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Jerome M. Eisenberg
Editors
Peter Clayton
Barri Joines
Managing Editor
Anna Lethbridge
Contributing Editors
Arnold Sadow
Stavros Asprapoulos
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Verdugo, Suite 2D,
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Tel: (212) 355 2033
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West: Todd Barthold,
332 North Beverly
Drive, Beverly Hills,
California, 90210.
Tel: (213) 550 1198
Fax: (213) 550 1395

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Until now, historians have believed that the Vikings' settlement in Ireland, lasting for over four centuries, was ended in A.D. 1014 when the Nordic invaders were defeated at the Battle of Clontarf by Irish forces. But a new marine discovery extends the period of Viking settlement by nearly half a century, and Irish archaeologists see this as having great historical significance for Europe. The evidence comes from a warship, one of five eleventh-century vessels recovered from Roskilde Fjord, west of Copenhagen, in the 1960s. The two warships, two traders and a fishingboat are all displayed at the Viking Ship Museum in Roskilde city. The warship is 85 feet long, although only about one fifth of the structure remains. Nevertheless, recent tree-ring studies by Danish and Irish archaeologists on the oak of the hull, notably the keel, have shown conclusively that the vessel was made by Vikings in Ireland. The master tree-ring chronologies, the result of research by Michael Baillie who is based at Dublin, show that the warship was made at Woodquay near Dublin, a known Viking settlement. The date of construction was approximately A.D. 1060 (the uncertainty arises because the interval between the felling of the oaks and their use as timber is difficult to determine).

These findings are confirmed by comparative studies on oak from wrecked Viking ships at Woodquay; the Roskilde ship would have had a crew of up to 60 men for the voyage to Denmark.

The five vessels from Roskilde Fjord were deliberately sunk by stone-filling during the twelfth century, to defend Roskilde, which was then Denmark's capital and its main port, from marauding Norwegian Vikings.

The 'Irish' warship is being reconstructed at Roskilde, and is expected to be put on public display this year.

Kenneth Jermy

Israeli officials have announced that the Dead Sea Scrolls, which include some of the earliest known Biblical texts, will be subjected to the carbon-14 dating process for the first time. An Antiquities Authority spokesman, Orna Hess, said the dating would help settle arguments and conflicting theories about whether the scrolls were the product of a Jewish group known as the Essenes or a much later group of early Christians.

Custodian of the Israel Museums Shrine of the Book, Mr Magen Broshi, where some of the scrolls are on public display, said at least 12 of the 799 scrolls would be dated using carbon-14 techniques.

He said that the vast majority of biblical scholars believed the scrolls dated to the second century B.C. or late third century B.C. based on paleography, or analysis of handwriting stylus. 'We relied on paleography. We will now see if this method agrees with physics, and if the two systems correlate,' Mr Broshi said, adding that he believed there would be no dramatic changes in theory as a result of the dating.

Mr Broshi said the testing would quiet critics like Mr Robert Eisenman, who is attacked as a Christian by the non-scientific dating. Mr Eisenman has criticised the present plans for the dating project, saying objective observers should be allowed to witness the process and more than one laboratory should carry out tests. He said this was necessary because the scrolls are controlled by a team of scholars with a vested interest in preserving their theories which are based on the established chronology. 'In order to have a fair process, one that would not be open to future questions, people of differing shades of opinion should be brought into the process as observers', Mr Eisenman said. 'We want to see which fragments are chosen, see them chosen with our own eyes.'

Mr Eisenman has propounded the controversial theory that the unpublished scrolls may be the work of early Palestinian Christians. His argument is based on internal evidence, such as the use of certain phrases known to have been common among early Christians and indirect references to the rule of King Herod the Great.

Traditionally, the scrolls are viewed as the work of a small mysterious sect known as the Essenes. Scholars of the traditional school say they provide an insight into the life and religious thought of the ancient sect of Jews as well as the roots of Christianity.

Source: BIPAC
A team of Japanese archaeologists excavating a royal Egyptian tomb in the Cemetery of the Apes, just to the west of the Valley of the Kings, has discovered a large quantity of fragments of sculpture and funerary equipment that were apparently overlooked or abandoned at the site by Howard Carter. The Archaeological Mission from Waseda University in Tokyo has spent the last six months re-examining and planning the tomb of Amenophis III, who was ruler of Egypt in the early 14th century B.C. The tomb was first examined by Carter in February 1915 during his earlier excavations at Luxor, just a few years before his career was transformed by the discovery of the tomb of Tutankhamun.

Among the objects re-excavated by the Japanese expedition are two yellow faience statuettes of one of Amenophis III’s queens, various fragments of wooden shabtis and coffins, a fragment of glazed floral wall tile (which matches up with a piece brought back to England by Carter) and up to 30 intact pottery vessels. Dr Jiro Kondo, who directed the field work earlier this year, was amazed at the amount of material left in the tomb; ‘We have found many objects from Carter’s dumps, including two wooden labels with hieratic inscriptions, several fragments of statuettes and a wooden model cradle’. Over the next five to six years the Japanese team will mainly be occupied with conserving the deteriorating wall paintings in the tomb, which are affected by the same problem of salt crystals as the tomb of Queen Nefertari, currently being restored by Italian archaeologists.

Only four tombs have so far been found in the western part of the Valley of the Kings, but Dr Kondo is optimistic that his survey will reveal others over the next few years, particularly through the painstaking use of electromagnetic wave radar survey and microgravity measurement. ‘An American team recently found fragments of a sarcophagus from an unrecorded tomb in the area, so we believe that there are still some unexcavated tombs in the western valley. We have also studied many blocks at the entrance to the Valley of the Kings which show how the royal tombs were constructed – we will be looking for similar blocks as clues to the location of unexcavated tombs’.

Unlike European excavators, Japanese archaeologists have been late converts to the study of ancient Egypt, but over the last 20 years the team from Waseda University has surveyed and excavated a number of Egyptian sites (mainly in the area of Luxor and Cairo), often using advanced technology. In 1974 they discovered a unique painted staircase in the palace of Amenophis III, a few kilometres to the south-east of the Valley of the Kings, and since 1980 they have recovered over 200 mummies from private tombs in the Luxor necropolis. In 1987 they used subsurface electromagnetic radar to examine the interior of the Great Pyramid at Giza. The excavation of the tomb of Amenophis III is their fifth archaeological project in Egypt.

Dr Ian Shaw
Chi-Rho Pendant May Be Earliest Clue to Christianity in Britain

A ROMANO-BRITISH silver cross pendant discovered in Somerset may be the earliest evidence of Christianity in Britain. The pendant is inscribed with the Greek letters Chi and Rho, the first two letters of Christ's name and an early Christian symbol. It was found in Shepton Mallet, on the site of a new drinks warehouse, and was lying beneath a skeleton in a coffin from a group of 15 to 20 graves.

Mr Peter Leach, assistant director of Birmingham University Field Archaeology Unit, who is leading the dig, said: 'This unique object was almost certainly made for and worn by a Christian believer buried in the cemetery, presumably among a group of otherwise unidentifiable Christian fellows. The full significance of this important discovery must await further study and expert opinion, but it appears to be the most positive identification yet made in this country of a Romano-Christian burial, which from its style probably dates to the last decades of the fourth century.' This would mean that it predates other evidence of early Christian activity in Britain by 100 years, and belongs to the formative period of Christianity after Constantine the Great decreed it to be the official religion of the Roman Empire.

Dr Warwick Rodwell, consultant archaeologist to the Dean and Chapter of Wells, said that the symbol Chi Rho belonged to the late Roman Christian period. 'This period is a dark age for Christianity because it is something we do not know a lot about. It is an important piece in the jigsaw because it is a Christian object from a grave. Pagan graves are choct-a-bloc with artefacts, but Christians did not consider possessions necessary in the after-life.'

The dig has also uncovered a previously unknown Roman town, now believed to be the second most important Roman town in Somerset after Ilchester. It is believed to have covered 60 acres and to have been founded at the end of the first century AD. The town seems to have been an important centre for pottery manufacture, processing of agricultural products, and metal working, serving the lead and silver mining communities up to ten miles away in the Mendip Hills.

The town was situated on the Fosse Way, which linked 16 towns between Exeter and Lincoln and was one of the most important roads in Roman Britain. It lies two miles south of the point where the lead and silver road from the Mendip mines met the Fosse Way.

MINERVA 4

Staff of the Research Laboratory for Archaeology and the History of Art and of the Institute of Molecular Medicine at Oxford University have announced a novel technique which promises a multitude of archaeological applications.

It has been shown that very small amounts of DNA can survive in human bones. DNA is the highly complex molecule which decides the genetic behaviour of each individual, and so it may well be possible to study the physical and mental characteristics of prehistoric people and races. Isotopic measurements on organic material (including DNA) surviving in bone can yield information on dating and the diet of the individual concerned. But DNA which survives death and burial will become degraded as well as contaminated by other DNA molecules from bacteria and fungi. The crux of the new method is that if two fragments of DNA material survive, it is possible to recognise whether the whole molecule was originally present, and, if it was, to duplicate millions of the original molecules for chemical analysis.

So far, DNA of a recognisable type has been found in bones buried for some thousands of years. The immediate research programme of the Laboratory will concentrate on DNA studies for determining the sex of bones; identifying next-of-kin; showing population differences, e.g. between Roman Britons and Anglo-Saxons; and following selective breeding of sheep. It will examine how far back into prehistory the DNA technique can be used. Common genetic defects, like the extent of colour-blindness, will also be examined.

In later years, when more information on DNA variations in humans becomes available, the Laboratory will look at more fundamental questions, such as the abilities of early humans, movements of ancient races and migrations between regions, and the sizes of populations.

K.E. Jermy
Bronze Age Gold Torc
Found by Treasure Hunter

A TREASURE HUNTER using a metal detector in a field in Wiltshire, south west England, has discovered a perfectly preserved bronze age necklace. The torc, which has a 14 inch circumference, is composed of three spirally-twisted strands of gold with club-shaped terminals at either end. Preliminary investigation dates it to about 1100-1000 B.C., but it has still to undergo detailed analysis by the British Museum.

Dennis Chaddock unearthed the torc close to a bronze axe head 12 inches beneath the surface of open downland near Warminster. An inquest will decide whether it was stored with the intention to recover it and is therefore treasure trove and the property of the Crown, or whether it was lost and so returns to the finder or the owner of the land.

Clare Coneybeare, of the Salisbury Museum, said that the quality of the torc suggests that it would have been worn by a chieftain. 'It is very important, particularly to Wiltshire, but also nationally. It is in extraordinarily fine condition, and a splendid ornament which would have been worn by someone of considerable status. Wiltshire is rich in archaeology, but we have never found a complete torc before.'

Nick Merriman, of the Museum of London, commented: 'It is a very rare find. There have been Iron Age torcs of around 600 B.C. found from time to time, mostly in East Anglia, but nothing like this in recent years. The owner would have been a near contemporary of Tutankhamun, and perhaps in his society as important, but so little is known of the period in Britain. There are no burial mounds from that time, but this may have been a votive offering to a god or buried as part of a funeral ceremony, or it might have been stored.'

The Walls of Jericho

A RE-EVALUATION of the excavation reports at Jericho has renewed the claim that the biblical story of Joshua is based on historical fact.

The initial investigation conducted in the 1950s by Kathleen Kenyon pointed to a destruction date of c.1550 B.C. for the city, which was at least 150 years too early for the historical Joshua to have been involved.

Kenyon based her theory on the absence of decorated pottery imported from Cyprus in later levels, leading her to surmise that the city had been long abandoned by 1400 B.C., the earliest possible date that Joshua and the Israelites could have entered Canaan.

But Bryan Wood, a pottery expert at the University of Toronto, argues that Kenyon's finds were made in a poorer part of the city, where the expensive imported Cyprus ware would never have been used.

Wood believes that pottery found at Jericho in the 1930s points to a destruction date of 1400 B.C., late enough to accommodate Joshua.

Other evidence from Jericho is somewhat consistent with the biblical account. Kenyon discovered that the walls of the city had suffered a sudden collapse. It has long been thought that the damage could have been caused by an earthquake which also halted the flow of the river Jordan as described in the Bible. Bushels of grain found on the site point to a hasty capitulation; a long siege would have exhausted supplies.

A burnt layer at Jericho yielded a carbon-14 date of 1400 B.C.

Wood cites the Egyptian amulets present as grave-goods which also indicate a destruction date of 1400 B.C. for the city.

Experts are generally agreed that Wood is correct in his theory. A serious dispute does arise however when Joshua is introduced into the picture. Many scholars think that he belongs to a later period (at least two centuries after 1400 B.C.) and that the Israelites arrived as peaceful immigrants, not warlike invaders.
The evolution of Greek art from the Geometric to the Orientalising, then to the Archaic and finally to the Classical and Hellenistic styles is often the basis for the arrangement of the classical collections in museums. In the media of sculpture and vase painting one can observe, walking from room to room, the changes in the portrayal of the human figure. Over the centuries the body changes from the stick-like figures in the Geometric Period to stiff and stylised in the Archaic Period, to idealised in the Classical Period and finally naturalistic in the Hellenistic Period. While this is well known to students and admirers of Greek art, less well known is the fact that these phases also characterise the development of the other artistic traditions of the Greeks as well. A rich exhibition of Greek jewellery from the Benaki Museum in Athens is touring three museums in the United States. After a two-month showing in the Dallas Museum of Art last spring, Gold of Greece: Jewellery and Ornaments from the Benaki Museum is on display at the Cooper-Hewitt Museum in New York until 13 January 1991, after which it travels to San Diego and San Francisco.

Whereas in subsequent eras jewellery generally served for little else than a setting for precious stones, to the Greeks it was another medium for artistic expression. Greek jewellers carved gold with exacting precision and, working without the aid of magnifying glasses, created such intricately detailed work that the viewer is dazzled by the result. Unfortunately, American museum visitors do not have the opportunity to see much Greek jewellery in the permanent collections of the nation's museums. Although the Metropolitan Museum of Art has an important collection, none of it is on display to the public. The Stathatos Collection of the National Archaeological Museum, Athens, the British Museum, the Louvre, and the museums of Thessalonike, West Berlin, Hamburg and Munich contain impressive dis-
plays of ancient Greek jewellery.

The two hundred pieces of jewellery in 'Gold of Greece' are organised chronologically, grouped according to period, ranging from the Mycenaean to 'Neo-Hellenic'. The Benaki Museum in Athens, which was founded in 1930 by a wealthy industrialist from the Greek diaspora community in Alexandria, contains a wealth of Greek arts and crafts from remotest antiquity to the present day.

As Mycenaean was 'rich in gold', it is no surprise that there has been much gold jewellery recovered from this period. Working in the second millennium B.C., the Mycenaeans used filigree, granulation and cloisonné to create striking gold jewellery. The exhibition at the Cooper-Hewitt Museum includes several sprays of Mycenaean beads and a number of delightful signet rings that depict sacrificial bulls.

The Archaic Period bull's head pendant (left) shows the remarkable effect achieved by Greek artists using invisible solder to attach tiny gold balls (granulation) to a golden background. The form of the bull's head rivals ancient bovine depictions in bronze or marble. A similar gold bull's head, but with an attached circular gold bangle, is in the Louvre. Superb archaic goldsmithing is also seen in the exhibition's pair of gold sphinxes, and in a signet ring that contains an intaglio depiction of a kouros-like body.

The ram-headed bracelet (above) dates to the Classical Period, but the tradition of crafting animal-headed bracelets was imported from the Near East in the seventh century B.C. This particular example shows how advanced classical artists were with the techniques of filigree, granulation and repoussé. Other classical works in 'Gold of Greece' include yet more animal-headed bracelets and amphora-earrings, both plain and richly granulated. The precise sources of the gold used in the Archaic and Classical Periods is not known, but the mines of Macedonia, Thasos, Thrace, Siphnos and Skyros are possibilities.

In the Hellenistic Period, after Alexander had made conquests in the East, Greeks had more access to coloured, semi-precious stones, and they began to incorporate them into their jewellery. They were used judiciously, however, so that the stones did not overwhelm the remarkably skilled carving of gold. An excellent example of how coloured stones highlighted, rather than overpowered, the gold work of Hellenistic jewellers is seen in the two diadems (below). The goldwork remains remarkably intricate and is actually accentuated by the deep insertion of the red stones at various points in the central Heracles knot. The upper diadem with its four strands is among the most famous works of jewellery anywhere. Pictured in John Boardman's Greek Art and in Reynolds Higgins' Greek and Roman Jewellery, and mentioned in Gisela Richter's Handbook of Greek Art, one can only imagine the dazzling effect it made worn across the forehead of an attractive woman in a Hellenistic court. These diadems, together with some other Hellenistic pieces in the exhibition, and some of the highlights of the Statthatos Collection all come from a hoard found in Thessaly (east central Greece).

