

CONTENTS

First Words

PAGE 2

Letters and News

PAGES 3-6

The Development of Roman Villas in Sussex

DAVID RUDLING PAGES 7-9

Digging up an Air War

GUY DE LA BÉDOYÈRE PAGES 10-11

Roman Road Survey along Watling Street

PAUL WILKINSON PAGES 12-13



Field School Courses

PAGES 14-15

Membership Form

PAGE 16



The front cover: Richborough Roman Fort

It is likely that the Roman invasion force of AD 43 utilised the natural harbour at Richborough to build a defended supply base. Richborough lay on a small island south of Thanet and was connected to the mainland by a causeway. Rutupiae, as it was known, soon became established as the Roman army's main supply depot. A huge cross-shape of rubble which is the most notable feature today, once supported a triumphal arch, 20 metres high which symbolised the gateway to Britain. This archway, faced with marble imported from Carrara in Italy, and ornamented with bronze statues, was later plundered for its stone when the depot was fortified in the third century. Rutupiae rapidly expanded to become a thriving commercial settlement, famous for its oysters and well-known throughout the Empire as the main entry port to Britain. The Roman road, now called Watling Street was the most important road in Britain and left the fort through the west gate.

*A weekend course on the study of Roman roads in the vicinity of Richborough, and a weekend course on the Roman Forts of the Saxon Shore are just part of our extensive archaeological programme this year.
For further details turn to pages 14-15.*

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FIRST WORDS

Welcome to the Winter edition of Practical Archaeology. Our Summer and Autumn programme of courses has ended, and work had started before Christmas on creating our fourth year of archaeological day schools. For 2001 we will be running over ninety days of archaeological courses, including a Diploma Course in Practical Archaeology which will be launched this Autumn. New for this year is a four-day visit to Rome where the Imperial City will be our classroom on Roman studies. Only ten places are available, so it is essential to book early. Our courses on practical archaeology are proving to be more and more popular, with many enquiries from students from around the world being answered by accessing the course information held on our web site at: www.kafs.co.uk.

Field-work this year

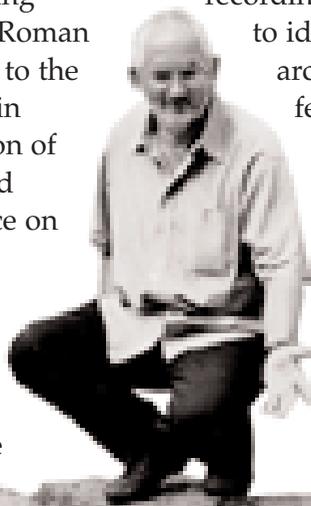
The highlight of the excavation weeks last year was the discovery and exploratory excavation of the Archbishop of Canterbury's residence at Teynham. The pottery has now been dated by John Cotter of the Canterbury Archaeological Trust from the 12th to 14th centuries (see *British Archaeology* October 2000). Work continued on the large Roman villa at Deerton Street and at Syndale another section was hand-dug through the fastigated Roman military ditch just below the brow of the hill. The last day saw the exposure of a large Iron-Age defensive ditch running diagonally across the hilltop with the Roman military ditch abutting it, very similar to the Roman invasion scenario at Hod Hill in Dorset. There was also the confirmation of extensive Roman building remains and cobbled surfaces, just under the surface on the hilltop but on top of the scarped Roman rampart at Syndale. It was so exciting that we even had a visit from 'Time-Team' who were interested in devoting a programme to the Field School's finds, but alas we

had already solved most of the research questions on this particular site! Also on the east side of the hilltop we exposed – after a geophysical survey – a remarkable stretch of buried Roman Watling Street with an associated street frontage of Roman buildings which may turn out to be the lost Roman town of Durolevum. Media attention was intense, Meridian Television ran a special news report on the Syndale 'dig', and most Kent newspapers carried the story. The story even made it into a end-of-year feature on Kentish news highlights of the year. The Field School had appeared on Meridian Television earlier in the year when we held a Graveney Boat weekend and Dr Gifford's Graveney Boat scale replica sailed on the same waters in the Swale as the original boat did some 900 years ago.

Best Practice

At the Field School we have found that field-walking to discover sites, followed by geophysical survey, followed by excavation by hand on chosen sites, and to a Research Design, is the most productive in terms of data recorded and artifacts retrieved, and the least damaging to the buried archaeology. This procedure is a world apart from what is happening in commercial archaeology where machine stripping of the topsoil is the norm. Unfortunately my experience on visiting many 'rescue' sites is that too much archaeology is being prematurely destroyed without adequate recording by the very process that has been set up to identify and record it. On many sites young archaeologists with little experience and fewer qualifications are left without adequate controls to fulfil tasks their site supervisors should be doing. There should be real concerns about what some commercial units are doing to our archaeology, because between them and modern farming practices an awful lot of rural archaeology is being lost forever.

Dr Paul Wilkinson, Head of School



LETTERS

From Jack Foulkes, Putney

I read with amusement Mr Hartley's letter on who was sitting in the JCB on the 'Time-Team' dig at Smallhythe. I think we all know who it was! And how 'Time-Team' escaped expensive litigation (or maybe they didn't!) is amazing. I have known of Brian and have nothing but praise for what he has done over the years for Kent archaeology. But I am very surprised that 'Time-Team' still continue to remove topsoil with a mechanical digger until, as Paul Wilkinson succinctly put it at a recent conference – 'we hear the satisfying crunch of steel bucket teeth on Roman masonry foundations'. I know everything is such a rush on 'Time-Team' but surely best practice has to be the removal and sieving of topsoil, as other countries, notably, France, Israel and the United States, practice on their archaeological sites. After all, these 'Dark-Age' levels are potentially the most important on Roman sites and numerous studies on the movement of ploughzone artifacts suggest this could be an important area of research.

