6th century AD through to the Victorian period.

A silver tetradrachm of Katane in Sicily, showing a facing head of Apollo and signed by the die engraver Herakleidas, was struck around 405 BC (Fig 1). Considered among the finest examples of Greek numismatic art, this particular coin is one of the best specimens to have come on the market and fetched double the estimate at $60,000. A slightly earlier Sicilian piece, a silver drachm of Naxos, also went for slightly more than twice the estimate fetching $65,000 (Fig 2). The obverse of the coin portrays an ivy-wreathed and bearded Dionysos, while on the reverse his drunken companion Silenos squats, gazing pensively into his wine cup, hoping for a refill. This wonderful little coin has a provenance dating back to 1859, when it was sold in London by Sotheby’s as part of Lord Northwick’s collection.

As one of the most famous women in history, coins depicting Cleopatra VII of Egypt (r. 51-30 BC) always inspire interest. An extremely rare bronze coin found at Paphos in Cyprus (the island had recently been restored to the Egyptian throne by Cleopatra’s lover, Julius Caesar) fetched $10,000 against the estimate of $3000 (Fig 3). The coin depicts Cleopatra in the guise of Aphrodite, holding Caesarion, her son by the Roman warlord, the infant portrayed as Cupid. Whereas Cleopatra and Caesarion perished in 30 BC following the defeat of Egyptian...
forces at the Battle of Actium, the daughter of Cleopatra and Antony, Cleopatra Selene (c. 40-6 BC), survived and was taken back to Rome, eventually marrying Juba II of Mauretania (c. 52-23 BC). A very rare denarius struck by her husband shows her diademed portrait on the reverse with her husband on the obverse (Fig 4). In extremely fine condition, this coin depicting a little-known daughter of an internationally famous mother, was estimated at $1000 and sold for $5000.

Julius Caesar was also represented in his own right in the Triton sale. Described as the finest known portrait denarius of Julius Caesar, lot 291 shows a bust of the Roman general wearing a wreath within a border of pellets (Fig 5). Within 18 months of his assassination in March 44 BC, the coin was struck by a supporter of Caesar's young grand-nephew Octavian, to help legitimise his claim to be the dictator's true heir. The reverse shows a standing figure of Venus, from whom the family of Caesar claimed to be descended. This magnificent coin went from a starting estimate of $75,000 to a record bid of $160,000.

Towards the end of the Roman Empire, Magnus Maximus, the commander of the armies in Britain, proclaimed himself emperor and, seizing power in AD 383, he re-opened the mint of London to strike new coins in his own image. The mint was only in operation for a few months before Maximus took himself out some highly important pieces. It consisted of 470 lots of ancient coins and ten lots of medieval coins, most of which were of very high quality pieces.

An example of this was a pentadrachm of Berenice II (c. 266-221 BC) (Fig 8). Struck in Alexandria, the coin depicts the veiled head of the queen looking right, while the reverse features a cornucopia surrounded by her name and title. The condition of the coin was exceptionally good and it fetched just under estimate at $52,000.

A large section of the sale consisted of the collection of Aloysius Lynn. Consisting primarily of Roman Imperial silver and gold coins of high quality, there was predictably strong bidding. An aureus of Vespasian (r. AD 69-79) fetched $20,000 (Fig 9). Struck in Rome in AD 76, the gold coin shows Aeternitas, the personification of Stability, holding the heads of the Sun and Moon. An extremely fine denarius of Augustus, showing the comet that foretold the death of Caesar, made $10,250 against an estimate of $6000. A solidus of the short-reigned emperor Constantius III (r. AD 421) saw brisk bidding (Fig 10). Constantius had been made co-emperor of the Western Empire by his brother-in-law, the emperor Honorius (r. AD 393-395). This move drew the enmity of the Eastern Emperor, Theodosius II (r. AD 408-450), who threatened war. However, before hostilities could break out, Constantius conveniently died of natural causes. This rare specimen from Ravenna fetched $67,000.

Overall the Freeman & Sear’s auction made more than $1,600,000, including the 18 percent premium, with only 5 percent of the lots remaining unsold.

**Triton**

**Freeman & Sear**

The London firm of A.H. Baldwin & Son, in conjunction with Dimitry Markov of New York and M & M Numismatics of Washington, combined to produce the New York Sale on the evenings of 6 and 7 January. Alongside Greek, Roman, and Byzantine coins, there was also a group of Islamic and Indian coins, as well as a selection of nearly 300 lots of medieval European and world coins, altogether totalling 758 lots. The cover coin was a sestertius struck in the reign of Tiberius (AD 14-37) showing a winged caduceus between two cornucopias surrounded by the heads of the emperors' twin grandsons, Gemellus and Germanicus (Fig 11). The reverse carries the name and titles of their father Drusus, who became heir apparent to his father Tiberius in AD 22, when the coin was minted. But within a year, Drusus had been poisoned, an act committed by his wife Livilla and her lover, the Praetorian prefect Sejanus, if the historian Tacitus is to be believed (Annals, 4.7-8). Of the twins, Germanicus was dead before his fifth birthday, and his brother was executed in the first year of his cousin Caligula's reign (r. AD 37-41). This souvenir of a doomed dynasty is one of the most beautiful coins of the Roman Empire. Hotly contested, it fetched $15,000 against an estimate of $8500.