Romans of the Republican Period were practical and unostentatious, and thus scorned the wearing of jewellery. By the Imperial Period, however, they had begun to appreciate the Greek arts, including jewellery. The finest Roman jewellery is an adaptation of Hellenistic forms and techniques, and thus we see animal headed bracelets and tiny golden amphorae. The gold ivy wreath (overleaf) is an object that is identifiable as Roman only by certain subtleties in the stem carving and in the leaf shapes. Golden wreaths were worn by the Greeks in

'Gold of Greece' helps us view gold jewellery not merely as decorative, as we are accustomed to today, but as an art form in its own right.

Greek Diadem, 3rd century BC, length: 74cm, gold, sard, enamel, and below, Greek Heracles Knot, 3rd century BC, length: 23cm, gold, sard, enamel
ceremonial processions and served as symbols of victory. Such wreaths were often found in burial contexts.

The late Roman jewellery in ‘Gold of Greece’ betrays a departure from earlier forms. There are gold coin necklaces and bracelets of cruder manufacture. The Byzantine objects also show more heavy-handed work and an increasing emphasis on Christian symbols such as crosses. The coloured stones used are large and, increasingly, overshadow the gold work. As we move through these sections of the exhibition it is evident that here, too, the jewellery reflects work in other artistic media. Deterioration of style and a preponderance of Christian themes characterise art in the transition from Rome to Byzantium.

‘Gold of Greece’ helps us view gold jewellery not merely as decorative, as we are accustomed to today, but as an art form in its own right. Though jewellery is classified as one of the minor arts of antiquity, the exhibition should make a major impact as it travels throughout the United States. It has been part of a larger exhibition, ‘Gold of Three Continents’, which also includes gold jewellery through the ages from Africa and the Americas.

The catalogue accompanying ‘Gold of Greece’ (112 pp., $24.95 paper), though richly illustrated with numerous colour photographs, could benefit from expansion of the entries. Apart from Reynold Higgins’ Greek and Roman Jewellery, little is readily available on this fascinating subject, about which we hope to see more on display and more in print.

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MINERVA 8
Finds from the Varian Disaster

Anthony Birley

The massacre of three Roman legions by the German prince Arminius with the loss of 20,000 soldiers in the ‘Teutoburgian forest’ in A.D.9 was a decisive battle in world history. Since 12 B.C., Rome had occupied free Germany east of the Rhine, and the province of Germania from the Rhine to the Elbe was thought to be firmly under control. The governor and commander in chief Quintilius Varus, a kinsman by marriage of Augustus, had no suspicion that the Germans serving in his forces were plotting freedom. In the battle, the legions XVII, XVIII and XIX were wiped out. Rome was forced to abandon the newly conquered territory and, apart from a very limited area around Frankfurt, Germany east of the Rhine stayed free. The slaughter of the legions was a terrible loss to Augustus, who is said to have repeatedly banged his head against a door, crying: ‘Quintilius Varus, give me back my legions.’

Arminius – ‘Hermann’ – was to become a cult figure with the rise of German nationalism. In the nineteenth century an American society of German emigrants, ‘The Sons of Hermann’, paid for the erection of a colossal statue of the liberator (known to British soldiers as ‘Herman the German’). The site chosen was near Detmold at the southern edge of the forest called the ‘Teutoburgerwald’, presumably to be the ‘Teutoburgian forest’ that Roman writers named as the site of the massacre.

Germany antiquaries and archaeologists have naturally searched over the centuries for evidence to locate a site of such national importance. Arminius was, after all, something of a Caratacus, Boudica and Calgacus rolled into one – with the added appeal that, unlike these heroic British resistance leaders, he won. Opinion hardened in favour of a southerly location, hence the monument near Detmold. But as early as 1885 the great Theodor Mommsen had published a study favouring a site further north, near Osnabrück, where from the late seventeenth century onwards numerous Roman republican and Augustan coins had been found. Although his views found some support, the fact that the coins had not been excavated but accumulated over many years from chance finds aroused scepticism. Even so, by the start of the twentieth century there were a total of 17 gold aurei, more than 300 denarii, and 52 asses. None was later than A.D.12, and the vast majority of the Augustan ones belonged to the years 2 B.C. – A.D.12, especially denarii with Augustus’ grandsons Gaius and Lucius on the reverse. The latest datable Asses were counterstamped VAR, so they were issued under Quintilius Varus between A.D.7 and 9. The new Asses minted at Lyons from A.D.10 and issues from the reign of Tiberius (A.D.14-37) are completely absent.

In 1987 Captain Tony Clunns of the Royal Army Medical Corps, who was licensed to use a metal detector by the German archaeological authorities, discovered a new hoard in the same area of lower Saxony near Kalkrete as the earlier finds. Excavations have produced a further three denarii and some 40 Asses, twelve brooches, part of a chainmail breastplate, a remarkably well preserved silver-plated parade mask, and a whole series of other metal objects, many not yet identified, but no Roman pottery. The finds have an unmistakably Roman military character. Captain Clunns’ finds convinced the Osnabrück Museum of the need to carry out full excavations, and at the end of 1989 they started a major dig which has revealed evidence of a five-metre wide fortified embankment and postholes consistent with Roman military field architecture, both of which suggest that the Romans were on the site for some time and that it was more than a temporary camp.

Dr Wolfgang Schüler, archaeological director at the museum, said that the scalpel and stylus ‘indicate the presence of a legion’s general staff’. The evidence also points to a battlefield, not just a camp. ‘All the finds are either very small or fragments of larger pieces. The area looks to have been well plundered by the victors. All that was left was what had been trampled into the ground,’ said Dr Schüler. No bones have been unearthed, but this can be explained by the fact that bodies were normally burnt after a battle, and anyway would not have survived in the local soil.

Many questions remain to be answered, but this may be a very strong pointer to the location of the great ‘Varian disaster’ (clades Variana) or, at the very least, to the reprisal expeditions led by the ‘crown prince’ Tiberius in A.D.11-12. Moreover, now that fresh material has been located, Mommsen’s preferred site has gained many academic converts. The five kilometre strip on which the finds have occurred (large enough to accommodate three legions) sits astride a known prehistoric route where it runs from the edge of the Teutoburger Wald out into the North German plain.
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Archaeologists are occasionally accused of having a dry academic attitude to the past that alienates the public. One way of solving this problem is to hand the archaeology over to the professional entrepreneurs of the burgeoning 'heritage industry', who ensure that the dry academics are kept at arm's length. In 1984, the York Archaeological Trust in northern England took this approach almost to an extreme by creating the Viking Centre, a Disney-style time-car journey through Viking York that has so far attracted over five million visitors and spawned numerous imitations. But, despite its continued commercial success, the Disneyfied version of York's past has been accused - like many an innovative product of the 1980s - of excessive packaging and over-simplification.

"In the real world the sequel to 'Raiders of the Lost Ark' would certainly have been 'Indiana Jones and the Conservation and Analysis of Middle Bronze Age Artefacts found in the Ark'"

The Trust's most recent effort at bringing archaeology to the public, however, comes in the form of the 'Archaeological Resource Centre' (or ARC), which officially opened in February 1990. Whereas the Viking Centre aimed to guide the visitor through reconstructions of the past, the Resource Centre is intended to entice the visitor into the genuine working environment of the modern archaeologist. In this sense it is partly a response to criticisms of the Viking Centre from within the archaeological community.

Housed in the converted shell of St Saviours, a medieval church near the centre of York, the ARC is effectively an ingenious combination of three complementary functions: a storage area for the growing numbers of excavated objects, a research laboratory for the study of the finds, and the first "hands-on" resource centre for archaeology in Western Europe. This mixture of objectives must have made the conversion of St Saviours - at a cost of nearly half a million pounds - a difficult design problem.

The aim of the ARC is in some ways simply an extension of the opening up of digs to the public, since it allows school parties to watch the second stage of the process - the cataloguing and analysis of the finds, which has traditionally been a backroom, low-profile activity. The great challenge of the Resource Centre is to demonstrate that there is a great deal more to archaeology than excavation. Digging, however, is a reasonably dynamic and watchable activity, whereas even archaeologists would admit that watching people sorting and examining finds is a less likely prospect for visual stimulation.

The manager of the ARC is Andrew 'Bone' Jones, whose career to date as a researcher in environmental analysis and author of a book on ancient fishbones places him firmly in the glamour-free area of archaeology. He is keen, however, to plead the cause of 'fruit pips, seeds and tiny bones', which can provide just as much information about life in ancient York as any number of Viking swords or helmets. The idea of the ARC is to allow visitors to become far more involved with the archaeological...
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process than they can ever be at traditional museums.

As well as watching the archaeologists working on the finds in glass-fronted offices on the upper floor, the visitors themselves are shown how to examine and sort real objects from excavations at York, ranging from the ubiquitous potsherds to bones, textiles and soil samples. There is a marvellous scope for experimental archaeology, with opportunities to weave on a Viking loom, stitch a Roman shoe or pick a Viking padlock - all of which surely represents a definite advance on the Viking Centre, transforming the passive occupants of 'time-cars' into actual participants.

The ARC is a showcase for the increasingly sophisticated archaeological use of computers. One of the high points of a visit to the Centre is the chance to use the interactive videos, by which computerised images, graphics and text can be called up from a laser disk, allowing the Coppergate Viking site excavations to be explored via a touch-sensitive screen. When this has been linked with the Trust's researchers' computerised database of finds, it will also be possible to view the images of thousands of objects by the same method. The beauty of the ARC lies in the fact that the same equipment designed to entertain and educate visitors to the centre is also a useful tool for the professional researcher.

In 1922, when Howard Carter took his first glance into the tomb of Tutankhamun, the 'wonderful things' that he saw may have represented the culmination of his career as an excavator but they also presented him with many arduous years of cataloguing and conservation, which he had not completed at his death in 1939. The fate of Tutankhamun's treasures - which incidentally are still not fully published or analysed - is perhaps the best example of the archaeological balancing act between digging and post-excavation analysis. In the real world the sequel to 'Raiders of the Lost Ark' would certainly be 'Indiana Jones and the Conservation and Analysis of Middle Bronze Age Artefacts found in the Ark'.

The glamour of digging and discovery can never quite be matched by the slow dogged process of analysing plans, stratigraphic sections and box after box of small finds. But the innovative York Archaeological Resource Centre is a bold attempt to remedy this imbalance, casting the spotlight at last on the unsung archaeological heroes of the conservation lab and the computer console.

The Archaeological Resource Centre, St. Saviourgate, York is currently open Monday-Saturday (10 a.m.-5 p.m.) and Sunday (1 p.m.-5 p.m.). Tel: 0904 64321. Admission £2.00 (adults) and £1.00 (children under 16).

Dr Ian Shaw is Leverhulme Research Fellow in Egyptian Archaeology and Archaelogical Correspondent for The Daily Telegraph, London.

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Monument to be found in the city today. 18 kilometres to the west of Antalya, between the rivers Duden and Aksu, lie the extensive remains of the impressive Roman city of Perge. Although Perge, like most of the cities of Pamphylia, does not play a prominent role in the historical annals of the Roman Empire, the city nevertheless experienced an unprecedented degree of economic prosperity in the second century A.D., a prosperity reflected in the baroque conversion of the outer face of its theatre into a great nymphaeum which reached a height of over 12 metres. A startling array of monumental, almost complete marbles from the second century A.D. have been uncovered in Perge over the last 40 years and are now gloriously installed in the newly opened museum in Antalya, a short drive from the port by car.

Among the treasures are the colossal statue, complete with inscribed base, of Plancia Magna, a benefactress of Perge. Found in 1969 between the South Baths and the Hellenistic Gateway Towers, this statue (inv.no. A.3459), 2.01 metres high, depicts Plancia Magna in both chiton and himation, an end of which covers the back of her head. This is itself adorned with a crown decorated with four busts, the faces of which have been too damaged to allow identification. Nevertheless, enough of the paludamenta are preserved to suggest that these busts represented members of the imperial family. Plancia Magna herself must have exercised the office of high priestess of the imperial cult. Since her statue and hairstyle share stylistic affinities with representations of the Empress Sabina, one assumes that Plancia Magna served the cult of Hadrian. The eight lines of Greek inscribed on the base record that Plancia was also priestess of Artemis Pergaia, an ancient goddess who was still depicted on coins of the Imperial Period as a baetyl, or square block of stone, surmounted by a human bust.

Two Roman copies of Greek originals, found at Perge and now on view in the museum at Antalya, have helped to rewrite the history of Hellenistic sculpture. The first is a statue of Hermes, the so-called Sandalenbinder (inv.no. 3.25,77, 1.62 metres
Etruscan youth with discus. Bronze, 470 B.C. (Ht. 4 inches)

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high), discovered in 1977 in the Palestra of the South Baths. Replicas of this famous statue, attributed by most scholars to the fourth-century B.C. sculptor Lysippus, have been known for over two centuries in collections in Copenhagen, Paris, Munich, and the Vatican. But all of these had been found in pieces and were restored to greater or lesser degrees, thereby confounding the problem of the original’s appearance. This statue from Perge, pieced together to break from original fragments, resolves the issue once and for all. The chaste composition, in which the torso and head occupy the plane perpendicular to that of the axis of the raised foot, forces the figure to break out of its narrow artistic confines and engage the spectator’s imagination in order to complete the composition. Lysippus has frozen in time a transitory moment during which Hermes lifts his head away from the mechanical lacing of his sandal to focus his glance intently on Zeus. The viewer is asked to supply the image of Zeus in his mind’s eye. By so doing, the statue breaks out of its traditional confines and truly develops in the round, intruding on the space which surrounds it. The aesthetic achieved in this regard by Lysippus can be compared to the sculpture of Bernini which, likewise, breaks into space and becomes truly three-dimensional. The ultimate triumph of speed over slough is anecdotally conveyed by the position of Hermes’s right foot on the back of a tortoise, which, given the scale of the piece, wittily peers directly at the spectator.

A second example of this masterful integration of sculpture with its surrounding space in order to complete a narrative in the spectator’s mind’s eye is the recovery at Perge in 1970, just to the north of the monumental Nymphaeum, of another copy of the well-known Artemis of Versailles (inv.no. A-3731, 2.20 metres in height), now in the Louvre. Attributed to Leochares, a near contemporary of Lysippus, this statue depicts the virgin goddess in the hunt. She has just felled a hart, the horn of which she grasps in her outstretched left hand. Artemis is accompanied by at least two hounds, traces of which remain on the plinth to the left, and on the strut in the form of a tree trunk to the right. As she moves forward her attention is momentarily caught by something stirring in the forest to her right, the direction into which she casts her gaze as she reaches for an arrow from her quiver. Again the spectator is engaged, and the speculation that one’s eyes have improperly fallen on the body of the virgin goddess in an act of lesser majesty invites comparison with Actaeon, who caught a glimpse of the goddess in precisely the same accidental fashion and was mauled in turn by his own hounds. The attention to the details of the sandals and the allusion of the wind in blowing the gossamer garment against the lithe body of the goddess are masterfully achieved.