From Gus Hawkey, Slough

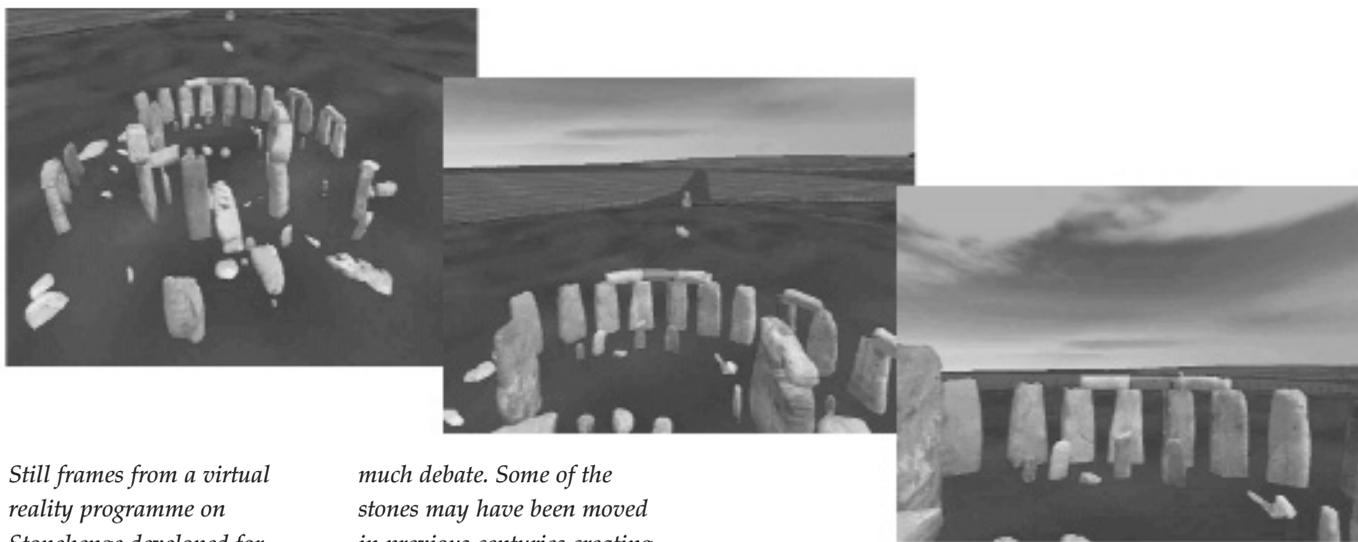
I was amazed to see on television the arguments that partial rebuilds of Stonehenge made it invalid as an ancient site. Surely a monument that old is bound to have been rebuilt, demolished, altered and 'restored'. After all, many important cathedrals have little of the original building in the surviving fabric, but that doesn't detract from the pleasure of visiting such wonderful monuments.

From Flo, London

I settled down to watch the extended 'Time-Team' programme from Canterbury, but to my horror most of the viewing time was cancelled because of cricket! This happens time and again on television with complete disregard to scheduled programmes. I was so upset I got in the car and drove the two hours to Canterbury to watch the unfolding saga live. As I was a recent beauty queen (Clacton 1962) I was able to persuade a lovely red-haired archaeologist from Canterbury to show me the sights and to my surprise I was invited to the 'Time-Team' end-of-dig bash held in a hotel bar in Canterbury. Needless to say the evening went with a wow, but unfortunately I had to leave at midnight in a bit of a hurry. Please don't give out my address as I don't want my shoe returned, but fondest memories to PB, TA, AW, MA, JD, all from C.A.T. and T-T., meow, meow!! playmates.

From Edmund Sharpe, York

I read recently in 'The Times' the story of the 'Woolly Whopper', a 23-ton of ice apparently the world's first complete prehistoric carcass for which the Discovery Channel had paid \$2 million. Is this a true story? Or is it just part of the hype? Should we be forming judgements on newspaper reports? Or even what we see on television? How true are some of the history or archaeological programmes we see? Have we lost our way in being informed on important discoveries?



Still frames from a virtual reality programme on Stonehenge developed for English Heritage. This famous ancient monument has recently become the subject of

much debate. Some of the stones may have been moved in previous centuries creating the site as it now stands. Have these changes made it impossible to study the site?

NEWS

Has Brian Philp solved the mystery of Noviomagus?

Back in 1966 Brian Philp, a Kent archaeologist who lives at West Wickham, says he discovered the lost Roman town of Noviomagus whilst field-walking near his home. Trenches were dug and traces of wooden buildings and internal buildings found. Mr Philp is reported to have said that the site fits the 'Antonine Itineraries', that well-known Roman travel guide written, most likely, by a Roman government official in the 2nd century AD. Mr Philp explains that for the West Wickham site to fit the distances recorded for Noviomagus the route probably went into Roman London and then south to Noviomagus. Mr Philp has kept his theory secret for some 34 years because of the likelihood of treasure hunters descending on the site and picking it clean. Support for the theory has come from Sheppard Frere, the Emeritus Professor of the Archaeology of the Roman Empire at Oxford University.