As already mentioned, Roman gold coins are extremely popular at the moment. An aureus of Nero (r. AD 54-68), struck in Rome around AD 64, with the reverse of an enthroned Salus, goddess of health, made nearly three times its estimate at $16,000 (Fig 12). From the late Empire,
On the last day of the convention, 10 January, the Gemini sale was held. As the name implies, the sale was originally the joint effort of two dealers, but now there are three: Harlan Berk of Chicago; Herb Kreindler of Melville, New York; and David Hendin, author and dealer in Jewish coins. Between them they put together a most interesting sale drawn from a number of sources, which included an impressive group of Jewish and Palestinian issues, mainly from the collection of Dr Stephen Gerson and duplicates from Boston Museum of Fine Arts and the American Numismatic Society in New York. Prices were fairly strong, although a few major items failed to sell and others were somewhat below estimate. Examples of this were lot 14, a truly beautiful Akragas tetradrachm, estimated at $110,000 but knocked down for $88,000 (Fig 15), and another silver tetradrachm of Naxos in Sicily, struck in 410 BC, which went for $100,000 – $25,000 below the estimate (Fig 16).

However, many other pieces did exceptionally well. The Year Five shekel – of which only 24 exist – depicts a pearled, rimmed cup with a palaeo-Hebrew inscription ('Shekel of Israel'), with a reverse proclaiming 'Jerusalem the Holy' around a stem of three pomegranates (Fig 17). These coins were struck in AD 70 during the final days of the Roman siege commanded by the future emperor Titus (r. AD 79-81), which had invested Jerusalem on 21 March and would continue until the city finally fell to the Romans on 4 August. The Jewish authorities continued to strike silver shekels dated from the beginning of the revolt five years before. This rare and important coin fetched $85,000 against an estimate of $65,000. A Roman gold solidus of Licinius II, who ruled as Caesar of the Eastern Empire from AD 317-324 achieved a high price. Struck at Nicomedia in AD 320, the coin shows a bust of a young boy, bare-headed and wearing a cuirass while staring directly ahead (Fig 18). Facing portraits of Roman emperors were rare until this point, but this issue began what was to be a popular type in the Late Roman and Byzantine periods. In mint condition, the aureus made nearly double its estimate at $37,000.

Finally, from the Dr John Gullick collection, a silver penny of Alfred the Great (r. AD 871-899) made $24,000, well above its estimate of $15,000 (Fig 19). Struck at London, it shows a portrait bust of the Anglo-Saxon king, while on the reverse is the monogram of ‘Londonia’. The Gemini sales made a total of $2,883,703.
Ancient Canaan and Israel. An Introduction
Jonathan M. Golden
Oxford University Press, 2009. 411pp. 87 b/w illus.

First published in hardback in 2004, this is an intriguing book that tackles the thorny issues of Biblical Archaeology. In the preface the author observes that modern politics play a major role in shaping perceptions of the past, so it is curious that the modern geopolitical situation in the region is not mentioned. The circumvention of this reality is more implicit of the objective nature of this book.

The author's discourse on monotheism. Generally associated in the region corresponding to ancient Israel and the modern Palestinian Territories with the worship of the single god YHWH (‘Yahweh’) – compelling evidence for polytheism is assessed. This is gleaned from passages in the Old Testament that refer to Baal, Anat, and El, extra-biblical inscriptions, and archaeological finds (a painted ewer from Lachish; a representation of the goddess Asherah depicting pregnancy and Asherah figurines’) that suggest Asherah may have been the consort of YHWH from Samaria; ‘Asherah figurines’) that suggest Asherah may have been the consort of YHWH at a relatively late period in Israelite history (7th century BC).

Of fundamental interest is the extent to which people, places, and events described in the Old Testament can be borne out by archaeological evidence. This is especially the case with the biblical account of the Exodus, which is difficult to relate to physical remains in the manner described in 1 Kings (6:1) as a broad and swift conquest. Theories discussed here range from the latter, as suggested by what W.F. Albright (1939), G.E. Wright (1961), and Y. Yadin (1979) construed as destruction levels from the presumed time of Joshua’s conquest; to the more gradual and peaceful infiltration of Israelites in the region based on the work of Y. Aharoni (1957). Whatever the truth, it is pointed out that archaeological evidence does indicate that the Israelites were established in the highlands of the region by the 10th century BC.

As may be expected, Golden also grapples with the conundrum of the ‘United Monarchy’ – the Israelite Kingdom of Saul, David, and Solomon as attested in the Old Testament. An important aspect of this is that in 1 Kings (9:15, 17-18), Solomon is credited with major construction projects at several urban locations such as Baalath, Beth Horon, Megiddo and elsewhere, but radiocarbon evidence places the inauguration of these sites to a later period. This is tempered with fascinating evidence from inscriptions attesting to the existence of David, including the Dan Inscription and the ‘Mesha Stele’. It is sensibly concluded that although much of the archaeological evidence demonstrates that the Hebrew Bible cannot in most cases be taken literally, many of the people, places, and things probably did exist at some time or another.