One last statue reveals the innovation of the sculptors at Perge and the quality of the museum at Antalya. In 1955 in the Street of the Columns a body (inv.no. A-3070) was discovered. Thirteen years later in the monumental Nymphaeum a head (inv.no. A-3279) was found which joined break to break with the body to form a statue 1.36 m. high in fine-grained white marble of the Egyptian goddess Isis nursing child Horus. The statue is remarkable for several reasons. On the one hand, images of Isis nursing Horus are known from the Roman Imperial Period and divide into two typologies. The first, known primarily from bronze statuettes, is somewhat hieratic and based on pharaonic norms for compositions in which the figures do not interact with one another. In these images the goddess is generally clad in a tightly fitting sheath dress, a costume which conforms, along with her throne and other attributes, to an ancient Egyptian canon. On the other hand, there are images from the same period which show this pharaonic theme in classical guise; the body of Isis, clad in flowing robes, reacts to gravity and interacts with the child, as here where his hand humanly touches his mother’s left breast. These examples, however, are always statuettes, habitually small in scale and sculpted from softer stones. This image of Isis nursing Horus from

"A startling array of monumental, almost complete marbles from the second century A.D. have been uncovered in Perge over the last 40 years"

Perge appears, therefore, to be not only the largest such image known but also the best preserved. Doubtless there were other such images erected throughout the Roman Empire. On the basis of the sheer scale of this sculpture one might be more ready to accept the suggestion that images of the Madonna Lactans in early Christian iconography were based on such pagan antecedents. This group is assigned to the second century A.D. on the basis of the treatment of the drapery.
More than a hundred years ago, Sir Flinders Petrie, the father of modern Egyptian archaeology, began his career in Egyptology. As he worked over the ensuing 40 years, he developed the unique and priceless collection of Egyptian antiquities that forms the Petrie Museum of Egyptian Archaeology. Part of the Department of Egyptology at University College London, this collection combines artefacts either discovered during his many excavations and those of his colleagues and successors, or purchased by him in Egypt; it has also been supplemented by additional gifts and donations. The outstanding array of material covers the full range of Egypt's complex history and is being increasingly recognised as important to scholars, students and interested lay people.

Sir Flinders Petrie was born in 1853 and began his work in Egypt in 1881 when he went to survey the Great Pyramid, and he continued to work there until 1925, except for the years of the First World War. During that time he laid the foundations of proper archaeological method, excavated 43 sites and published 37 reports and 12 catalogues. After 1922 he went to work in Palestine, where he lived after his retirement from University College in 1933, and continued to add to his prodigious publication record, until his death there in 1942.

In his early career, Petrie worked under the auspices of the Egypt Exploration Fund, which was founded by Amelia Edwards in 1882, and the Petrie Museum contains some choice pieces collected by that indefatigable lady as well as a few objects from the E.E.F.'s early excavations. In 1893, Petrie began the organisation of his own Egyptian Research Account, which continued after 1905 as the British School of Archaeology in Egypt until it was disbanded in 1953, when its copyrights and assets were vested in the Department of Egyptology. Under the terms of Amelia Edward’s will, Petrie was made the first Edwards Professor of Egyptology at University College London in 1892 and, through the generosity of Sir Robert Mond and Walter Morrison, the College was able to purchase his collection in 1913. The field work of his students and successors in the E.R.A. and the B.S.A.E. brought additions to the collection throughout the 1920s and 1930s, such as those from the excavations of Guy Brunton and Gertrude Caton Thompson. Since 1952 the Department has been associated with the Egypt Exploration Society's excavations in Egypt, first under the late Professor Walter B. Emery who worked at Saqqara and in Nubia, then under the next Edwards Professor, Henry S. Smith, who has worked in Nubia, Saqqara and currently Memphis; the present incumbent of the chair is Professor Geoffrey T. Martin, who also works at Saqqara. The late Dr Anthony J. Arkell, who was the post-war curator of the Museum, also excavated in the Sudan during the 1940s-50s. The collection has been the grateful recipient of objects from these excavations, although the number of antiquities released in divisions by the Egyptian Antiquities organisation has decreased in recent years. In post-war years it has also received generous gifts from the Trustees of the Wellcome Institute for the History of Medicine in 1964 and 1980. Occasionally there have been private bequests, notably the Langton Collection of cat figures which was received in 1972.

The Petrie Museum of Egyptian Archaeology

Barbara Adams

The Unique Nature of the Collections

It is widely accepted that the Petrie Museum's greatest strength is its wealth of archaeological material dating from prehis-
museums of the world

A wide range of Egyptian artefacts. Although there is still a great deal to be done, where corrosion prevailed there is now shining, sometimes inscribed, metal; where salt and dirt once obscured, there are now clean stone, wood, ivory and painted objects; where fragments were disarranged, there are now whole pots, stone vases and figures. The list is endless, and our gratitude is due to Petrie and his contemporaries for salvaging this sometimes initially unimposing material in the inspired realisation that it would have so much potential for further work and publication.

The curatorial and conservation work involved in making the archaeological material better known can sometimes lead to interesting collaborative ventures. As part of the work involved in cataloguing and publishing the objects from the site of Hierakopolis, excavated by J.E. Quibell and E.W. Green in 1899-1900, Barbara Adams undertook a special conservation project. This involved picking off by hand the hard encrusted mud from the decorated ivories from the Main Deposit, which had been intermittently waterlogged for 5000 years, to reveal the Protodynastic and Early Dynastic reliefs beneath. As a result of her publication of the Hierakopolis material in 1974, she was contacted by Professor Michael A. Hoffman, director of the current American archaeological expedition to the site. She has now been a member of the modern expedition for ten years and has participated in the excavation of Protodynastic and Early Dynastic cemetery and settlement remains. Due to this collaboration, the Petrie Museum lent some pieces from Hierakopolis and other sites to the University of South Carolina for a travelling exhibition to the United States of 1988-90 entitled 'The First Egyptians'. Barbara Adams contributed an essay on Protodynastic pottery to the exhibition catalogue which was edited by Kate Willoughby and Elizabeth Stanton.

Among the amazing results of the recent conservation programme are the earliest garments in the world. The Petrie Museum's textile collection is derived from Petrie's excavations at the Fayum centres of Tarkhan, Meidum, Djesheh, Guheb, Iltahun and Hawara. In 1977, a group of these textiles underwent their very first treatment in the Conservation Department of the Victoria and Albert Museum. During the preliminary sorting of a tumbled heap of dirty funerary linen, the conservator, Sheila Landi, made the exciting discovery of the pleated tunic of a child which came from a grave at Tarkhan. Now conserved and properly mounted for display, this piece of clothing dates to the reign of king Djet of the First Dynasty (approximately 2800 B.C.), making it the earliest preserved linen garment from Egypt and perhaps in the world. Since its discovery, restoration and publication with Sheila Landi, Rosalind Janssen has gone on to become a specialist in the study of ancient Egyptian textiles and has published other pieces of textile in the Petrie Museum.

Conservation and Discoveries

The collection has suffered from many practical vicissitudes of storage, care and recording, which are at last being satisfactorily resolved. When Professor Stephen Glanville succeeded Petrie in 1933, he launched a programme of object cataloguing, for which Petrie had never had the time, helped by Elise Baumgarten, Violet Lefleur, Margaret Drower and Julia Samson. During the Second World War, the collection was packed away for safe-keeping in countryside and basement storage by Professor Glanville. When it was again installed in College premises, unpacking and curatorial work began in earnest in 1951 under the Curator, Dr A.J. Arkell, who was helped by Martin Burgess. Given the limited and unsuitable nature of the accommodation in a disused dray-horse stable, and the fact that only a small portion of the collection was registered before 1939, the results of the curatorial effort have been truly remarkable. The curatorial endeavours to this end which were relaunched by Professor H.S. Smith in 1965 with the aid of Joyce Townend, are now undertaken by the present Curator, Barbara Adams, and the Assistant Curator, Rosalind Janssen. They have been helped greatly by the programme of conservation begun in 1975 in collaboration with the Conservation Department of the Institute of Archaeology, which arranged for students to work on selected artefacts. Before that, two departmental technicians, Martin Burgess and Stephen Harris, contributed their own finesse in matters of restoration and cleaning. Since 1980, the bulk of the conservation work on the collection has been undertaken on a freelance basis by an extremely talented couple, Richard and Helena Jaeschke, who have a special understanding of the needs of...
notably the two old Kingdom dresses from Deshasheh. She has also established a link with the Textile Conservation Centre at Hampton Court where the students undertake textile conservation projects on pieces from the Petrie Museum.

A similar tale of rediscovery and restoration concerns two limestone leonine statues. Stone lions, especially large ones, are rare from the Predynastic and Early Dynastic periods of Egyptian history. In 1894, Petrie excavated in the temple of Isis and Min at Koptos in Upper Egypt and discovered three monumental lions. The smallest of the three (length: 66 cm.) is in the Ashmolean Museum, Oxford, but the two large lions found in a fragmentary condition in the basil clay beneath the level of the later Ptolemaic temple stairway and never illustrated in the site report of 1896, seemed to have disappeared. For many years their whereabouts was unknown until, in 1980, a chance contact between Barbara Adams and the Wellcome Historical Medical Museum resulted in the rediscovery of the ‘lost’ lions of Koptos, still in fragments, stored in wooden tea chests marked ‘Koptos Lions, 1894’ in the Wellcome collection store. The Wellcome Trustees generously gave the boxes and their contents to University College London. Research in the Petrie archives revealed that Petrie had given them to Sir Henry Wellcome in 1927 in the hope that the Wellcome conservators could reconstruct the lions, a task which Petrie had been unable to organise.

Today, the thousands of fragmentary stone pieces have been painstakingly reassembled by Richard Jaeschke, a restoration the Wellcome Museum was never in fact able to achieve. The two lions each measure four and a half feet long (1.60m.) and weigh half a ton. They possess the features of the Archaic type of lion: an open mouth with bared teeth, curving muzzle lines, a rather robust body and a tail rising up from the root over onto the centre of the back and curling to the left. The lions date to at least the early First Dynasty (3050 B.C.), which makes them, if not the most beautiful lions known from ancient Egypt, certainly the largest lions of this early period. The tale of their discovery, rediscovery and restoration is told in a monograph by Barbara Adams and Richard Jaeschke. The lions are presently displayed outside the Provost’s office in the central building of University College London.

An extensive conservation project currently in progress is the cleaning and mounting of the Graeco-Roman wax encaustic mummy portraits, of which the Petrie Museum has more than any other Egyptological collection, although often in a bad condition. These were tied into the mummy bandages of the deceased as a record of the individual in life during the first and second centuries A.D. at Hawara in the Fayum. Such was the typical method Petrie employed, keeping back the difficult pieces in his own collection for the development of refined techniques and further study. Various conservators have tried their hand at these portraits, which are works of art as well as archaeological objects. Finally, a successful method of conservation and display has been perfected by the Jaeschkes, which allows the portraits to be displayed and studied on specially moulded perspex mounts. If a change in environmental conditions should cause the thin wood panels on which the wax pigments were applied to warp, the perspex mounts can then be re-moulded to fit. The Friends of the Petrie Museum are now helping to complete the conservation and mounting of these portraits so that a fully illustrated catalogue can eventually be produced. Quite a few of the dirtiest portraits are now revealing the images of previously unknown, ever youthful faces of the Greek and Roman inhabitants of the Fayum oasis.

**CURATORIAL AND PROMOTIONAL ENDEAVOURS**

Members of the Department of Egyptology often muse on the joy Petrie would derive from seeing his collection being so actively used today. It has not become a sterile, dry-as-dust assemblage, but a growing source of information, which can be collated with the data being produced by modern excavations in Egypt. Knowledge of the collection is being more widely disseminated through the publication of a series of scholarly catalogues and volumes published by Messrs Aris and Phillips. Commencing in 1972, the series now includes such topics as statuary, inscriptions, canopic equipment, ostraca, coffins and materials from the archaeological sites of Hierakonpolis, Gurob, Koptos and Amarna. This series is gradually completing the publication of the collection, together with numerous articles by the staff of the department of Egyptology and other scholars which are regularly published in journals and magazines. The popular Shire series, launched in 1984 and edited by Barbara Adams, features many objects from the Petrie collection in the small volumes on specific topics. As the conservation work has progressed, so have the services provided by the museum within the constraints imposed by staffing levels; a loyal band
of volunteers also helps with various administrative and basic tasks. Although there are still objects to be registered, nearly 40,000 have now been recorded.

Over the years, as the collection has become more accessible, demand from scholars has increased, as have visits from members of the general public. The staff process technical photographic orders for researchers through the College Photographic and Illustration Department, and microfiche of the Petrie excavation notebooks and tomb cards through the Photographic Unit of the University, as well as dealing with correspondence inquiries from all over the world. Parties from art colleges, extra-mural centres, foreign universities, societies and schools are guided around the museum by appointment. Objects are frequently sent on loan to major British and international exhibitions, a process which requires curatorial attention to the details of valuation, packing, transport, photography and display. Important exhibitions in recent years to which objects have been lent include pottery of all dates to the ‘Umm el Qa’ab’ exhibition in Cambridge in 1982; New Kingdom treasures to the ‘Egypt’s Golden Age’ exhibition in Boston, USA, in 1982, and notable Middle Kingdom pieces to the ‘Pharaohs and Mortals’ exhibition in Cambridge and Liverpool in 1988. Samples are often provided for programmes of scientific analysis such as Carbon 14, archaeomagnitute, lead isotope, petrology, X-ray diffraction, thermoluminescence, electron microscopy, anatomical X-ray and botanical species identification. To aid the general visitor a small guide to the exhibitions was produced in 1977, which is constantly updated and re-issued and is now in its fourth edition. The museum runs a small sales point which sells the guide book, other books relevant to the collection and some by the Department’s associated staff, postcards, slides, posters and replicas. The revenue from this endeavour, together with that from other charges and fees, has been put to immediate curatorial use. For instance, with the addition of grants from the Area Museum Service, the archive collection of several thousand dangerous cellulose nitrate negatives was copied onto modern safety film from this source of funds.

For teaching undergraduate students the culture of ancient Egypt through direct contact with its remains the Petrie Museum is unrivalled. For the researcher and mature scholar it is a veritable mine of new discoveries. For members of the public it is a place to deepen an interest in the subject of Egyptology.

**RECENT IMPROVEMENTS AND DEVELOPMENTS**

Between 1981 and 1984, the Petrie Museum was one of the subjects of the University College Appeal, when funds were sought to re-house the collection in new, purposely renovated quarters. Unfortunately, the amount of money required to provide this new museum was not realised, so in 1985 a further appeal was launched by the Department of Egyptology, master-minded by the then Edwards Professor, H. S. Smith, to raise funds to renovate the present accommodation. Due to generous contributions from University College London, the Museums Commission, the Area Museums Service for South East England and many private donors, enough money was raised for the internal works to take place in 1986-8. During 1986 a false ceiling was built in the museum to screen the plant of the new environmental system which was installed to maintain the temperature and relative humidity.
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required to safeguard the objects. Daylight was thereby excluded and a new controlable, ultra-violet screened lighting system was incorporated. Prior to the commencement of these works the entire exhibited collection, which involves a considerable number of objects, was dismantled. After the renovations were complete the objects were then re-exhibited with new labelling; this process took a year. During 1989-90 a complete re-roofing was undertaken to solve finally the problem of the constantly leaking roof, floods from which have caused object damage in the past.

When the Petrie Museum re-opened in June, 1988, the opportunity was taken to launch the Friends of the Petrie Museum to engage the interest and help of enthusiasts of Egyptology in the enjoyment and safeguarding of the collection. A full programme of museum object seminars, lectures, other events and a newsletter are provided for the Friends by the staff and associates of the Department of Egyptology and the stalwart voluntary committee. In the first year of the Friends’ existence the association was able to contribute to the conservation of objects in the museum, notably the base of a Late Period coffin, which had been damaged in a museum flood. There is still a pressing need for the conservation of this large collection, so the Friends can play a very real part in looking after its treasures for posterity; the membership is open worldwide and has been growing steadily.

BIBLIOGRAPHY


Barbara Adams is the Curator of the Petrie Museum of Egyptian Archaeology, University College London.
Indonesia, known historically as the ‘Spice Islands’, is the fifth most populous country on earth. The world’s largest archipelago girds the equator, its 13,677 volcanic islands stretching from west to east across some 3000 miles of water between the continents of Asia and Australia. Situated on the major trading routes between India and China and originally populated by many different tribes, Indonesia naturally evolved as a cultural crossroads. The resulting diverse character of the nation, a feature since the Bronze Age, continues to the present day. The eighth to the fifteenth centuries, known as Indonesia’s classical period, saw a flowering of Hindu- and Buddhist-inspired art in Indonesia. The first major exhibition of ancient Indonesian art to be assembled in the United States is currently on display in the East Building of the National Gallery of Art until 4 November. *The Sculpture of Indonesia* assembles, for the first time, the finest examples of works of art of the Indonesian classical period from Indonesia, Europe and the United States. Buddhist and Hindu life-size stone sculpture, bronzes, delicate figurines made of gold and silver, and ceremonial objects dating from the classical period are the principal objects on display. There are also four outstanding pieces dating from the Bronze Age. Some works, including a pair of small gold figures holding hands, have been recently discovered.