This early OS map shows the position of Wickham, Wickham Green and West Wickham. Although the Roman road postulated by Mr Philp has not survived as a topographic feature it is worth

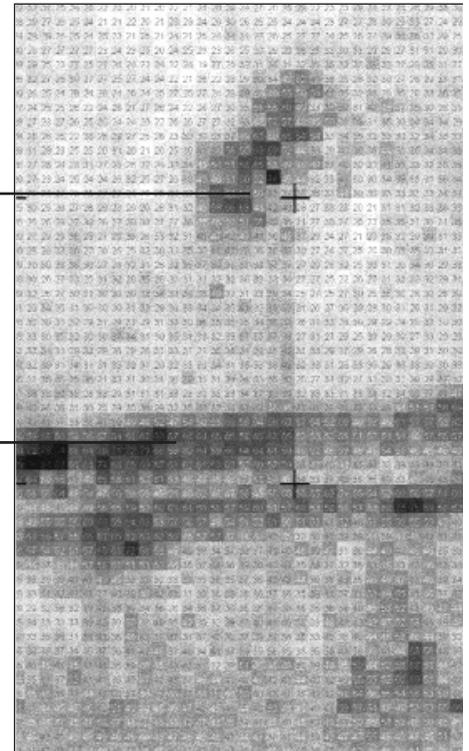
noting the spread of the place-name Wickham (from the Latin word 'vicus' meaning settlement), which suggests there was a large Roman settlement in the vicinity of these three place-names.

Roman Watling Street found in a field in Kent

Field-work, including a geophysical survey, has identified the original, lost route of Watling Street just to the west of Faversham. Students from the Kent Archaeological Field School spent a weekend excavating a section across the buried road which runs parallel to but south of the modern A2. The Roman road surface was in extremely good condition and consisted of coarse sand mixed

Print out from the geophysical survey conducted by Malcolm Davies as part of research of Syndale Park initiated by Dr Paul Wilkinson.

The buried destruction 'halo' of stone buildings (right) is apparent on the plot, as are the buried remains of the Roman road now called Watling Street. It had seemed from the geophizz plot that the Roman road (right) was worn out by post-Roman use, but excavation has shown that the road was in pristine condition and had been literally abandoned overnight, with Roman debris and coins littering the surface of the Roman road.

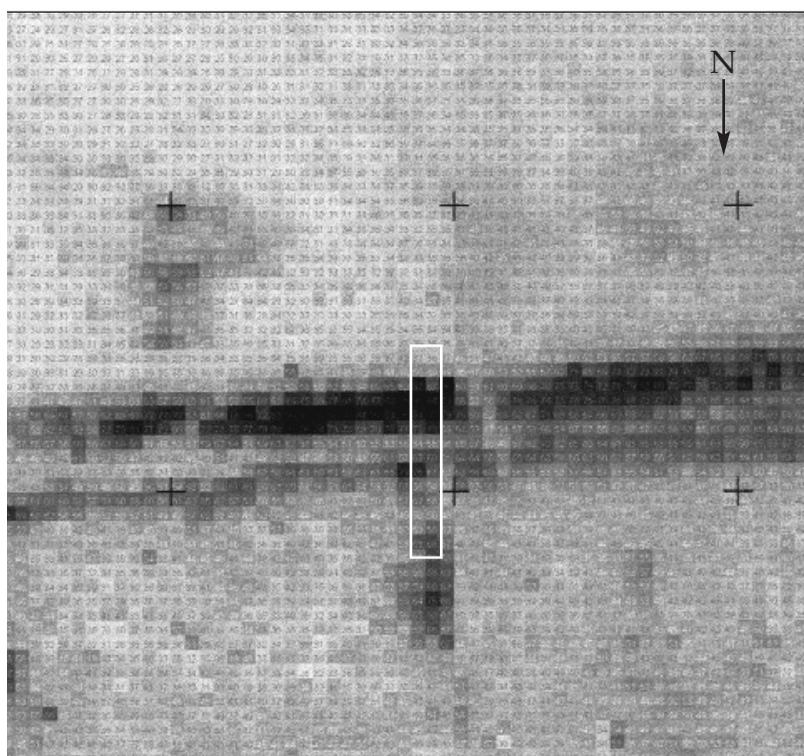


with fine gravel. Large flint stones had been used as a retaining kerb, and incidentally show up extremely well on the geophysical survey undertaken by Malcolm Davies. Sitting on top of this Roman road surface were some 14 Roman coins, two of which were silver. It seems the road was intensively used and then immediately went out of use at the end of the Roman period, suggesting a complete breakdown of Roman communications in this part of Kent. The road had not been used in the medieval, post-medieval or modern period, and was found buried under almost a metre of soil. The new road had been realigned some 10 metres to the north at an unknown date. On the north edge of the road was

NEWS

found the frontage of a substantial stone-built Roman building with stone-carved classical architectural details. In the doorway leading directly on to Watling Street student excavators found large pieces of a broken Roman pot and a quern stone, and just inside the entrance and sitting on the cobbled floor were the remains of a Roman hob-nailed boot. The archaeological evidence suggests this building had been abandoned in some hurry, with household artifacts scattered around. The geophysical survey

Roman coin and foundations deeply buried under alluvial material 600 metres to the north of Watling Street. Given the unusual number of Roman burials in Dressel Romano-Spanish amphoras found in recent years along this stretch of Watling Street, it can be suggested that this new discovery of Roman foundations may indicate the location of a Roman port which served the early Roman fort at Syndale and the Roman communities along Watling Street, of which the imperial posting station at Durolevum was one.