This is an engaging book that provides a lucid overview of a fascinating period in a region characterised by a time depth of turbulence. It is a shame that many of the illustrations are of low quality but this should not detract from the way this complex history has been woven together into a skilful tapestry of understanding.

Dr Mark Merrony

The Making of Bronze Age Eurasia
Philip L. Kohl
Cambridge University Press, 2009, 320pp. 120 b/w illus.
Paperback £18.99

This book – now available in paperback – will serve as a sourcebook for archaeologists interested in the region for the foreseeable future. An impressive array of evidence has been fused into a synthetic whole that generates a huge number of questions and provides an excellent platform for future research. Although the book is well illustrated with finds of various kinds, it is not a typological description of material culture. The particular methodology, as stated by the author, is post-processual archaeology. To this reviewer, the term post-processual raises alarm bells, but there are only a few areas where this approach appears constraining. The question of ethnicity is not addressed. As the author states: ‘Quests to make such identifications have a sorry and, at times, even dangerous history. From the perspective adopted in this study, the archaeology of ethnicity is a mistaken enterprise; indeed the term itself is an oxymoron.’ (p. 19). It is the study of the Indo-Europeans that faces particular hurdles. It is somewhat disconcerting that there is no discussion, even at a basic level, of skeletal evidence. Surely a sober and scientific discussion of Indo-Europeans is possible in an era when National Socialism is long dead?

The author also makes it clear that technological innovation should be appreciated in light of the diffusion of ideas. When discussing the metalworking practices of the 5th millennium BC in the Carpathian-Balkan region, he states: ‘If one anachronistically wishes to accord Europe due credit for these innovations, then one can consider the development of copper-based metallurgy in south-eastern Europe as an indigenous process – though with its roots firmly planted in the early agricultural soil of Anatolia.’ (p. 31). Sadly the book is not long...
volume as it had been completed in advance of the other three.

The book opens with 'Methods of identifying the Royal Mummies' and covers the pose of the bodies, mummification techniques, X-rays and age at death. The latter section particularly addresses the given estimated ages and, by reference to the London Spitalfields Project, suggests that the use of standard anatomical methods would indicate that mature individuals might be older than generally thought: 'Thus the Spitalfields Limehouse evidence together with that of present-day, non-Westernised populations, suggests that the age at death estimated by standard anatomical methods probably needs to be raised for royal mummies in all age groups, and by at least ten years for mature individuals. It might also be observed that the privileged few in modern society tend to "wear rather well" and that this was probably equally true of the royal families in ancient Egypt, possibly leading to a still greater discrepancy' (p. 69).

An interesting tabulation of the Royal mummies' estimated ages from Maspero, Smith, and X-rays also reveals sometimes widely variant estimates.

The second major section of the book concerns the question of doubtful identities and the balance of evidence relating to the Royal mummies. It must be remembered that the bodies had been despoiled by robbers, rewrapped by priests who might add an identifying docket to the body, or a note on the bandages, and several were placed in coffins that were not their own. In many instances it has left the field open for positive identification – in fact, Tutankhamen is the sole positively identifiable Royal mummy. Amongst the bodies found in the two Royal caches (Deir el Bahari tomb DB 320 and Valley of the Kings KV 35, the tomb of Amenhotep III) were several that lacked any identification. Speculation regarding their identity, especially concerning the female corpses – possibly Queen Tiy and/or Nefertiti – continues, and none more so than 'Unknown Man E' (from KV 35). There are many theories regarding his identity and death, and all are considered here. There is the mystery of the Ramesses I mummy (from the Niagara Falls Museum, now repatriated to the Luxor Museum) and the evidence against this identification. It is therefore noted that 'Ramesses I has not certainly been identified' in summary it may be said that the mummy that was purchased from the Niagara Falls Museum in 2000, and returned in 2003 to Egypt on the basis that it was Ramesses I, almost certainly is not that pharaoh' (p. 100). Instead there is the 'wry observation' that Ramesses XI falls within the C14 range for this mummy.

This book is hugely useful in that it draws so much of the material and evidence relating to the Royal mummies together in a convenient form, especially the long quotations from original sources that are difficult to come by (or translate). The lists and comparative tables with commentaries on the contents of the two caches, and the detailed comparison of excarnation and evisceration of the New Kingdom royalty are particularly useful. The illustrations are largely taken from Grafton Elliot Smith's publication of The Royal Mummies (1912) and from Georges Daressy's Cercueils des cachettes Royales (1909); although reproduced quite small it is, nevertheless, useful to have them together.

It is obvious that a great deal of research over time has gone into compiling and producing this book, and the follow-up volumes will be of great interest.

Peter A. Clayton

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Rather curiously this book is Part Four of a series where Parts 1 to 3 have yet to appear. The author says that the earlier numbered volumes will follow and they will stand on their own although the whole series will be complementary; subsequent volumes will cover 'Finding the Pharaohs'; 'The Rise and Fall of the Theban Royal Necropolis', and 'Clues from the Caches'. These volumes are promised to follow in order but the author felt it best to present the current

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