Knowledge of metalworking techniques came to Indonesia from China and Southeast Asia around the third century B.C. Along with the techniques of bronze casting, Indonesian craftsmen adapted decorative motifs – designs of spirals and concentric circles – from the early bronze work they saw. The scarcity of some of the metals that were used in making bronze, and the difficulty and expense of casting bronze from clay moulds
CULPTURE
INDONESIA

of Indonesia, an eighteen-month U.S.
National Gallery of Art in Washing
ton
bition of ancient Indonesian art

M. a Ponti

ensured that it was used for the most special objects. 
Although the precise function of many objects is
unknown, it seems likely that they were used in
tribal worship of ancestors and spirits. The bronze
age ceremonial axe is from the island of Roti. It has
a thin circular blade attached to a handle by a shaft
in the shape of a man seated with his knees drawn
up. The handle terminates in a stylized crocodile’s
head. The upper part of the man’s body, his arms
and his head with its huge ceremonial headdress are
represented in low relief on the blade. One of three
bronze axes of the same distinctive shape excavated
near Landu on the north side of the island of Roti in
1875, this example suggests a flourishing industry
capable of producing highly original objects. The
thin blade and elegant decoration indicate that the
axe was not meant for everyday use.

Sometime before the seventh century, the two
great Indian religions of Hinduism and Buddhism
were brought to Indonesia by merchants and mis-
sionaries from India and Southeast Asia. This
inspired the building and decoration of elaborate
and, in some instances, massive temples. From
c.730-c.930 monuments were concentrated in cen-
tral Java where Hindu-Buddhist dynasties flour-
ished. Indonesians added elements of their indige-
nous beliefs to the practice of Buddhism and
Hinduism, and eventually merged the belief systems
into unique Indonesian Hindu-Buddhist cults. The
artistic legacy of the Buddhist-Hindu period owes its
richness to the development of the institution of
kingship, also originating in India, which occurred
first in central Java, the largest island of the Indone-
sian archipelago, at the same time as the emergence
of the new Indian religions. The consolidation of
authority under kings, who harnessed the great
mineral and human resources of the islands, ushered
in an age of extraordinary activity in the areas
of architecture and sculpture.

The ambition of the central Javanese kings
resulted in the construction of more than a thou-

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sand temples. These buildings were ornately decorated with sculpted images of Hindu and Buddhist deities and narrative reliefs illustrating sacred legends. The temples were believed to function as temporary houses for the gods when they came to earth. Some, like the ninth-century Buddhist shrine of Borobudur, were built on a huge scale as symbolic representations of the universe described in ancient Indian literature. Borobudur is the largest Buddhist temple in the world, rising like a pyramid on ten terraces covering a hill. The lower levels of Borobudur feature carved reliefs illustrating the life of the Buddha, the story of a Buddhist pilgrim, and other Buddhist legends. 504 life-size statues of Buddha were placed in the temple, one of which can be seen in the exhibition. This ninth-century Amitabha (?), who presides over paradise where the enlightened are reborn after death, sits cross-legged with his hands resting in his lap and closed eyes in the classic pose of meditation. He is clad in a simple monk’s robe with the right shoulder bared. According to the traditional description of the Buddha, his hair is arranged in closely spaced curls, all turning clockwise. His elongated earlobes suggest the former use of ear pendants, part of the jewellery discarded by the future Buddha when he resolved to seek the road to Supreme Enlightenment.

Although no colour can be found today on the temples, traces remain of a thin, hard layer of plaster, used to prevent moisture from penetrating the stone, which may have been painted. Reliefs depicting artists painting toys and stone, and pestles used for grinding pigment would seem to indicate that the use of colour was fairly common.

The art of working bronze and precious metals flourished alongside that of stone statutory throughout the Hindu-Buddhist period. Important cult images from central Java have been found, including the silver figure of the Youthful Bodhisattva Manjusri of the early tenth century, from Ngeplak Semongan. Unique in Indonesian art, this statuette is cast in solid silver of high (92%) purity. All other known examples are of bronze with a thin coating of silver. The figure of the Buddhist deity, Manjusri, extends his promise of eternal bliss with one hand open in the boon-granting gesture while the other delicately grasps a sinuous lotus stem. A book, doubtless a reference to the Buddha's teachings, sits in the lotus blossom, itself a symbol of creation and the renewal of life. The Bodhisattva wears a conspicuous necklace made of a rectangular amulet incorporating two tiger’s teeth and pendants, some of which take the shape of tiger's claws. The figure is clad in a loincloth with floral designs, held at the waist by a belt with a decorated clasp.

To represent the new religions, Indonesian artists and craftsmen assimilated the Hindu and Buddhist artistic traditions of India, choosing the ones consistent with local beliefs and reinterpreting them according to local aesthetic ideals. Metalsmiths and stonecarvers fashioned cult images of the Buddha and of the Hindu divinities Siva, lord of life and death, Visnu, god of light, and other deities in the Hindu pantheon. Comparing these works with Bronze-Age statuary from Indonesia, one sees an advance in technical achievement and a marked neoclassic, favouring fluid modeling and an idealised naturalism.

Around 930 A.D., due to an unknown natural disaster, perhaps a volcanic eruption, the population of central Java suddenly abandoned their temples and moved east. A new centre of power, which was also distinguished by the building of monumental temples, rose up in East Java. Stylistic development in architecture and sculptural arts during the Indonesian classical period can be charted by comparing earlier central Javanese art with its later east Javanese counterpart. East Javanese temples are generally smaller and have a more rigid, more rugged profile. In terms of sculpture, central Javanese works depict stouter figures in curvilinear lines. In east Java one finds more angular lines and slender, more fragile figures. Dance reliefs from throughout the classical period indicate that the sculptors knew the rules of classical Indian dance as if from actual performance. A masterpiece of East Javanese carving is the portrait sculpture of Prajnaparamita, the Goddess of Transcendental Wisdom (illustrated on front cover), of c.1300, from Singasari Temple. Seated on a lotus cushion, her hands are raised in front of her chest in the gesture symbolizing the Turning of the Wheel of the Law. The goddess wears rich jewellery, including a sacred thread consisting of triple strings of beads, elaborate bracelets and necklaces, and an ornamental, conical headress which contrasts with her serene facial expression, commensurate with her divine spirituality. The identity of the portrait is uncertain, but local tradition associates her with Queen Dedes, the daughter of a Buddhist priest and the first queen of the Singasari dynasty.

Another important east Javanese sculpture on display is the Standing Goddess of Queen, from Jebuk Tulungagung, dating from the late fourteenth-early fifteenth century. This exquisite and unique figure, laden with jewellery, stands on a double lotus cushion. In addition to a diadem, heavy ear pendants, necklaces, and anklets, she wears several girdles with hanging pendants that reach almost to her ankles. The most unusual feature of the piece is the exuberantly carved back of the pedestal covered with lotuses in different stages of growth, rising from the stylised waves of a pond. The lotus is a symbol of the renewal of life after death. Many sculptures of this period include lotus stalks beside the figure or at its feet, but this is the only known example of a sculpture with the back fully carved.
While cult images in metal were important in central Java, where important works of art have been found, for unknown reasons cult images in bronze and precious metals ceased to be made in the kingdoms of east Java sometime after the middle of the tenth century. The gold repoussé plaque of Sutasoma Carried off by Kalmasapada, of the fourteenth century, from east Java, is a masterpiece of the goldsmiths' art in east Java. It depicts an episode in the ancient Indian tale of the prince Sutasoma and the man-eating demon Kalmasapada. The brave and virtuous prince risked death by allowing himself to be carried off on the demon's back, and succeeded in converting Kalmasapada to nonviolence. The quality and subject matter suggest that the plaque was an ornament for a member of the ruling class.

With the coming of Islam to Indonesia in the fifteenth century and its prohibition of cult images, the role of sculpture was vastly diminished and the Hindu-Buddhist period gradually came to a close. The temples that had not already fallen victim to earthquakes and volcanic eruptions over the centuries ceased to function as sanctuaries and fell into disrepair, their stones scattered and their statuary removed. The objects from this era that survive today are primarily works in stone and metal, materials that resist the destructive forces of Indonesia's equatorial climate. Many temples were subsequently 'rediscovered' under low mounds in the nineteenth century. Painstaking efforts over recent decades have seen a remarkable number of temples reconstructed, using a combination of original stones and carefully marked replacements.

Similarly, the sculptural legacy of the period receives periodic boosts through the accidental discovery of objects in the ploughing of fields, in streams, and in limestone caves. Outside their original contexts, some of the objects cannot be identified as to precise function or use. Nevertheless, each adds to our knowledge of the long artistic history of Indonesia.

An illustrated catalogue of the exhibition is available, price $29.95 (softcover).

EXHIBITION SCHEDULE
To 4 November
National Gallery of Art, Washington D.C.
9 December-17 March, 1991
Museum of Fine Arts, Houston
27 April-18 August, 1991
Metropolitan Museum of Art, New York
28 September-5 January, 1992
Asian Art Museum, San Francisco
Prehistory comes to life in Spain

Neolithic cave paintings and other recent prehistoric finds are attracting archaeologists—and looters—to Javea, a Spanish holiday resort.

Sylvia A. Matheson

Ascenting some 40 metres down the steep, rocky side of Monte Montgó, one of the Costa Blanca’s best-known landmarks, several keen climbers were astonished to find themselves swinging outside a narrow cave entrance, invisible from the ground.

Intrigued, they worked their way inside the crevice (one of three concealed entrances as they later discovered), and crawling along a narrow tunnel, emerged into a cave some 10 or 12 metres long. This led to a second, smaller cave whose walls were covered with what have since been described as being among the best preserved prehistoric paintings in the entire province.

The climbers found human bones, pottery and an arrowhead on the cave floor and took them triumphantly to the nearby town of Gata de Gorgos.

Since that day in 1989 the cave has been examined by local archaeologists as well as by the distinguished Spanish Professor of Prehistory at Alicante University, Mauro Hernandez, who dates the paintings to the end of the Neolithic period. The cave is known in Valenciana as the Cova Barranc del Migdia, meaning the ‘midday gully’, because the midday sun strikes the gully throughout the year, with only a slight variation in the hour, lighting up the symbols on the walls. These schematic red and black symbols, including representations of the rayed sun in black (opposite), may relate to the religious beliefs of the period. The sun has from ancient times represented the ‘eye of the World and the Eye of the Day’; it symbolises both life and death and the renewal of life through death. In hunting communities the sun is the Great Hunter.

The figure of a man is also depicted, with rows of tiny running, deer-like animals in black (page 31). These, with the arrowhead and a plain vessel (opposite), date from around 3,000-2,000 B.C. The cave was also used as a burial place; in fact, there is a considerable depth of soil on the cave floor, probably concealing more burials.

‘This is the first time we’ve found burials and paintings in the same cave’, said Javea archaeologist Josep Casabo i Bernard. ‘Usually it’s one or the other’. The combination of burials and sun symbols may be evidence of an especially holy place, where possibly the remains of bodies originally interred elsewhere had been brought for ritual reburial.

The priority is now to seal the entrances against more intruders. Since the original discovery more artefacts have been taken illegally, and Josep Casabo is fighting to have them returned to the Municipal Museum in Javea. Once the cave, with others in the area, is secure, serious excavations can commence. The process is, however, handicapped not only by the usual lack of funds, but also by there being only one archaeologist, Casabo, on the museum staff.

The Migdia cave lies at the foot of what is known locally as ‘The Elephant Ear’, when viewed from the Javea side, Monte Montgó, which claims at 753m. to be the second highest peak in the entire Mediterranean so close to the sea, resembles a recumbent elephant with its trunk stretched towards the sea. An enormous cave, the Cova del Montgó, forms its ‘eye’, and the entire massif is a landmark in this part of the Mediterranean. For this, amongst other reasons, there are strong argu-
ments in favour of identifying Montgò as the Meroskopeion of the geographers Strabo and Avienus, and a maritime reference point for Greek trading vessels.

The huge Montgò cave (its entrance measures some 60 x 60 metres, and it is possibly more than 100 metres deep) has been superficially surveyed several times, and finds from the later Palaeolithic period, c.16,000 B.C., and from the Lower Neolithic, which in the Western Mediterranean dates from c.5,000 B.C. – 2,500 B.C., as well as much later material, are well represented in the Javea Museum, including the Eneolithic or bell-shaped urn culture of c.3,000 B.C.

A considerable layer of soil still covers the cave floor, which contains habitation levels going back to the Palaeolithic period. Earlier this year, Casabo discovered a number of subsidiary caverns connected by narrow tunnels, plus a second cave or an extension of the main one, now filled with rocks and soil. So far no paintings have been found but there are impressive stalactites and also numerous axes, pottery and other artefacts which are now in the Javea Museum. Looters have found a second way in through a hole in the walls, and it is virtually impossible to make these entrances secure before beginning further excavations.

Montgò forms a barrier between the town of Denia, certainly of Roman and possibly Greek foundation, and Javea whose port area shows evidence of Greek and Roman colonization. Javea town, some 3 km inland, has nothing earlier than the thirteenth century A.D. to show although it is surrounded by remains of very much older, prehistoric settlements and, following the Romans, Visigoth and Muslim occupation.

Recently Montgò revealed yet another fascinating cave which turned out to be just inside the Denia section of the mountain and which has not yet been officially examined. A trial trench yielded a great deal of palaeolithic material in the soil, while rocks falling from the rear of the cave disclosed another entrance piled some one and a half metres high with debris, including bones protruding from the rocks. What lies behind the debris, nobody yet knows, but it may be more examples of cave art. Certainly there will be artefacts to add to our knowledge of the early inhabitants of this area. But here again, the entrance must first be secured against looters before Denia archaeologists, who are now responsible, can conduct further investigations.

Other recent discoveries on Montgò include paintings in a rock shelter, or grotto, known as Balma Catxupa. The Palaeolithic paintings are in typical Levantine style: mainly large figures with much movement, stylised human forms with astonishing vitality and details of clothing, and lines of deer and a goat. One seated figure with feathers in the hair and wearing trousers, holds a bow in one hand and raises the other in the air. Other figures are shown dressed in a type of trousers tied to the legs, and wearing head-dresses of plumes. The paintings, like those in Madia, were probably done with fingers, thin sticks and feathers attached to twigs.

As Professor Hernandez, who examined the rock face, pointed out, these paintings allow us to see what man looked like in the Epipalaeolithic period and probably illustrate a ritual scene because the arrows held are
HOLY LAND POTTERY

THE TIME OF NOAH AND THE DECLINE TO IDOL WORSHIP, Early Bronze II-II. 3100-2600 B.C. Chalice. Wheel turned with wide bowl, rounded, with depression at center. Wide mouth with fine, everted lip. Short foot wide at base which is string cut. Brown, beige slip over ware varying from beige to pale red. 7cm. This piece in no way resembles the fine Iron Age chalices which it would ultimately give rise to [Amiran 665.2]; P.E.P. 1972-13 XXI:1-4. Qered 20 photo p.71 but rather seems an improvement upon the cruder chalices of gold [Amiran 5:3]. Chip at foot. Choice $200.00

TIME OF SAUL AND DAVID. Iron IA-JIC-c. 1100-900 B.C. Wheel turned bowl of roughly cylindrical body with elongated rim at midpoint. Beige-buff slip over grey ware. String cut base of irregular form. dia. 6 cm. Tushingham (Jerusalem).—Bowing
Choice $225.00


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nowhere shown vertically as they would be if they were in action, so this cannot be a hunting scene.

The Sierra del Montgó area contains at least 20 known archaeological sites, including Iberian with Roman at the foot of the slopes. Probably the most famous of all treasures discovered in the Javea area was the third to second century B.C. hoard of Iberian gold and silver jewellery – intricately worked tiaras, necklaces and bracelets found in an urn by a farmer labourer in 1904 in the area known as Llucà, now a local golf course. The Javea Treasure is now displayed in the National Archaeological Museum in Madrid.

This triangular-shaped valley between several ranges of hills extending inland on all sides would have formed a natural haven for prehistoric hunters whose trails would converge and cross the valley. Caves and grottos in the hills would offer both temporary and permanent shelter. Part of Montgó has recently been designated a National Park and supposedly protected both from treasure seekers and developers, but new villas are constantly appearing among the wooded lower slopes where in A.D. 918 the Cordoban Caliph Abd’ur Rahman III gathered some 130 medicinal herbs from Montgó, despite the ever-increasing development. The Muslim ruler may have set a trend for later Muslims who rested in Migdia since an eleventh-century Islamic vessel was among the finds in that cave.