The white rectangle (above) shows where a trench was dug by students of the Field School. The dark area at the northern end of the trench is a Roman

building fronting directly on to Watling Street. A Roman boot, pottery and a quern stone were abandoned on the cobbled floor surface of the entrance opening.

indicates numerous other Roman buildings in the near vicinity. Some of these Roman buildings will be hand-excavated down to their preserved remains this year by students from the Kent Archaeological Field School. Field-walking, again by Field School students, has recovered sufficient data to suggest the main area of Roman settlement is to the north of Watling Street, much closer to the sea, and a test excavation has uncovered a



Students from the Kent Archaeological Field School digging the excavation trench at Syndale Park. The view is to the south, and in the foreground work is in progress in excavating part of the

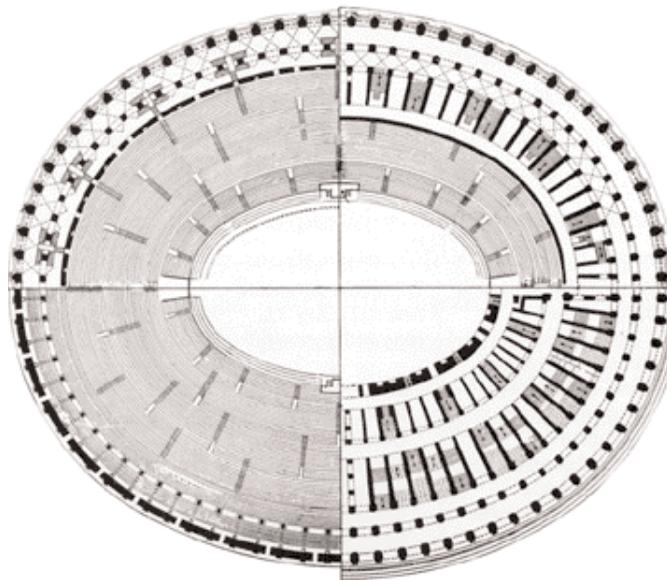
Roman building which fronted directly on to the Street. Without the use of geophysical survey it would have been impossible to focus on an appropriate area for detailed archaeological investigation.

NEWS

Did female gladiators fight in Britain?

Archaeologists have recently found remains of a woman gladiator from Roman Britain. A small fragment of pelvic bone from a grave being excavated in Southwark, London, suggests that the occupant of a highly unusual 'high-status' burial was a person of importance, and given the location of the burial, outside a cemetery, she was outside a cemetery. A pottery lamp buried with her had the image of a fallen gladiator. Three more were decorated with the Egyptian equi-vent of the goddess Mercury. When a gladiator was killed slaves dressed as Mercury would drag the body out of the arena. Jenny Hall, Roman curator at the Museum of London, said: 'Gladiators were never quite seen as members of normal society and seem

always to have been buried outside cemeteries'. That, plus the gladiatorial images, seems to suggest we have a female gladiator. But the discovery has caused a fair amount of academic cynicism. Many academics are sceptical about the museum's claim of finding evidence for a female gladiator. One leading authority on Roman women, Dr Mary Beard, of Cambridge University's faculty of



The plan of the Colosseum (above) shows the seating arrangement and the vast network of underground rooms and passages. The Colosseum was built on the site of a huge lake planned to enhance the

amenities of Nero's Golden House. Mosaics (top) show some of the wild beasts and gladiators that fought in arenas throughout the Empire. Up to 9,000 animals were killed in a single programme.

Arena found near Rome

British archaeologists have recently discovered a buried amphitheatre near Rome which they think was used exclusively for gladiatorial displays. The unknown arena was found at the Roman town of Forum Novum, 45 miles north of Rome. The existence of the town, which was first mentioned by Pliny the Younger, has been known for some time, but it was never excavated. A team of archaeologists led by the British School in Rome began a geophysical survey some three years ago and were dumbstruck by the sheer quality and scale of buried remains. They said the oval stone arena measured almost 300 square feet, or about one-eighth the area of that of the Colosseum in Rome, which held about 75,000 spectators. In Rome, the Colosseum is being restored and by May 2001 the arena's subterranean sections will be ready for a huge exhibition on gladiators. It is also hoped that a section of the *velarium*, the huge canopy that protected the crowd from the sun, will also be in position.

THE DEVELOPMENT OF ROMAN VILLAS IN SUSSEX

An examination of the development of Roman villas in Sussex as an aspect of the impact of the Roman conquest in the region. This is a precis of an article by David Rudling for the Sussex Archaeological Collections.

The Roman conquest of Britain in the 1st century resulted in dramatic alterations to this island's social and economic environments. The results of these changes, together with equally major changes in technology, make the period of Roman occupation one of the most distinctive and dynamic episodes in the history of south-east England.

The Conquest and the Client Kingdom

Soon after the invasion, the Romans established in southern England a client kingdom consisting of part of Sussex, and probably also other areas to the north and west. Tiberius Claudius Togidubnus became king between AD 43 and 52, and was probably dead or retired before AD 78.

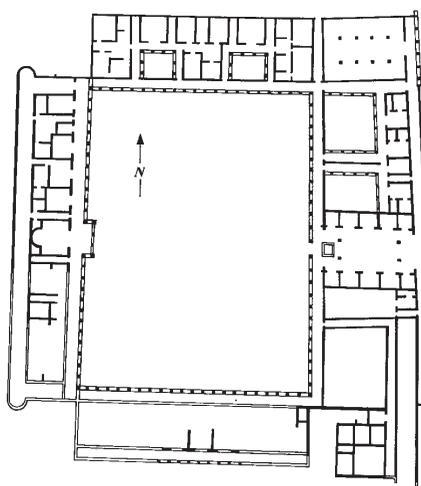
According to Tacitus, the king remained loyal to the Romans for a long time, and it is clear from archaeological evidence from Sussex that during his reign he was fairly successful in introducing elements of Roman culture into his kingdom – the famous temple dedication found in Chichester being an impressive example. In addition to the generally widespread acceptance and the distribution of products of Roman manufacture, such as coins and pottery, various other archaeological discoveries in Sussex also shed light on the processes of romanisation during the period of the client kingdom, especially so in Chichester which was clearly developing as a romanised centre. The undated dedication inscription referred to above is proof that there was a temple to the gods Neptune and Minerva erected with the permission of King Togidubnus, and paid for by a guild of

artisan craftsmen. Also, evidence for extensive areas of industrial activity may indicate a developing civilian market.

Romanisation (i.e. the adoption by the native Britons of aspects of Roman culture) during the period of the client kingdom was also occurring in the countryside. Sussex has a relatively large number of early villas and at least some may date from the reign of Togidubnus. These have been dated by finds of half-box tiles, the earliest type of wall-jacketing found in Britain.

Subsequently in the late 1st/early 2nd century new types of wall-jacketing were introduced. Finds of such tiles at over 15 sites demonstrate

both a considerable expansion of villa construction and alterations to earlier buildings. Who were the owners of these establishments, and what were the economic conditions which provided the finance for such building projects? It is probable that these villas were the property of the native aristocracy, which was 'left in peace to develop in the strongly philo-Roman atmosphere created by the client kingdom of Togidubnus' (Cunliffe 1973, 79). The wide distribution of



Plan of Fishbourne Palace

the large early villas may be very significant, with each located on a distinct block of land which may 'represent the territory over which the land-owning aristocracy held control' (Cunliffe 1973, 79). Could this pattern be a clue to one distribution of the tribal sub-units, the *pagi*, about which so little is known (Ernest Black pers. comm.)? In most cases the major source of wealth for the aristocracy would have been the sale of agricultural surpluses from the villa estates and

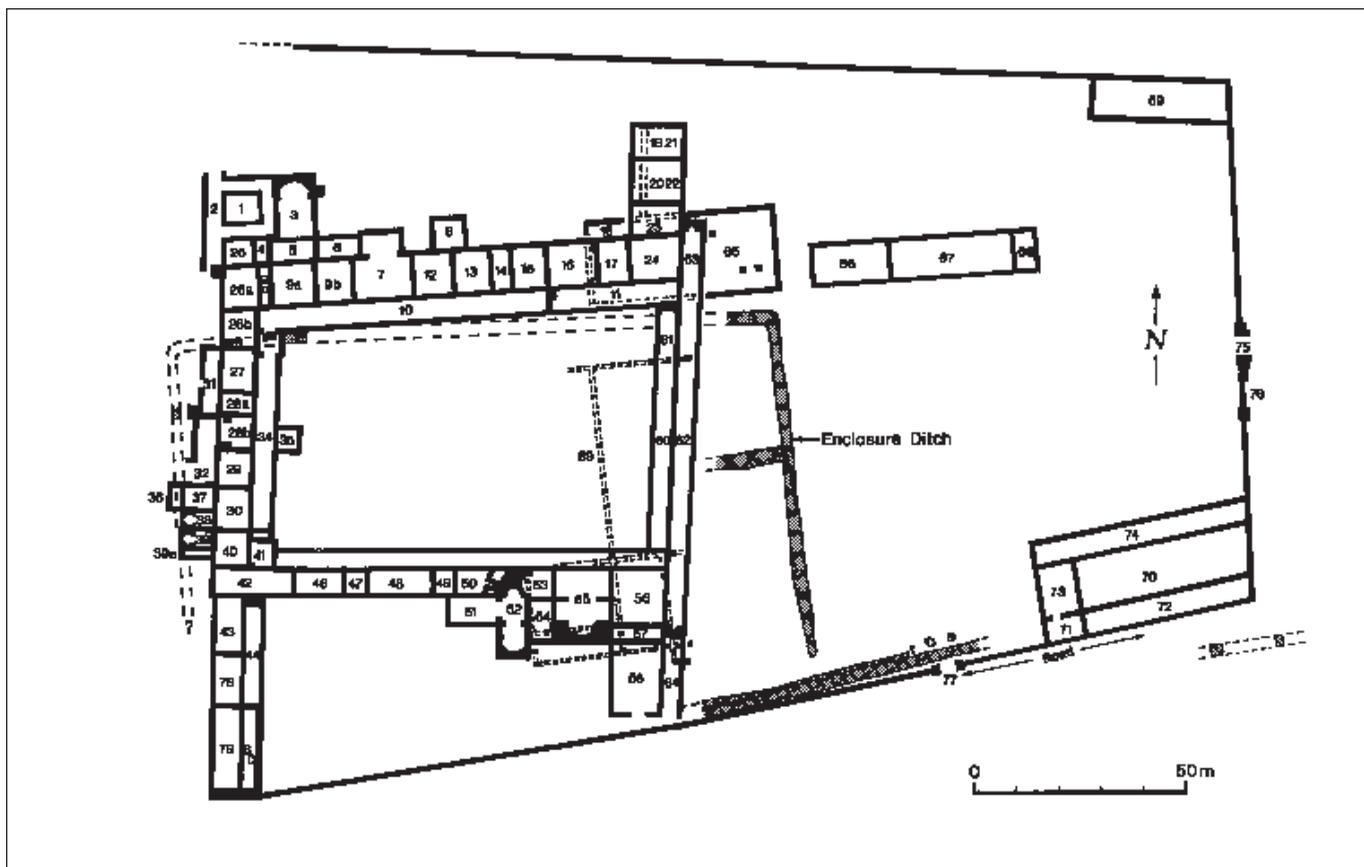
tenant farms. In some cases these sales may have included valuable military supply contracts (Black 1987, 17). Some of the villa developments may have been over-ambitious and later necessitated contraction, especially since the favourable economic advantages which are thought to have benefited the aristocracy of the Sussex area in the 1st century may have diminished in the course of the 2nd century (Black 1987, 34).