Following the recent discoveries in and around Javea, it was decided to hold the thirteenth National Conference of Spanish Paleontologists in Javea last April. It was the first time the Conference had been held in Javea and some thirty participants from all over Spain gathered here. Participants included the Director of Archaeological Museums in Valencia, Cadiz, Novelda, Alicante, and Bilbao among others, as well as archaeologists from the Universities of Leon, Santiago de Compostela, Barcelona, Madrid, Salamanca and Tarragona.

The Solar Blasco Museum in Javea is named after its first Director and founder, a noted artist who was also the Mayor and an ardent amateur archaeologist and historian. Don Juan Bautista Solar Blasco, who died only a few years ago, opened the original museum in the tiny sixteenth-century Chapel of Santa Ana while the post office occupied another sixteenth-century building. One of Solar Blasco’s last acts was to have the post office transferred to another building, while the Town Hall purchased the mansion which was opened as a Museum in 1975.

The visiting archaeologists were intrigued to learn that Philip III of Spain, visiting Javea in 1559, played a traditional ball game with his host, the Marquis of Denia. There was an argument about one of the shots and the King turned to the onlookers for their opinion but only one was bold enough to answer, Antoni Banyuls, who diplomatically called out, ‘Majesty, you haven’t made a single fault – but the ball had!’

The King, impressed with his tact, took Antoni into his personal service, and ordered the construction of the mansion for his retirement – and a delightful setting it is now, with a fountain playing in the patio and its excellent displays, including frequent special exhibitions, the latest one dealing with the Islamic period in the Province.

There was a general discussion on the problem that affects archaeologists everywhere – that of illegal excavations and looting, both, alas, very prevalent in Spain. Because of the fear of treasure hunters, it was decided to wait until all the caves had been barricaded before making public any details of recent finds in
the Migdia and other caves.

Other problems discussed included techniques, funding, and the distribution of fauna during climatic changes. Dr Jose Aparicio Perez of the Museum of Prehistory in Valencia spoke on the complicated stratigraphy of more than 14 excavations at Jucar, dating from Mesolithic 1, an industry without bones, with two distinct cultures in the same period of a robbed and mixed level, and with a period of some 6000 years between strata – but with Mousterian material in most levels.

Dr Francisco Gilis Pacheco, the Director of the Museums of Cadiz, talked of work on lower Palaeolithic sites at Guadalete in Andalucia, whilst Dr Carmen Jorge Garcia-Reyes, Spain's foremost authority on geometries, made a learned and succinct contribution on the techniques of excavation.

A group of young archaeologists from the University of Barcelona illustrated a fascinating talk on the work of a joint Spanish/Argentine team at a 'Modern Stone Age' site at Yamana, on the borders of Chile and the Argentine. They hope to return for further work in two or three years' time. Today there are only two women survivors of this primitive tribe which until recently, was still using flint and stone tools, scrapers, and arrowheads, bone needles and 'harppoons', and living in primitive round huts made of leafy branches laid on stouter tree branches.

On the final day of the conference a visit was arranged to the Cova de les Cendres (Ashes) in the side of a cliff reached from the little yacht harbour of Portet. The cave, which is some 40 metres above the sea, is enormous and has only been partly excavated by a team from Valencia University. There are stalactites but no paintings. However, strata from the great depth of debris on the cave floor date from the Palaeolithic, through Mesolithic, Neolithic, Eneolithic and 'Campniforma', and include some very impressive four and a half metre depths of entirely Bronze Age material, with, on the surface, Iberian and Roman artefacts. All of this material is now in the Alicante Museum. The Valencia team is due to recommence excavations in Les Cendres this summer. Close to the cave, at the top of the hill, is also an Iberian site.

Within recent weeks another cave has been discovered on one of Montgò's outcropping hills, surmounted, as most are, with a little chapel and hermitage. There had been earlier excavations on this Santa Lucia hill with its typical Valencian Bronze Age village yielding much Bronze Age material, including worked flints for sickles, axeheads, stone pestles and mortars and agricultural implements. Recently, a quick surface inspection of the cave, whose opening has probably recently been enlarged either by animals or humans, revealed Bronze Age and Roman material.

Undoubtedly there are many more caves and archaeological sites still awaiting discovery in this small corner of Spain.
eastern state of Bihar, India.

At the time the sculpture was made, India was ruled by the Pala Dynasty (775-1160 A.D.), under whose rule Bihar became a renowned centre for the manufacture of elegant images of Buddhist gods in stone and bronze. The museum's relief of Vasudhara exemplifies a newly form originating in Bihar in the tenth century: elegant, vigorous bodies full of energy, beautiful costumes and ornaments, and monumental figures of solemn grace.

The sculpture would originally have been mounted in a niche as a self-contained element within the rich programme of decoration that would have entirely covered a Buddhist temple which has long since disappeared.

"The relief of Vasudhara exemplifies a new ideal of form originating in Bihar in the tenth century"

The nearly five-foot tall grey stone sculpture portrays the goddess standing on a lotus flower, the symbol of divinity, and forming the gesture of generosity with her right hand. She holds in her left hand the stem of a lotus that bears a bejewelled, grain-bearing vase. Small figures flanking the goddess pour gems and minerals of the earth from bags carried on their shoulders. Below, two figures representing the original donors who commissioned the sculpture kneel in homage to the goddess.

Vasudhara's hair is piled high on her head, enclosed by a diadem. She wears the jewels and ornaments characteristic of a royal personage. She is naked to the waist, but an elaborate belt secures a sheer dhoti covering her legs. An aureole behind the goddess's head bears the traditional Buddhist inscription, 'For all casual phenomena, the Tahtagata Buddha has explained the dynamics of causation, and their extinction. Thus spake the great monk.'

Greek geometric Pyxis acquired by the Cincinnati Art Museum

The newest acquisition by the Classical Art Department of the Cincinnati Art Museum, Ohio, is an exceptionally fine Greek geometric red-figure pyxis, c. 750 B.C.

Following the collapse of Mycenaean civilization in the late second millennium B.C., Greek culture effectively re-emerged in the late period known as the Geometric (ninth-eighth centuries B.C.), so named for its predilection for abstract, linear decoration. During this time the pictorial tradition in Greek vase painting began, and it is within the final stages of this period, known as the Late Geometric, that the pyxis falls. At this time, and shortly before, figural (human and animal) and floral designs entered the artistic repertoire, largely due to the impact of artistic impulses from the Near East.

The newly acquired vase is a large and extremely well-preserved example of a pyxis, a type of round lidded box or container. In the Geometric period, these vessels were typically ornamented with a tall central conical knob handle; more elaborate examples, however, employed one or more free-standing horses as a handle for the lid in place of this knob. It is within this latter category that this vessel falls. Examples of this type have been excavated from tombs of the wealthy in the city of Athens, where they were manufactured expressly as tomb offerings.

Its decoration is characteristic of the mature, or final, stages of the vessel type. The most diagnostic feature is the concentric frieze that decorates the main zone of the vessel proper. Like other vessels of the period, it is decorated, alternately, with swastikas and meander designs set within panels which are divided by narrower compartments or 'triglyphs' alternately filled with stacked lozenges or zigzags. The juxtaposition of square (swastikas) and elongated (meander) panels on the pyxis indicates that it belongs to a transitional stage between the Middle Geometric, when a continuous meander frieze was employed, and the Late Geometric, with its fully compartmentalised decorative scheme; the vessel may thus be assigned to the Late Geometric I period, datable to c. 750 B.C. The use of four horses as lid decoration also indicates a Late Geometric date. In contrast to their Middle Geometric predecessors, the horses have become more simplified and elongated in appearance.

This vessel is a particularly fine example of its type. In decoration, it compares closely with a group of vessels excavated from a cemetery in the Athenian agora, or public marketplace. The horses with their desired shoulder harnesses, are particularly close in style, as is the painted deco-
ration on the vessel itself. It is possible that the artist who created this vessel originated from the same Athenian workshop(s) that produced the agora pieces. In size, the vessel numbers among the largest of its type; in diameter it falls within an inch of the largest examples preserved (125" against 131"). The four-horse variety, such as this vessel, is the least common variant of this vase type: only a dozen or so published examples are represented in public holdings, all of them in major European collections. The horse-pyxis type is represented in American museum collections by perhaps a half-dozen complete examples, all of them of the one or two-horse variety. This vessel represents the only complete example in an Ohio public collection. The vessel's excellent state of preservation is quite unusual for the type. Not only are the vessel and the horses largely intact, but the painted decoration is remarkably well preserved (many of the known examples have worn or abraded decoration).

Glenn Markoe

The Kenilworth Tank: lead thieves at work in Roman Warwickshire

In August 1989 part of a lead tank was found in a field near Kenilworth, Warwickshire, UK, together with a large quantity of scrap lead. There were no datable associated finds and the tank was not in situ, but from comparison with other similar examples found in England the object would appear to date to the fourth century A.D.

The tank is 24cm deep with a diameter of at least 50cm and a probable capacity of more than 47 litres. The rim is turned outwards and the sides is decorated with a zig-zag line of cable. Formed of three sheets of lead, one for the base and two for the sides, the seams were sealed by strips of lead, and iron handles were originally set into the side seams.

The tank is badly distorted and seems to have been broken up in antiquity. One edge has been cut while the other seems to have been torn. Taken in conjunction with the associated 8kg of scrap lead and the lack of other finds, the tank may represent a metalworker's hoard. He may have begun to melt it down, but was unable to complete the task and never returned to recover his raw material, which was found by a metal detector user who immediately reported it to the Warwickshire Museum.

A further enigma concerns the function of these tanks. Recent research has suggested that they may have been used for the rite of pedilavium or foot-washing which formed part of the sacrament of baptism in many parts of the Roman Empire. Of the 15 tanks known from England, over half have Christian symbols, such as the Chi-Rho monogram. Though the Kenilworth tank lacks these overtly religious symbols it could have been a ritual object. If so, it may have fallen victim to the wave of paganism which spread through the Empire in the later fourth century.

The tank is now in the ownership of the Warwickshire Museum and is on display in the Market Hall, Warwick.

Philip J. Wise, Keeper of Archaeology, Warwickshire Museum.
What are Museums to do?

Dr Arnold Saslow

proved to be correct. Nevertheless, once a hole had been dug, or a furrow examined, there was no way of locating coins that may be only inches away from the edge of your hole.

However, as a result of the need during WWII to detect landmines, the metal detector was born. Early metal detectors were rather crude affairs, generally involving large back-packs, but by the late 1960s and early 1970s electronics had advanced to the point where they could be compact, light-weight, reliable and able to discriminate treasure from trash. On today's market there are literally dozens of models which seem to do everything but dig the final hole. If funds are low, and to buy one of the more expensive models is sometimes well over a thousand dollars, you can build your own detector from the many sets of plans which exist for the do-it-yourself enthusiast. One of the most famous hoards of this century, or perhaps ever, was the so-called 'dekadrachm' hoard of Athenian and Macedonian silver found in recent years in Anatolia, Turkey, by a local lad who had built his own metal detector and was simply trying it out in a nearby field.

One associate of mine estimates that in the mid-1970s, the modern metal detector was virtually unknown in Turkey. However, he says, by the end of that decade hundreds of detectors had been imported and put to good use. How does he know for sure? He imported many of them himself!

The next step is to learn how to use the detector. Go to a local site, along an old Roman road, find a friendly farmer who will let you examine his fields or, unfortunately, sneak onto a scheduled or known archaeological site and dig away during the dead of night. The results have been astounding. In Britain alone, which has never been a site for the most beautiful of classical coins, hoards of 20,000-40,000 coins have been found in recent years. I saw with my own eyes, literally buckets of Roman base Antoniniani being examined in the Coin Department of the British Museum in an attempt to identify previously unknown varieties and die combinations.

If the finds are made in a country with a well established system of 'treasure trove' laws, such as Britain, the chances are fairly good that the silver and gold coins will be reported, and thus examined by a major museum. To be quite honest, if similar coins are found in countries such as Turkey, the Lebanon, Syria, etc., the system of reporting and the 'laiss sez-faire' attitude of people is such that there is little chance of finding out exactly what was found rather than the dubs and drabs which might actually be brought in to be examined.

So what are museums to do? It must be readily apparent to even the neophyte in numismatics that the research done in past centuries must be woefully incomplete when compared to the sheer volume of coins found during the past 25 years. One option, of course, would be for museums to purchase the open market the specimens they need. It is the law of supply and demand that if museums could actually do this and buy at the going rate for the pieces concerned, then they would obviously be offered the pick-of-the-litter (at least in the Western world). The obvious problem is that museums simply do not have the funds to do this. Unfortunately, however, in the museum world there is also considerable infighting and, in many cases, petty jealousies amongst the various departments. Painting hates pottery, and pottery hates silver, and everyone hates the coins (with acknowledgements to Tom Lehrer).

Governments have too been trying to keep financially afloat to try and fund museums fully, even if they were interested, and building magnates simply cannot see why they should donate to a local museum when there is yet another skyscraper to build.

So hoards of hundreds of Macedonian fractional silver, thousands of Roman Republican silver denarii, bucketfuls of Roman colonial tetradrachms, and bagfuls of Central Greek silver are found and nothing is done to inform the various museums of their existence.
The Elements of Archaeological Conservation
J.M. Cronyn

This book is the result of nearly half a working lifetime spent teaching archaeological conservation at the University of Durham and, although intended in the main for those other than professional conservators who are involved in the understanding and care of excavated materials, it seems more than probable that it will become essential reading for students of conservation. In fact there is evidence that it has already done so for at least one course in the UK.

The book is arranged logically into an introduction and five other chapters on deterioration, general techniques of conservation, siliceous materials, metals and organic materials. Each chapter covers its topic very thoroughly and is profusely illustrated and referenced. Furthermore, the chapters are broken down into sequentially numbered sections, so that it is very easy to find what you want to know.

The book is, however, essentially a reference work, rather than a book to sit down and read. It is too full of basic facts to be readable in the general sense of the word, and it needs many juicy case histories to be able to keep the attention of the reader for long, but these were deliberately omitted. Nevertheless, as a mine of information it succeeds admirably, and no archaeological conservator can afford to be without it.

The real question in my mind is whether it really is a book for 'excavators, finds specialists, archaeometrists, museum curators, collectors or administrators', and, on the whole, I am doubtful. They will find it useful from time to time, but I think it is too detailed and too specialised. It reads like a conservation text book, and, as such, it will be welcomed with open arms by a profession which is starved of text books.

Indeed, the paucity of standard works means that it will also be used by students outside the narrow field of archaeological conservation.

As a text book I can criticise it only on two significant points: first the poor quality of some of the illustrations, which do not make their point because of the lack of contrast in the half tones (3.2b and 3.5d and e for example); and second the price of the hardback edition (now out of print) – if the paperback is economical at £16.95, then it seems to me that £50.00 for the hardback was far too much. Finally, as a scientist, plate 3.18 contravenes all basic laboratory safety rules as the separating funnel should be held securely by a laboratory clamp!

W. A. Oddy
The British Museum

Science-based Dating in Archaeology
M.J. Aitken

The name of Professor Martin Aitken, of the Research Laboratory for Archaeology and the History of Art at Oxford until he retired in 1989, is virtually synonymous with scientific dating methods, particularly in archaeology. This is a field in which developments are continually being made, whether by refinement of techniques or the introduction of new ones, and this volume in the Longman Archaeology Series is a timely, comprehensive and up-to-date survey of the present position. The time-span goes back several million years to the early development of hominids.

Aitken deals with his subject at two levels. The text is mainly written in plain language for non-scientists, with a minimum of equations and excursions into scientific techniques. But each chapter has endnotes which discuss various points in greater detail, and will interest scientific practitioners. The purposes of the book, as well as giving a comprehensive survey of the field, are threefold: a) to guide archaeologists as to which technique is the best for given conditions at any site, b) to improve their knowledge of the various techniques, and c) to give an up-to-date picture to dating specialists themselves of the state of development of techniques other than their own. Inevitably, individual specialities have become associated with specific laboratories, and the experts themselves need to know the latest situation of other dating techniques.

The whole field of scientific dating is covered, from radiometric to biological techniques. A general introductory chapter sets the background by discussing the climate-based time frameworks of the geological Quaternary period, covering the Pleistocene (glacial) and the current Holocene (post-glacial) epochs. The time-scale is provided by oxygen isotope fractionation at different depths in the ocean bed. A concise account of the Milankovitch Astronomical Theory of Climate is included. The discussion includes the pollen record, varve chronology and dendrochronology.