One may ask whether the motivation for early villa building in Sussex had been a competitive desire by prominent men to display their status in a new, romanised way. If this is the case, then these villas must have been displayed

to people who mattered, such as governors or procurators, or *legati iuridici* (Ernest Black pers. comm.).

Integration into the Roman Province

Following the death or retirement of King Togidubnus his extensive kingdom was integrated into the Roman province of *Britannia* and probably divided into three regional tribal units or *civitates*, to which various administrative functions were delegated. Much of Sussex, especially the areas to the south of the Weald where there were major 1st- and 2nd-century iron-workings, some associated with the *Classis*



The villa at Bignor is one of the largest in Britain. It is situated on the southern slope of the Upper Greensand, just to the north of the chalk Downs in West Sussex (NGR SU 987146). It is very close to Stane Street and therefore had good communications with the Roman markets at Chichester and London. The site was discovered in 1811 and extensively excavated until 1820. The illustration above is

a modern revised version of Samuel Lysons' plan of 1819. The first of the modern excavations was undertaken by Professor Frere between 1956 and 1962. In 1985 a programme of rescue and research excavations began, and ended last year. Room numbers 1-77 are based on Lysons (1819) and Frere (1982), numbers 78-80 have been added by Aldsworth and Rudling (1995).

Britannica, may have been separately administered as an imperial estate (Cleere & Crossley 1985, 66-9). If this was the case, it may help to explain the apparent absence of agricultural villas to the north and east of Eastbourne.

During the 3rd century the south coast became threatened by pirate raiding. This increasing problem may have been one of the reasons for the sudden end of the eastern group of large iron-working sites in Sussex (Cleere & Crossley 1985, 84-5) and the destruction and abandonment of some of the Sussex coastal villas, including perhaps the palace at Fishbourne.

Rural Farms

The basis of the Roman economy was land and its exploitation by farming to produce sufficient surpluses to support the more sophisticated aspects of Roman life: the towns, the luxurious country and seaside houses of the rich, large-scale manufacturing industries (such as pottery and iron production) and the army. One aspect of the Roman countryside that has received much attention is the villa. In archaeological terms a villa is usually identified by finding one or more of the following: masonry footings, multiple rooms, tessellated or mosaic floors, clay tiles/bricks, window glass, painted wall-plaster, hypocaust heating systems and bath-suites. It is often the presence of bath-suites that marks the difference between villa sites and the more numerous 'non-villa' farmsteads. Some of these farmsteads developed into villas, such as West Blatchington and Beddingham. Factors effecting expansion included ownership and fertility of the land, access to markets, alternative sources of income and suitable supplies of water.

The Development of Villas in Sussex

Many of the Sussex villas gradually grew out of local farms, with new buildings being of much the same size as the old, but built of stone rather than timber. Luxuries such as simple mosaics, baths and underfloor heating were occasionally added to these villas; examples include the late 2nd- to 3rd-century villa at Bignor and the two phases (late 1st-4th centuries) of aisled buildings at Fishbourne Creek. These villas are typical of the two main types of villas in Sussex and the rest of Britain: Bignor is a 'winged corridor villa' and Fishbourne Creek is an 'aisled villa'.

In contrast to villas that developed gradually, some grew rapidly, as in the case of the rich early villas discussed in the section on the client kingdom. These villas include Fishbourne, Pulborough, Arundel, Angmering, Southwick and Eastbourne, and possibly other sites at Newhaven and near Westhampnett Church. Some of these villas, such as Fishbourne, Southwick and Pulborough, are exceptional and are clearly derived from Mediterranean rather than North Gallic-type villas. The villas have some similar elements of design, construction and decoration, and may have involved the same architects and craftsmen. As there is little evidence of pre-conquest occupation at these sites it is likely that

the villas were 'imposed' on the Late Iron Age settlement pattern, and are presumably a reflection of the favourable political and economic climate of the client kingdom of the *Regni*.

Other major villa developments, as at Bignor during the 4th century, may have been caused by major changes in economic possibilities, by the merger of farms, or by immigration from elsewhere in Britain or abroad.

The Decline of Villas

The pattern of decline of the villas is complex. Some of the large early 'imposed' villas, such as Fishbourne Palace, may have been over-ambitious projects that contracted in the 2nd century, possibly due to social and economic changes. At the same time, however, there was a considerable increase in the building of new villas and it has been suggested that the profits of agriculture were now being 'shared amongst a larger number of landowners' (Black 1987, 34). This expansion of villa construction may have been linked to a decline in the power of King Togidubnus' heirs and nobles, especially if villa construction had formerly been restricted to the elite. Thus with the demise of the client kingdom more farmers may have aspired to live in villas, however humble in comparison with the large and luxurious 1st-century villas. In the 3rd and 4th centuries increasing inflation, pirate attacks on the south coast, and the establishment of a substantial military presence, may all have been factors which led to a large number of coastal villas being either deserted, as was Fishbourne, or contracted, as possibly at Beddingham. During this period, however, various villas located inland and away from both coastal raiding and military garrisons, as at Bignor and to the north of Chichester (and in Hampshire), were continuing to expand and develop. Finally, in the late 4th or early 5th centuries these villas too show signs of decay or abandonment. In contrast, some downland farmsteads show signs of continued occupation throughout the 4th century, and possibly into the 5th century. At Bishopstone occupation may even have continued into the Saxon period.

'The development of Roman villas in Sussex' by David Rudling is available as an offprint from Volume 136, of the Sussex Archaeological Collections. Price £3 (including postage) from the University College London Field Archaeology Unit, 1 West Street, Ditchling, Sussex BN6 8TS.

DIGGING UP AN AIR WAR

Guy de la Bédoyère introduces his new book, Battles over Britain.

It might seem strange to talk about events of only 60-odd years ago as being of archaeological interest, but of course all periods leave archaeological evidence. What makes the Second World War of such importance is that it subsists in living memory and this allows the archaeologist and historian to consider the evidence in the ground with the documentary evidence, and the personal testimony. But it's also true that the dramatic events of the air war of 1939-45 have left an indelible impression on British society. That includes the post-war generation which grew up in families where every adult had a tale to tell of dogfights, incendiary bombs, doodlebugs and air-raid shelters.

During the Second World War an average of five aircraft crashed every day somewhere in the British Isles.

Nowadays such events are, thankfully, rare enough to mean that when they do happen they make national news. But aircraft end their lives in only a few ways. They are scrapped, put into museums, or they crash. To this day, the hills of Wales, the Peak District, the Lake District and Scotland are littered with the crash-sites of flights which ended in tragedy, usually as a result of training missions lost in foul weather and misjudging height and location. In southern Britain, the remains are more likely to have been those of machines engaged in combat. Kent, for example, is home to hundreds of aircraft crash sites from the second half of 1940, a time known to history as the Battle of Britain. Small armies of aviation enthusiasts have poured vast quantities of money and time into digging out these relics and establishing private museums,

like those at Manston, Hawkinge, Headcorn and Shoreham near Sevenoaks. In many senses their activities resemble those of the 19th-century antiquarians – without them there would be practically no visible evidence of the air war at all now.

Archaeology and Records

Aviation archaeology is unusual in its capacity to associate deeply buried physical remains with documented history.

The vast majority of finds from wartime air-crash sites, and other pieces of evidence, are often rather

uninspiring. Air crashes consist very largely of piles of scrap metal. Built for speed and lightness, a 1940s fighter aircraft was very strong when going in one direction (that is, forwards), and weak when going in any

other. The trauma of impact normally wrecked the airframe, while fire could easily reduce much of the light alloy metal to powder. Where possible, the wreckage was removed at the time. Perhaps recovering or excavating the remains of these machines is a pointless activity. After all, we often know a great deal about the incidents because they are generally well recorded, or so it might be assumed. That is frequently not the case at all. Records are often incomplete, and local memories muddled. When the research is done and the remains recovered and removed to a museum, another episode in human history returns to the public domain. This is, after all, part of what archaeology and history are all about. Both provide us with the means to reach out to the past and to touch and sense it.



Wreckage of Spitfire I, P9373 uncovered in a field in France. The force of impact has

compressed the complete fuselage into a stack little more than 1.5 metres high.

The potency of the air war lies in its intoxicating mix of horror and bravery, as human beings were pushed to the very limits of their endurance during a conflict still affecting all our lives. This is no less valid a reason than the more self-conscious efforts by 'conventional' archaeologists to justify their activities. I have witnessed a number of 'normal' excavations but none was as compelling an experience as the recovery of a Spitfire in the company of the pilot's brother and one of his colleagues who had been there on that fateful day in 1940. Instead of just silent artifacts we learned about the life of one man and how the chaos of one day led to his death.

The Tragic Crash

Paul Klipsch was a sergeant pilot with No. 92 Squadron in the spring of 1940, flying Spitfire Mark I fighters. On the 23 May he and his colleagues were sent into battle against the Luftwaffe, then hell-bent on wiping out the British forces trapped at Dunkirk. Klipsch was shot down and killed over the village of Wierre-Effroy in the second sortie of the day. His war had lasted less than 12 hours. Villagers watched as the stricken machine plummeted out of the sky and powered into the corner of a field, while children gathered spent shell-cases as they rained down on houses in the village. The wings scattered on the surface but the fuselage of Spitfire I, P9373, was dragged into the ground by sheer force.

As it entered the soil, the steel internals of the Rolls-Royce Merlin III engine seized and exploded out of the soft alloy casings. The engine quite literally exploded but it was still moving with such force that the aluminium airframe was dragged several metres into the ground, collapsing around Klipsch's body as it did so. Villagers gathered round and removed the man's body, burying him later in the village churchyard.

The 'Time-Team' Excavation

It was not until the late 1990s that aviation enthusiasts Alan and Anita Brown came to look here, finding a fragment of metal with the serial no. P9373. The 'Time-Team' excavation followed when series producer Tim Taylor asked me to find a Spitfire for the show to excavate. I spoke to Isle of Wight-based Steve Vizard who has used his experience of aviation digs to run a factory producing new parts which keep working Spitfires alive. For me, the experience was

overwhelming. On Day 3 of the excavation the pulverised remains of a Spitfire were revealed, and we could see how just a few decades had seen much of the magnesium-based alloy crumble to powder. Highly unstable, the plane was used for its lightness but it decayed in use, let alone in the ground.

With me was Allan Wright, who had flown with No. 92 Squadron on the day the P9373 went down, and could tell me what it had been like on that first chaotic day in battle. His own log-book records that he flew P9373 himself when it was new to the squadron, testing it out for use. Paul Klipsch's half-brother, Eric Wynn-Owen, was there too and talked of the man he remembered fondly as a playmate. Locals showed the shell-cases they had treasured ever since the day of the crash.

This showed me how bereft we archaeologists are of the true human experience when we excavate. This man was a real person, known to those present as a friend, colleague and brother. We could assess the meaning of his loss, something which is usually impossible to calculate when faced with an anonymous skeleton. The whole random set of circumstances which had combined to create the archaeological feature was available to us. It was moving, instructive and utterly priceless as an experience, quite apart from the enormous privilege of being there at all.