In the scientific techniques, pride of place is given to radiocarbon dating, which has wide applications; 'Libby' and 'revised' radiocarbon dates are discussed, as well as their conversion to absolute dating sequences by dendrochronology and other means. There is a brief description of other radio-isotopes, e.g. calcium-41, which may have applications in archaeological dating. The description of radiocarbon dating includes the comparatively new AMS method, which has reduced sample sizes, allowed measurements to be made on different chemicals in a sample, and reduced measuring times.

Potassium-argon, uranium series and fission-track dating are geological techniques which are being increasingly used in archaeology, particularly for the Palaeolithic period and for early hominids. Advances in techniques with potassium-argon mean that the latest age limit is being reduced, and hence archaeological applications are increasing.

Thermoluminescence (TL) dating is applicable to pottery and burnt flint and stones; optically stimulated luminescence (OSL or OSL) and optically stimulated phosphorescence (OSP) are being developed for dating sediments, while phototransferred thermoluminescence (PTTTL) is a refinement of TL for use with pottery. Electron spin resonance (ESR) is an alternative technique for measuring radiation doses in the bones of animals and is useful for dating tooth enamel, mollusc shells, coral, calcite and quartz.

Amino-acid racemisation can be used for dating bones, teeth and shells; hydration of obsidian (widely used for prehistoric tools) provides a dating method. Other chemical methods include glass-layer counting (for glasses), and measuring fluorine and other elements (for bone). Magnetic dating techniques are important for fired clay, e.g. furnaces and hearths, and may also be used with unburnt sediments.

References to other published material are plentiful, and Aitken is to be congratulated on gathering the information contained in many scattered sources into what is in effect a comprehensive textbook. It will remain in use for a long time, providing a dated record of the state of the art of dating, a state which undoubtedly will be refined and widened in the future.

Kenneth E. Jermy, F.S.A.

MINERVA 35
The Archaeology of London

The Strand Settlement

With the collapse of Roman rule in the fifth century, London vanished from the historical record and entered the ‘dark ages’. Until recently there was little evidence for a town of any size during this time, but new finds now point to the existence of a large Saxon settlement outside the walled Roman city of London. In this extract from his book Saxon London – An Archaeological Investigation (Seaby, 1990, £16.50), Alan Vince discusses the archaeological evidence for the existence of the Strand settlement.

There is no historical evidence for the existence of a settlement at London in the sixth century but Bede, writing in Northumbria in the 730s, referred back to the early years of the seventh century when London was chosen as the seat of the bishop of the East Saxons. He described London as a ‘mart of many nations’. This description could refer to the London of Bede’s day or to the situation in 604. However, a charter of the 670s mentions the port of London and we can be fairly certain that Bede’s description applied at least to the later seventh-century town.

Evidence for Saxon occupation within the city walls is slight until the late ninth century or later. Despite the poor survival of the archaeological levels of this date, the absence of pits and wells in the walled city suggests that any early or mid-Saxon settlement was very small. Nevertheless, until 1984 it was the consensus of archaeological opinion that the secular community, which historical records tell us existed alongside the ecclesiastical one, must have been small enough to fit in between the cathedral and the river, the only area in which any archaeological traces had been found. Now, however, it is believed that the main settlement of mid-Saxon London lay outside the walled city and was of a considerable size.

Southwark has no evidence of settlement of this date, despite a large campaign of excavation. Most of Lambeth would have been uninhabitable marshland and seems to have remained so into the sixteenth century, while excavations on the site of the medieval abbey at Bermondsey, at the edge of the marshland, suggest that it was agricultural land during the mid-Saxon period, although a settlement must lie nearby. North of the river there has been little opportunity for excavation to the east of the city and what work has been possible has shown that extensive areas have had their archaeological levels destroyed by late medieval gravel quarrying. Where levels survive they show that there was no occupation after the use of the area as a cemetery in the late Roman period until the late eleventh or twelfth century. No sites along the line of the Roman or Saxon riverside have been excavated but it is suspected, considering the underlying geology, that the area would have consisted of mudflats until it was reclaimed and the drainage controlled by a continuous river wall in the medieval period. To the north of the city a similar pattern of land use has been found at Spitalfields, while sites at Clerkenwell, Cloth Fair opposite St Bartholomew’s Priory and St Bartholomew’s Hospital confirm the documentary evidence that these sites were agricultural until acquired by religious institutions in the twelfth century. Most have produced some evidence for prehistoric or Roman activity, confirming that if early to mid-Saxon settlements had been present then some trace should have survived.

At the northern end of Tottenham Court Road an excavation on the site of Tottenhall, a medieval manor, produced a small group of early Saxon potsherds from a medieval ploughsoil. Somewhere close by must have been a settlement, probably dating to the sixth century, but no actual settlement traces were found. This is the closest known early Saxon settlement to the city but it would not be surprising to find similar scattered agricultural settlements throughout the London area.

Further south, traces of mid-Saxon settlement are plentiful, although until recently only one site, the Treasury in Whitehall, had been examined by archaeological excavation. This site, first thought to be that of a large timber hall, the residence of a local thegn surrounded by fields, is now thought to be on the edge of a large trading settlement extending along the riverside to the Fleet. If you stand in White-
hall, looking north towards Trafalgar Square. It requires a huge leap of imagination to consider that in the eighth century the riverbank would have run immediately under your feet. A Roman road ran in front of you, underneath the Strand and Piccadilly. To either side in the early Roman period may have been isolated burials and a scatter of Roman artefacts suggests that these burials were interspersed with farms. To the north-east is St Martin-in-the-Fields church, first recorded in the thirteenth century.

In the late thirteenth century the rumour of treasure trove began a ritual which lead to the desecration of consecrated ground. Five hundred years later, while rebuilding the frontage of the church, a stone coffin was found, presumably a reused Roman sarcophagus. Inside were two glass bowls (right) and some 'ashes'. Whether this term should imply that the coffin contained a cremation rather than decayed bone is unknown, but the glass bowls were acquired by Sir Hans Sloane, whose collection formed the nucleus of the British Museum, and are today to be found in the Department of Medieval and Later Antiquities. They are of a type well known from Anglo-Saxon burials and are thought to be of late sixth or early seventh-century date. This find lends some credence to the thirteenth-century chronicle and suggests that there may have been other, richer burials close by. A gold ring, also in the British Museum, was found nearby in Garrick Street (page 39). Its decoration appears to incorporate a cross and this, together with the filigree technique, suggests that it is seventh-century or later. Whether it too came from a burial is impossible to tell. Further finds, but of a more domestic nature, have been made to the north, underneath the National Gallery, in excavations in advance of the National Gallery extension and close to Leicester Square underground station.

Turning east along the Strand one can see that the road runs along the crest of a hill. To the left (north) the land slopes gently but on the right (south) there is a steep drop followed by an almost level terrace. The latter terrace is all made ground, of late medieval and later date, and the steep slope originally formed a cliff leading down to the river. On the site of the Savoy palace stands a sixteenth-century chapel which illustrates the original lie of the land. Nearby in 1924 were found some loom weights, a complete pot dated to the seventh century and a sherd of a decorated jar of Ipswich-type ware, a type probably of later seventh, eighth or early ninth-century date. These finds were discussed by Sir Mortimer Wheeler in 1935. In 1985 he reported the being evidence for a Saxon farm. Isolated finds have been made on either side of the road but the most worthy of note was made on the site of Jubilee Hall in 1985. This was the first of the recent batch sites to be excavated and revealed a single burial, which was clearly earlier than at least two phases of domestic occupation (represented by pits, wells and the remains of ground-level timber buildings).

Further east one comes to the crescent known as Aldwyche with Southampton Row and Kingsway running north from it. The name Aldwyche was borrowed from the locality a little further east where a triangle of land used to be bounded by the Strand to the south and Drury Lane to the north. Traces of settlement have been found to the east of the Aldwyche, the most easily of which was a hoard of coins, hidden in the 850s, probably at the time of the Viking raid of 841. This hoard was buried at Hare Court, part of the Middle Temple in Fleet Street. Excavations at St Bride's Church, which lies further east on a small promontory overlooking the Thames, leave open the possibility that there may have been a church on the site at this period, although the earliest stone foundations discovered were probably of eleventh-century date. To the south, the whole area once formed the extensive mouth of the River Fleet and much was only reclaimed in the late medieval period. Excavation has shown that there would have been mudflats, crossed by channels. One medieval timber pile is thought to have been a reused boat timber and has been shown by dendro-chronology to be of tenth-century date. Nevertheless, it seems that the mid-Saxon settlement avoided the upland in favour of the harder ground to the west. Further evidence in favour of this view comes from recent excavations at the City of London Boys School, on the edge of the Fleet mouth in the mid-Saxon period. Roman pottery was found there, presumably washed in from occupation sites just below St Bride's, but the first post-Roman activity can be dated to the twelfth century. Similar 'negative' evidence comes from a site at Barnard's Inn at the east end of High Holborn.

St Bride's Church would have been within sight of the walled city, but separated from it by the Fleet valley. It is possible that the church crossed this tributary, both below where Holborn Viaduct now runs and at Ludgate Circus. The state of these crossings by the seventh century is impossible to tell but no great engineering feat would have been needed to repair or rebuild them. Heading north, up Farringdon Street, one reaches the original crossing point of the Roman road which left London at Newgate and runs to the via Antonia at High Holborn, then as Oxford Street. Almost immediately one rejoins the street heading back west and finds St Andrew's Holborn. This church was described as the old wooden church of St Andrew in a charter of the mid-twelfth century, parts of the fabric of which we have just followed. Just how much of the area bordered by these two Roman roads and the Fleet was occupied in the mid-Saxon period is impossible to tell yet, but a remarkable proportion of the area should have archaeological levels surviving below the ground. Destruction has been greatest on properties fronting onto the main streets and so far no site actually fronting onto the Strand or Fleet Street has proved to have any archaeology left intact.

Much has been discovered in the last few years about the nature of this settlement. We now know that the majority of the buildings were rectangular, timber structures and that walling areas which may have been yards existed alongside them. Their rubbish was either shovelled into old cesspits and wells or left as middens. Much remains to be discovered. We do not know, for example, whether there was a regular street grid or whether the buildings sat within separate properties. At the closely comparable settlement of Dorestad on the Rhine delta, the settlement appears to have been divided into zones of differing land use: a mercantile zone next to the river lay in front of an agricultural one.

To date, the earliest finds from this area, known for convenience as the Strand or Aldwyche settlement, are possibly of sixth-century date and are concentrated in the centre of the later settlement, around Trafalgar Square. Middle Iron Age feature finds are more numerous but have the same distribution. However, by the ninth century the whole of the settlement seems to have been
occupied. Some early Anglo-Saxon rural settlements also covered a considerable area. Where they have been closely studied it seems that they were composed of nuclei which were cyclically occupied, so that the total area inhabited at one time was smaller than the extent of the settlement evidence. The contrast between this settlement (and similar ones elsewhere in England) and the earlier rural settlements is therefore even greater than it might otherwise seem.

The latest material from the Strand settlement dates to the early ninth century, although another hoard, deposited in c.870, was recovered from the bed of the Thames at the south end of Waterloo Bridge. The fate of the Strand settlement is still surrounded by mystery. The historical events of the ninth century were fast-moving and themselves only poorly understood. First, there was apparently a decline in overseas trade, which affected many of the large trading settlements of the North Sea coast. Settlements at Dorestad, Quentinac on the Quanché in northern France, Southampton and York as well as London all suffered the same fate, at more or less the same time. However, as far as is known there was no such drastic decline at Ipswich, where the mid-Saxon settlement underlies the later Saxon and medieval town, both of which seem to have been of similar size to the mid-Saxon town.

Second, from the late eighth century onwards England was once again subject to attack from seaborne raiders, this time from Scandinavia. Certainly, not all the Viking raids on England were recorded in historical records and there is no means of telling whether the recorded raids on London, in 841, 851 and 871, were the only ones or just the more memorable. Nevertheless, by the late 860s the Vikings had stepped up their assault on England (and the Continent) and in 870 killed King Edmund of East Anglia and later took over his kingdom. Four years later, King Alfred of Wessex, gave the Vikings a major defeat and replaced them with Norsemen.

In the ninth century trading settlements in the Viking sphere seem to have fared much better than those further south. Perhaps the best example is that at Håtahabu (Hedeby), the predecessor of Schleswig, on the Baltic coast. Not only is there no evidence for a sharp decline in size or number of settlements at this time, there is also some evidence for the growth of towns, such as Birka, in southern Sweden. If London had been absorbed into the Viking world then, like Ipswich, it may have flourished. However, in the 880s the tide turned against the Vikings and the English steadily regained territory, including London. The year 886 seems to have marked an important stage in this English recovery and during that year ‘King Alfred occupied London; and all the English people that were not under submissions to the Danes submitted to him. And he then entrusted the borough to the control of Ealdorman Ethelred’. A grant of 888/9 makes it clear that the main settlement at London was by then within the walls of the Roman city.

It is reasonably clear that until the middle of the ninth century the main secular settlement of London, Lundenwic in contemporary records, lay along the Strand and documentary evidence makes it equally clear that by c.890 the focus had shifted to the walled city. The exact timing of this movement is precise causes and under whose control it took place are all unanswered questions.

In 857 a ‘profitable little estate’ in the ‘town of London’ situated by the west gates was acquired by the bishop of Worcester. The location of this estate is of considerable interest and most commentators have assumed, since there is no evidence that the Strand settlement was ever walled, that the gates referred to in this grant must therefore be those of the Roman city. At first one naturally thinks of Ludgate and Newgate as being the gates referred to, but it was said at the end of the sixteenth century that Newgate was constructed in the twelfth century. We now know the gate is Roman in origin and it was ‘new’ in the twelfth century this must be because it had been rebuilt or unblocked at that time. It is just possible that Cripplegate or Aldersgate could be thought of as being west gates and if so this would have the effect of placing the estate inside the area of the Cripplegate fort. The previous holder of the estate was Ceolmund who gave his name to it, Ceolmundingahaga. The only ninth-century Ceolmund known was an ealdorman of Kent and there has long been a tradition that a royal palace lay in this part of the city, utilising remnants of the early Roman fort. The name Aldermanbury, ‘enclosure of the ealdorman’, survives today and presumably must date back to at least the late tenth century, since the position of ealdorman was largely replaced by that of the earl in the early eleventh century. A further possibility is that Ceolmund’s haga lay in the south-west corner of the city and that the west gates may have been in the demolished riverside wall. Wherever the estate was located, it was said to be profitable and therefore probably connected with trade rather than just an aristocratic residence. If it lay within the walls it therefore tentatively places the movement from the Strand to the city before the Viking takeover of Mercia. The Latin name used for London in this charter is probably a translation of Lundenwic, however, and this suggests either that the estate was in the Strand settlement or that the term Lundenwic was used to denote the trading settlement of London wherever it lay. Perhaps the most likely explanation would be that the estate lay at the eastern end of the Strand settlement, and for that reason was said to be by the west gates.

Further evidence comes from two documents, the first of which is a charter granting an estate called Hwætmundes stað in London to
Bishop Waeferthe of Worcester in 889/8. The estate's boundaries are indicated by its dimensions, a street to the north and the city wall to the south. The grant allowed the bishop's men to trade within the estate but sought to regulate trade outside, on the public street or the ripa emporialis, the riverside market. The later document is not a charter but a record of decisions taken by King Alfred at a council in Chelsea in 898/9. Two estates were granted, one to Waeferthe and the other to Archbishop Plegmund, and in contrast to the earlier grant both recipients were also to have the right to moor ships along the width of their properties. In 1978 the historian Tony Bulley published a paper in which he suggested, very plausibly, that the estate granted to Worcester in each case was the same. This enabled the descriptive information to be combined, leading to the identification of both estates on the ground. The later document revealed that the estates were close to Aethelreda hith, known from the twelfth century onwards as Queenhith. The Ethelred after whom Queenhith was originally named must be the same man to whom Alfred entrusted London in 886, his son-in-law and joint grantor in the 888/9 grant, in which he styled himself subregulus et patricius Merciorum. It is likely that the extra rights granted in 898/9 were intended to give London's economy an extra boost, especially considering that the subject of the Chelsea council was the renewal of London.

Not only do the Queenhith charters reveal royal interest in trade in London but they also hint that in the interval between the two documents new streets had been created. In the 888/9 charter only one street is mentioned, identified as a major east-west street known in the medieval period as Great Trinity Lane, Cloak Lane, Great St Thomas Lane and Knightrider Street. In the later document minor roads are mentioned which ran north to meet the public street. Two of these, Bread Street and Garlick Hill, have the distinction of being the southern ends of the only roads to lead all the way from the river to Cheapside. Such streets are likely to have been laid out before the area they crossed was densely occupied. This documentary evidence, together with a change in the name used for London from Lundenevic to Lundenhith, suggests that the walled city was by the late ninth century the center not only for defence but for commerce too.

The archaeological evidence to compare with the historical data is inconclusive. Only one small area of the foreshore in the south-western part of the city has been excavated, at Baynard's Castle. In 1974/5, this was some way away from Queenhith and produced no evidence for activity earlier than the late eleventh to mid-twelfth century. The site of the Hwetmundes stan estate has been excavated (near the site of the Huggin Hill baths) but all levels later than the second century have been terraced away, including pits and other features which might have contained residual Saxon finds. The only direct archaeological observation of any relevance is that at Well Court, fronting onto Bow Lane. Here, a small fragment of the early street was excavated, together with fragments of timber buildings built at ground level and fronting onto the street.

The excavation established that Bow Lane was not on the line of a Roman street but lay on top of late Roman dark earth. Its position in relation to the later medieval and modern streets suggests that originally it had been quite wide but that encroachment from either side had considerably narrowed it. The first surface was a coarse sand which contained a large amount of reused Roman debris: fragments of tile and building stone; while later surfaces were made from gravel brought into the city or perhaps dug from deep pits cutting right through the earlier occupation levels. Unfortunately there were few other artefacts in the road metalling or in the silt above and all those found were likely to have been of Roman date. The earliest timber buildings were likewise without contemporary finds but were replaced by a building containing a bread oven and sherd of late Saxon pottery. The absence of Saxon finds from the first road metalling does not mean that the road is likely to be of Roman date, and is hardly surprising considering the size of the excavation, but it may imply that the street was laid out before any Saxon occupation in the area.

The only other relevant archaeological evidence comes from the discovery of pits, buildings and loose finds of ninth century date. The first piece of evidence is negative. There are very few finds of pottery or other artefacts from the city that can be dated with close parallels amongst the rapidly growing collection from the Strand settlement. Hundreds of late Saxon and medieval pits and wells have been recorded in the city but only one contains a find of mid-Saxon character, a single-handled comb from a pit near Lambard Street. This suggests that there was no wholesale movement of inhabitants of the Strand settlement into the city. However, since we do not know precisely when the Strand settlement was abandoned this does not provide a fixed point for the chronology of the walled settlement. The earliest Saxon occupation recognised in the city is characterised by a type of pottery – Late Saxon Shelly ware, or ISS ware for short – which was still in use in the first half of the eleventh century. While this does not mean that it could not have been introduced in the mid-ninth century it does mean that there is no means of distinguishing a pit used at this time from one filled a century and a half later. The only way in which this problem will eventually be solved will be if it is possible to show either that ISS was used in the mid-ninth century, in which case there genuinely is no means of closely dating later Saxon occupation in the city, or by finding independently dated levels which show that it was not used, in which case ninth-century occupation in the city must have been sparse.

Loose finds of metalwork date art-historically to the ninth century have been found in the city, although their suggested dates tend to fluctuate as opinion changes. They are sparse and in no case come from deposits which might have a tenth-century date. The only other relevant find is a hoard of coins found on a site at the eastern end of Cheapside, Bucklersbury, in the nineteenth century. This hoard, which no longer exists, was apparently composed solely of late coins of Alfred. If correctly recorded, such a hoard would probably have been deposited before the end of the ninth century.

Our knowledge of mid-Saxon London has changed so rapidly over such a short period of time that it is difficult to summarise the evidence. It is nevertheless certain that the London of Bede lay outside the walls of the Roman city and occupied an extensive tract of land. It existed in the seventh century, flourished during the eighth and early ninth centuries but ceased to exist before the end of the ninth century. It is also quite clear that large-scale occupation within the walled city started only after the Strand settlement had ceased to exist. Within this framework there is plenty of room for differences of opinion as to the actual dates of these events and their nature. Only further archaeological work can hope to narrow down the range of possibilities.
MUSEUM EXHIBITIONS

UNITED KINGDOM

BOURNEMOUTH, Dorset
TEXAS WARRIORS FROM CHINA.
A exhibition about the life-size terracotta warriors made by the first emperor of China, Qin Shi Huangdi, who built the Great Wall of China. BOURNEMOUTH EXHIBITION CENTRE. (0202) 293544. Until 31 October.

DORCHESTER, Dorset
TUTANKHAMUN EXHIBITION. Reconstruction of the tomb of Tutankhamun at the time it was discovered. 25 High West Street, Dorchester. DORSET DT1 YUW. (0305) 65671. Until 31 December.

KEELE, Staffordshire
EAST INDIAN SUNRISE. A travel-ling loan exhibition from the Petrie Museum of Egyptology, University College London. KEELE UNIVERSITY. Walter Moberley Hall, Keele Park, Staffordshire. 13 October – 24 November (then to Worcester).

LONDON

ARCHAEOLOGY AND THE BIBLE. A major exhibition, mainly from the Museum of London's collections, illustrating the cultural and political history of the Bible. Seven of the Patriarchs to the domination of the area by Assyrians, Babylonians, Persians, Greeks and Romans. Several objects on display will be one of the Dead Sea scrolls and two of the world's oldest intact wooden planks from 'An Ghazal in Jordan. Includes three-dimensional representations of the human form. THE BRITISH MUSEUM (071) 723 8525. 19 October 1990 – 24 March 1991.

CAVES OF THE THOUSAND BUDDHAS: CHINESE ART FROM THE SILK ROUTE. A major exhibition of Buddhist art consisting largely of the remarkable finds made by Sir Marc Aurel Stein between 1906-9 in the cave shrines at Dunhuang, including manuscripts, paintings and textiles from cave 17, the walled-up 'library cave'. THE BRITISH MUSEUM (071) 723 8525. 14 September – 12 December. (See Minerva, June 1990, p.4)

ANCIENT PERUVIAN TEXTILES

A small display selected from the V&A's collection of Peruvian textiles. All but three pieces pre-date the Spanish Conquest in 1532, and a wide range of cultures and styles are included. VICTORIA AND ALBERT MUSEUM (071) 938 8361/8363/8364. Until 25 November.

STOKE ON TRENT

EVERYDAY LIFE IN ANCIENT EGYPT. A travelling exhibition from the Petrie Museum of Egyptology, University College London. STOKE ON TRENT CITY MUSEUM AND ART GALLERY, Bethesda Street, Hanley, Stoke on Trent. Until 6 October (then to Keele).

UNITED STATES

BOSTON, Massachusetts
TEN CENTURIES OF COURTYARD SPANISH PAINTINGS AND SCULPTURES FROM JAPAN. The 60 objects show the unique role played by the Japanese court in the patronage of the arts. It will include 11 National Treasures, 30 important cultural pieces and two objects from the Imperial Household. Many of these objects have been lent from the Sackler Galleries, Smithsonian Institution. 25 OCTOBER – 25 NOVEMBER.

BOULDER, Colorado
THE SIGMUND FREUD ANTIQUE DEPOT – SCULPTURES FROM A BURIED PAST. 63 Greek, Etruscan, Roman, Egyptian and oriental antiquities from the extensive Freud collection in London, together with books, manuscripts and photographs from his library. LOWE ART MUSEUM, University of Colorado (303) 492 8300. 7 September – 27 October (then to Coral Gables, Florida). Book with full catalogue, hardcover $29.95.

CHICAGO, Illinois
LEAVES FROM THE BODHIBR TREE: THE ART OF PALA INDIA (8th-12th centuries) AND ITS IMPACT ON THE ART OF INDIA. 100 objects, including stone and bronze sculptures, drawn principally from North American museums and private collections. SMART GALAISEY EXHIBITION, University of Chicago (312) 753 2121. 9 October – 2 December. Catalogue: $24.95.

CLEVELAND, Ohio
EARLY ISLAMIC ART FROM THE MEDITERRANEAN AREA. 50 7th to 13th century works from Egypt, Syria, the Levant, and Spain, including silk art. (With catalogue) CLEVELAND MUSEUM OF ART (216) 421 7340. Until Spring 1991.

POWERFUL FORM AND POTENT SYMBOL: THE DRAGON IN ASIA. Over 40 sculptures, textiles, ceramics, paintings and other decorative arts, many from the museum's own collections, tracing the evolution of the dragon in Asian art from the 4th century BC to the 20th century. CLEVELAND MUSEUM OF ART (216) 421 7340. Until 30 December.

YORUBA: NINE CENTURIES OF AFRICAN ART AND THOUGHT. The Yoruba of Nigeria and Benin are heirs to one of the oldest and finest artistic traditions in West Africa. This exhibition, organised and presented by the Center for African Art, New York, presents 123 works of art including exquisite, highly naturalistic works in terracotta and bronze dating as far back as the 12th century, drawn from public and private collections in North America, Africa and Europe. CLEVELAND MUSEUM OF ART (216) 421 7340. 10 October – 9 December (then to New Orleans). Book with full catalogue $65.

FORT WORTH, Texas
LIKEKNESS AND BEYOND: PORTRAITS FROM AFRICA AND THE WORLD. Some 50 works ranging from ancient Egyptian to contemporary, emphasizing the long-lasting tradition of portraiture in Africa, with sculptures from the kingdom of Benin. MUSEUM OF FINE ARTS, DALLAS (214) 901 7000. Until 11 November.

LINCOLN, Nebraska
ECUADOR. Pre-Columbian ceramics from a recent donation from the Petrie Museum of Egyptology, University College London. STOKE ON TRENT CITY MUSEUM AND ART GALLERY, Bethesda Street, Hanley, Stoke on Trent. Until 6 October (then to Keele).

LOS ANGELES, California

RIO AZUL CITY OF THE STORM GOD. Presents the archaeological exploration of a 5th-century Mayan city in Guatemala through video, maps, murals and artefacts and reconstructions including an entire tomb and its contents. TOMB 19, discovered in 1984. NATIONAL HISTORY MUSEUM OF LOS ANGELES COUNTY (213) 744 3414. Until 11 November.

SELECTED ANTIQUITIES FROM THE COLLECTIONS OF VARTA AND HANS COHN. About 70 objects, ranging from Roman to Egyptian and to Western Asian objects. LOS ANGELES COUNTY MUSEUM OF ART (213) 857 5111. Until 14 November.

NEW YORK, New York


GATHER GLASS. About 50 objects chosen to trace five techniques of glass decoration which served as bridges for pre-islamic cultures through the Islamic periods to Renaissance Europe and America. METROPOLITAN MUSEUM OF ART (212) 879 5500. Until 14 October.

GOLD OF GREECE: JEWELLERY AND ORNAMENT FROM THE GRAND HOMAGE. An extensive selection of small golden treasures from the museum in Athens. COOPER-HOVITT MUSEUM (718) 666 6600. 15 January 1991 (then to San Diego). (See p.6).

MEXICO: SPLENDOURS OF THIRTY CENTURIES. A major exhibition of over 400 works of pre-Columbian art, of which about one-third are pre-columbian, dating from about 1000 B.C. to 1520 A.D., including several monumental stone sculptures and gold and silver ornaments. METROPOLITAN MUSEUM OF ART (212) 879 5500. 10 October – 13 January 1991 (then to San Antonio). Catalogue: $39.95, cloth $49.95.

PASADENA, California

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SAN FRANCISCO, California

WASHINGTON, D.C.
THE SCULPTURE OF INDONESIA. 135 Buddha and Hindu figurines, stone sculptures, bronzes, gold and silver figurals objects, and ceremonial items from the Bronze Age to the 19th century. NATIONAL GALLERY OF ART (202) 842 6353. Until 4 November (then to Houston, Texas). Catalogue: $29.95. (See p.24).

MINERVA 40
AUSTRALIA

SALZBURG

ROMAN TERRACOTTA FROM SALZBURG. SALZBURGER MUSEUM CAROLINO AUGUSTEUM (0662) 84 31 45. Until 11 November.

CANADA

TORONTO, Ontario

CHINESE TREASURES OF THE R.O.M.: 4000 BC. A.D. 1907. From mysterious oracle bones and sculptures tomb figures to rare jade, bronzes, and ceramics, 209 of the most significant and unusual objects will be shown, drawn from one of the world's greatest collections of Chinese art. ROYAL ONTARIO MUSEUM (416) 586 5349. Until 31 March, 1999.

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FROM GAULS TO NORMANS. 2000 years of history, 30 years of archeology. The results of the last three decades of excavations in Normandy, including objects found and photographs of digs. MUSEE DES ANTIQUITES, 198 Rue Beauvoisine, 76000 Rouen. Tel: 35 98 35 10. Until 13 December.

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BIRMINGHAM, Michigan

CARVED IN ANTIQUITY (ancient stone objects). DONNA JACOBS GALLERY, 574 NORTH WOODWARD AVENUE. 5 October - 10 November.

CAMBRIDGE, Massachusetts

THE ART OF THE ETRUSCANS. SEHHEIMER'S ANTIQUE ARTS, 52c Brattle Street, 02138. Until 27 October.

NEW YORK, New York

AFFORDABLE ANTIQUITIES. DAEDALUS GALLERY, 41 East 57th Street. Until 20 October.

ANIMALS IN ANCIENT ART. Acridine Gallery, 970 Madison Avenue, 10021. Until 15 December.

FATHER DEITIES: DAEDALUS GALLERY, 41 East 57th Street. 20 October-30 November.

ONE THOUSAND YEARS OF ANCIENT GREEK VASES. ROYAL-ATHENS GALLERIES, 153 East 57th Street, 10022. Until 24 November.

TOURS

OCTOBER 1990

Diving and Archaeology. Turkey. 20-27 October. £350 (approx). University of Warwick, Dept of Continuation Education, Coventry, CV4 8AT.

FEBRUARY 1991

DYNASTIC, ISLAMIC AND CLASSICAL EGYPT. Based in Cairo and Luxor, with optional extension for cruise or overland to El Amarna. 16-24 February. £830. Dept of Continuing Education, University of Warwick, Coventry, CV4 8AT.

MEETINGS & SYMPOSIUMS

OCTOBER 1990

5 October. Collecting and Investing in Fine Art. A one-day important conference, to be held in London, examining the practical, aesthetic, financial and legal issues involved in purchasing fine art. £300 per person, plus VAT. Contact: The Law and Business Forum, 26 Green Street, London, W1Y 3FD. Tel: (071) 499 8895; fax: (071) 499 4912.

OCTOBER 1991

7-11 October. Aegean History Conference. An international conference on archaeoastronomical research, to be held at Westprem, Hungary, organised by the Archaeological Institute of the Hungarian Institute of Science and the Archaeometry Working Group of the Academy's Westprem Committee. Contact: Ms Kata- lina Simpson, Archaeological Institute, Hungarian Academy of Science, PO Box 14, H-1250 Budapest, Hungary.

12-14 October. Burnt Mounds and Hot Stone Technology. An international conference to be held at the Heat House, West Bridgwater, UK. Contact: Dr M Middled, Sandwell Metropolitan Borough Council, Wiggmore, Telford, West Midlands, B71 1RZ, UK. Tel: 021-569 4025.

15-17 October. Putting Archaeological Theory into Practice. Areas to be covered include: key issues in current archaeological theory; examples and case-studies; integrated approaches; and institution developments needed to integrate theory and practice. Contact: J. Wood, Department of Archaeology, University of York, UK. Tel: 0904-652772.

16-19 October. Second Biennial Meeting of the Association for the Study of Marble and Other Stones in Antiquity, Leuven, Belgium. Contact: Professor Herz, University of Georgia, CAS/Geology Dept, Athens, Ga. 30602 Tel: (404) 352-2393.

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COURSES

The Conservation of Excavated Sites: New Approaches and Techniques. A course organised by the Getty Conservation Institute and the Department of Antiquities of Cyprus, to be held at Paphos, Cyprus, 5-16 November 1990. Contact: The Training Program, The Getty Conservation Institute, 4003 Glencoe Avenue, Marina del Rey, CA 90292, USA.

AUCTIONS

OCTOBER 1990


NOVEMBER 1990


MINERVA 41
GOLDSMITH’S, MINT OR JEWELLERY FACTORY?

A new interpretation of the wall painting from the House of the Vettii, Pompeii

Marvin Tameanko

The Vettii of Pompeii, Aulus Vettius Restitutus and Aulus Vettius Conviva, were once slaves, but by the time Pompeii was obliterated by Vesuvius in A.D.79, they were Roman freedmen and very successful businessmen. They occupied an older house in Pompeii which they had restored and partially redecorated after the earthquake of A.D.62. The house is one of the most notable buildings in Pompeii because of its distinctive architecture and the 188 wall paintings found there when it was excavated in 1895. Art historians believe that the style of some of these paintings, usually called the Pompeian Fourth Style, was influenced by the art work commissioned by the emperor Nero for his palace, the ‘Golden House’ in Rome.

In the large banquet room, or aedus, used to entertain guests, the excavators found a series of fine paintings arranged as a frieze around the walls of the room. A lower band on the wall contained small paintings of cupids, or ‘Putti’ as the Romans called them, performing the business operations or trades of different commercial establishments.

Cupids, pygmies and mythical creatures are frequently used to represent humans in Roman art. In other wall paintings found at Pompeii cupids are shown making bread, milking a goat and consortng with gods and goddesses. This imaginative substitution of cupids for humans created a fanciful and romantic picture in a fashionable art style which was imported into Italy from Alexandria, Egypt, during the first century A.D. These cupids are portrayed as cherubic figures with wings attached to their backs. Female figures in the paintings are portrayed as Psyche, the nymph who in Roman mythology married Cupid.

It has been suggested that these pictures represent the commercial establishments owned and operated by the Vettii and that the pictures are a form of visual boast about the size and scope of their commercial empire and the sources of their wealth. Such boastful pictures are very common among the Roman nouveau riche of the times. This may be considered less vulgar than but similar to a modern business mogul listing the names and showing all the buildings of his many companies on the letterhead of his stationery.

In the house of the Vettii the cupids are shown in separate pictures as wine makers, fullers (cloth makers), wreath makers or flower dealers, perfumiers or fragrant oil producers and as goldsmiths or perhaps striking coins. This last picture is very contro-
versal and today, 95 years after its discovery, it remains as a source of friendly disagreement among art historians, classicists and numismatists.

The picture, which is read from right to left, shows the cupids involved in some type of metalworking operation and business. Archaeologists immediately proposed that this was a goldsmith's shop because small premises used for working gold had been discovered at Pompeii. Also, from an election poster found on a wall, they knew that a goldsmiths' guild or aurifices universi existed in the city.

As interpreted by art historians, the picture shows on the extreme right two cupids working at a furnace. The one on the right is doing some work with a rod. Initially this was was thought to be a worker shaping a metal bowl but later it was decided that the bowl was actually the door of the furnace, so perhaps the cupid is stoking or tending the fire. It is recognised as a furnace because of the bust of Vulcan, patron god of furnaces and metalworkers, with his distinctive conical leather cap, sitting on the fire box.

The cupid at the left holds something in the furnace with a pair of tongs, and blows on it with a blowpipe to increase the temperature. Next to the furnace is a cupid sitting at a work bench which has caused the greatest problem for the scholars attempting an explanation of the scene. The cupid fashions something on a medium sized anvil with a small hammer, while nearby are two pairs of scales on a mast and a chest of round, finished articles.

In the centre of the picture is a cupid holding a pair of scales and weighing out an item for a seated cupid, presumed to be a customer. This purchaser is considered to be feminine by

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Wall Painting

many historians because of the large wings which have butterfly markings, like eyes, which suggest the butterfly-shaped wings of the psyches. The draped gown and what appears to be a necklace or torque around the neck of the figure reinforce the assumption that this is a woman. However, in a nearby picture of the cupids as perfume makers, a female customer is also shown, but she is portrayed fully and accurately as Psyche, the wife of Cupid, who is easily recognised by her feminine appearance, long gown and her special wings which are butterfly-shaped. The controversial large winged cupid is considered to be important because he/she sits on a well cushioned, ornate chair and the feet rest on a large padded stool.

The two cupids at the left are working on a massive anvil. One holds something in large tongs on the anvil while the other wields a heavy hammer, about to strike the object. This is a compilation of the usual interpretations by the scholars who believe that the picture portrays a goldsmith’s shop.

Further study of the picture led to a clearer recognition of the metalworkers’ methods and a positive identification of the tools pictured. All this suggested to numismatists and art historians that the picture may portray a mint striking coins. The most obvious clues were the two peacocks appearing as a decorative motif in a panel above the painting, and the heavy hammer, large tongs and anvil shown in the picture. The peacock was one of the symbols of the goddess Juno who was the patron deity, as Juno Moneta, of mints and coin makers, and in whose temple the first Roman mint was located. The hammer, tongs and anvil in the picture resemble exactly the tools portrayed on the Roman Republican denarius of T. Carisius, struck in 45 B.C. Carisius was an official government moneyer, responsible for the mint, and he commemorated his illustrious office by showing the head of Juno Moneta on the obverse and the tools of the mint workers on the reverse of the coin.

Aimed with these insights, Talford Ely wrote an article in the *Numismatic Chronicle*, the journal of the Royal Numismatic Society, Volume 16, Series 3, 1896, entitled ‘The Process of Coining as Seen in a Wall Painting at Pompeii’, in which he described the discovery and contents of the picture, and proposed the theory that it depicted the Roman method of coining. This article was published less than a year after the discovery of the picture.

The interpretation of the picture offered by the scholars who consider this to be a scene of coin minting and who followed Ely’s description is as follows. The two cupids on the right are tending a furnace heating the coin blanks; these are struck when hot and the cupids with the blow pipe is raising the temperature in the furnace. The cupid at the medium anvil and bench is adjusting the blanks so that they are the correct weight. He has two pairs of scales to weigh them and he has sample blanks in the chest on the bench to use as standard weights. The central figures are the mint master holding the scales and the government moneyer or monetalis who is responsible for the work and who is shown with larger wings, draped, seated on a cushioned stool and with a footstool because of his high rank. Finally, the two cupids on the left are striking the coins.

Critics of this interpretation suggest that no blanks or finished coins are shown near the furnace or the large anvil. They also state that the cupid adjusting the blanks would use a chisel, shears or file to remove the metal. The small hammer he uses could only be used to reshape the blank and not to reduce the quantity of metal. Also, they state that the sequence, reading from right to left, is wrong. The coins supposedly were struck hot from the furnace and an adjustment and inspection stage would occur before the heating and therefore be portrayed to the right side of and before the furnace.

This argument created dissent and the experts immediately formed two opposing camps, one supporting the ‘Mint Theory’ and others upholding the ‘Goldsmith Shop Theory’. The two groups consisted of prominent scholars who debated the interpretation of the picture over the next half century. One camp insisted that this was the portrayal of goldsmiths (aurifaces) or jewellers at work. The reasons were obvious. There was no mint in Pompeii, therefore the Vetti could not have been in the business of minting coins which was, anyway, strictly a government monopoly. There were several goldsmiths and jewellery shops discovered in the excavated city and this scene was typical of the operation of a jewellery

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**Denarius of T. Carisius, 45 B.C., showing the tools of the mint workers on the reverse. Syd. 582**

**The picture from the House of the Vetti as drawn in the *Numismatic Chronicle*, Vol. 16, Series 3, 1896, from an article by Talford Ely. It is an accurate and well drawn representation of the actual colour painting.**

**MINERVA 44**
shop including, so they claimed, an important female customer making a purchase.

Today, the arguments from both sides seem specious and lacking scientific reasoning. Michael Rostovtzeff, professor at Yale University and the foremost scholar in ancient Roman history of his time, in his definitive work, The Social and Economic History of the Roman Empire, (1957), used the pictures from the House of the Vettii and of the goldsmiths to illustrate his chapter on Roman business life in the times of Augustus (Plate XV). On this page, like a scolding primary school teacher, he admonished the scholars who supported the ‘Mint Theory’. He said, ‘It is strange that prominent scholars could seriously discuss the view that they represent not a jewellery shop but a mint’ (he then names his opponents). He finishes with, ‘What could a lady customer have to do with a mint?’ The fact that this statement was published is an indication of how intense the debate had become.

The ‘Mint Theory’ scholars refuted this argument with more convincing evidence. They pointed out that the tools being used by the cupids are not the delicate tools of jewellers. Taking up Rostovtzeff’s tone of voice, they asked, ‘who makes jewellery with a sledge hammer?’ ‘Besides’, they asked, ‘what are the peacocks of Juno doing in a goldsmith’s shop?’

The debate continued for many years and then subsided, but the residual interpretations of the two camps still show up today in numerous books and articles. A recent book, The Art and Life of Pompeii and Herculaneum, (1979), with authorship credited to the eminent historian and numismatist Michael Grant (although he only wrote the introduction) describes on page 122 the picture, which is not illustrated, as being of goldsmiths. Other numismatic scholars maintain in recent books that the picture is of an operating mint.

By putting aside the old debates and examining the picture with a ‘fresh eye’, adding some observations about Roman technology, and recalling ancient jewellery making methods, a new interpretation of the picture can be made. This interpretation relies on a sharper perception of the picture and a total accounting of all the elements clearly shown but often overlooked or neglected by the early scholars.

I propose that the picture represents a jewellery factory in Pompeii, owned by the Vettii, and that the factory specialised in mass producing die struck jewellery which was becoming common in the Roman world. The Romans were very familiar with the concept of stamping products other than coins. They stamped their names as trade marks and for advertisements on roof tiles, bricks, terracotta and lead pipes, pottery, lamps and even bread using metal, die-like stamps. By coincidence, the house of the Vettii was identified by archaeologists from their bronze name stamps found in the excavations. The idea of stamping out or die striking jewellery would be a natural development from the stamping and die making technology the Romans already employed for coins and other products. If this theory is correct, it is easy to see how both of the early interpretations of the picture as a goldsmith’s shop and a mint could have originated.

As background to this new explanation, it must be understood that at this time Pompeii was becoming an industrial city and many of its citizens were converting older houses into factories to produce cloth, garum (the Roman fish sauce condiment used like modern tomato ketchup), wine, perfume, flower ornaments and wreaths, bread, lava building stone or grindstones, and metalware. The Campania area around Pompeii was famous for its metalwork. The Vettii obviously grew wealthy from the innovative factories they owned and they bragged about it in the pictures on the walls of their house.

Jewellery stamped out of metal sheet with dies could be made economically, quickly, and in large quantities compared with casting, fabricating and other older techniques. The die striking of jewellery is used today for these very same reasons. Necklaces, bracelets and earrings were found at Pompeii made up of die struck gold or silver leaves, flowers, acorns, human figures, animals and other shapes such as domes and plaques. One such necklace consists of golden ivy leaves which were struck from dies.

The process of stamping out jewellery is quite old, probably originating during Hellenistic times about 300 B.C. The technique was developed from the same methods used for stamping metal and striking coins. If the Vettii were the first business men to introduce die struck jewellery into the south of Italy, they would have become very wealthy indeed.

If the picture does show a factory mass producing jewellery by die striking the parts, the scene could be interpreted as follows. The furnace at the right is the correct size for annealing pieces of metal in preparation for engraving as dies, or for use as raw material. Annealing is a process that softens metal by heating it, after which it can be cooled slowly and worked. The opposite process, to harden metal, is called tempering; it also uses heat, but the metal is then rapidly cooled by quenching in water. A blowpipe of the type used by the cupid to the left of the furnace is still used today by older and amateur hobby jewellers. It raises the temperature only high enough to solder items or to anneal metal.

The cupid sitting at the bench and anvil can now be easily explained if this is a factory for die struck jewellery. He is the die engraver, called a caelator by the Romans. His work area is painted in great detail and the artist faithfully recorded all the engraver’s equipment. The caelator sits on a cushioned stool, almost as fancy as the one used by the central cupid, and he also has an elaborate footstool, so he must be of high rank. None of the earlier interpreters of the picture have commented on...
marked upon this furniture, yet it is significant to the scene. If he was a worker adjusting blanks in a mint or making jewelry in a goldsmith's shop, he would probably be a slave and not entitled to such furniture. More likely, he would be standing. The only person who might qualify for such status, consideration and comfort would be a master artisan or engraver and probably a freedman.

This cupid holds a small hammer, similar to the type still used today by engravers, known as a chasing hammer, which is employed with punches and chisels to make dies. Before him in the chest are the dies he has partially or fully completed.

The twin pairs of scales mounted on a mast on the bench are shown in great detail. Roman scales mounted in this way are unusual and this is the only ancient depiction of such a device. Scales, which are based on the equipoise principle, are usually suspended freely at the arm by a central ring or hook to avoid interference with its true balance by any connected parts, such as a mast, which could create friction. A set of scales, properly suspended, is shown in the centre of the picture. I suggest that these are not scales but are magnifying lenses or glasses suspended over the work by the counterbalancing weight of the opposite pan. The lens on the left is perched over an engraver's jig or vice which is shown as a rectangular box below the pan of the scale. Other scholars have neglected and failed to interpret this element in the picture and I propose that it's similar to an apparatus used by engravers today. The modern piece of equipment is an engraving block, a type of peg vice or, in an older form, a bowl full of pitch and cement which, when heated, holds the work to be engraved. This frees both hands for the work. Today, a magnifying lens is suspended over the work on a flexible arm or worn over the head or in the eye socket of the engraver.

The pan-like object suspended over the block could not serve as a scale pan because it is shown so close to the rectangular box that when loaded, even lightly, it would sit on the box top. But it is about the correct height above the box to serve as a magnifying glass. Glass or rock crystal lenses are mentioned in ancient literature as magnifiers and 'burning glasses.' Many magnifying lenses have been found in excavations of ancient sites and such a magnifying glass, made of rock crystal and in a round gold frame which looks very much like the scale pan in the picture, found in 1854 at a gemstone engraver's shop in Pompeii.

The seated cupid in the centre of the panel is obviously a person of high position, probably the owner of the factory, perhaps one of the Vettii himself. It would serve the boastful purpose of the picture as well as the ego of the Vettii to be portrayed in the midst of the assembly line making the jewellery. The special larger wings set him above the other employees of the factory; the torque on his neck is also a symbol of his status. If the eye-like butterfly markings, a symbol for the female psyches, on the male-shaped wings of the cupids need to be accounted for, I can perhaps suggest that the Vettii, being freed slaves and sharing a household, may have been eunuchs. This combined symbolism of male/female wings may have been the artist's subtle way of flattering the Vettii. Being a eunuch was nothing to be ashamed of in the Roman empire where eunuchs often held the highest positions in the civil service and served as secretaries to the emperors.

The cupid standing before him and holding a pair of scales is the foreman or manager showing the owner the weight of the precious metal to be struck into finished products. Even today, the owners of jewellery factories personally keep control of the precious metals used as raw materials. The final two cupids on the left are striking the jewellery pieces using the traditional tools of hammer, dies, anvil and tongs used by coin minters. The parts are struck uniformly, using one die, so no lower die is seen in the anvil. The decorative peacocks at the top of the picture invoke the guardianship of the goddess Juno over this mint-like, metal striking process. The finished precious metal pieces are so small that the artist did not bother to show them in the scene. They would be assembled with links into jewellery by other skilled workers elsewhere, perhaps in small subcontractors' shops.

The correct sequence of events in a die-struck jewellery factory is fully portrayed in the scene. The metal for the dies or for the jewellery is being annealed in a furnace with a blowpipe; the caelator is engraving the dies; the owner and his foreman are checking the raw materials; and the fabricators are stamping out the finished products.

The picture depicts the work methods of both goldsmiths and coin makers, so both earlier theories are partially correct, but the scene can only be interpreted accurately and in proper sequence if it shows metal fabricators producing die struck jewellery. If this new hypothesis is correct, we will have to wait for the future discovery of other wall paintings, probably in Rome or Lugdunum in Gaul, the principal Roman mint cities, to find a documented, visual record of a Roman mint in action.

Notes
2. The most convenient illustrations of all these picture panels can be seen in A History of the Ancient World, Vol. II, Rome, by R. Rostovtzeff, Oxford, 1927, p.272, and in many other books on Pompeii.
7. Ancient literature referring to magnification devices include, Aristophanes, The Clouds, 423 B.C., Seleucia, Natural Questions, i, vi, 4 B.C.-63 A.D.; Pliny the Elder, Natural History, Book XXXVI, 67, 23-79 A.D.
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