Yet access to this information is all running out right before our eyes. Within 10-20 years the living memory of the Second World War will have gone forever. In the vast arid plain of archaeological anonymity the relics of the air war stand out as monuments to an extraordinary period in our history. It is one which does not fail to move and fascinate visitors to the museums which have sprung up across the country to house the relics of those who fell to earth in the last great war.

And me? After the dig I learned to fly, gaining my own pilot's licence in January 2000, flying out of Biggin Hill. The greatest compliment of all is when a wartime pilot talks to me about his first solo as one pilot to another. It's as good as meeting a Roman soldier face to face, or at least it would be!

*Guy de la Bédoyère is an archaeologist and historian. He has published numerous books including *The Golden Age of Roman Britain* (1999), *Companion to Roman Britain* (2000), *Voices of Imperial Rome* (2000) and *Battles over Britain* (2000) for Tempus.*

ROMAN ROAD SURVEY ALONG WATLING STREET

On May 5th, 6th, 7th, the Kent Archaeological Field School will locate, survey, and excavate part of the Roman Watling Street near to the fort and town of Richborough.

Roman land surveyors, the civilian *Agrimensores* and the military *Mensores*, were highly trained in the precise skills of geometry and measurement. Land was usually set out on a square grid, tied into Roman roads. Roads would provide a geographic reference to land and estate division, with a plot being located by referring to a specific milestone along a particular road together with the required distance, left or right. Frontinus used this approach when locating and mapping the sources of water which fed the aqueducts of Rome.



Roman surveyors using the groma

Surveying Instruments

A variety of surveying instruments would have been used by the Romans, including the *groma*, a device for establishing a survey line which is a continuation of, or is at right angles to, an existing line. The *dioptra* was used for measuring horizontal angles, for plan surveying, vertical angles and for levelling. Vitruvius recommends use of the *dioptra* for designing water-supply systems, and Pliny the Elder mentions its use in astronomy. The portable sundial, using a upright *gnomon*, could be used to find true north and south. Vitruvius describes the instrument in some detail. He tells us that in order to find north, describe a circle into the ground and push a stick (the *gnomon*) vertically into the centre. The stick's height must be such that the end of its shadow in the early morning and late afternoon lies outside the circumference of the circle, but inside at midday. Once in the morning and again in the afternoon, the end of the shadow will just touch the circumference. Vitruvius tells us to join these

points thus obtaining a chord. Then, draw a line from the centre of the circle which bisects this chord, and this line is true north.

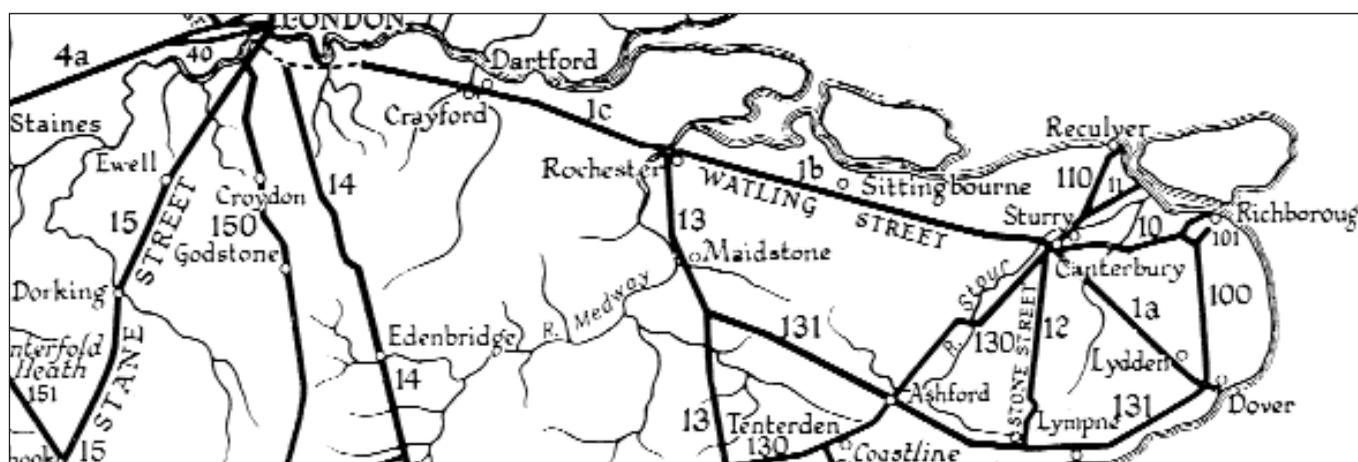
To take the use of this instrument a stage further, consider the ordinary garden sundial. This consists of a circular horizontal plate, engraved around the edge with the hours of the day. Sticking up in the middle of the plate is a triangular piece called the *gnomon*. If this *gnomon* is lined up accurately on the true north, its

shadow cast by the sun will indicate the correct time on the scale at the circumference of the horizontal plate. If the instrument has been disturbed and is no longer lined up on true north, this can be remedied by simply reversing the process. Note the time from a watch and rotate the sundial until the shadow of the *gnomon* coincides with the corresponding time on the circumference of the brass circle. The *gnomon* is now back to true north and the instrument has been used not as a sundial, but as a sun-compass. The Roman sun-compass is not a complex piece of equipment. It consists of two concentric circular bronze plates, one slightly smaller than the other. The larger one has an eye, obviously used for the suspension of the whole instrument. Both plates are mounted on a common pivot, together with a peculiar-shaped *gnomon* that rotates freely. The edge of the larger plate is marked in tens of degrees, and these figures obviously represent latitude. The inner plate has four segments of $23\frac{1}{2}$ degrees which can only represent the declination of the sun. This varies from $23\frac{1}{2}$ degrees south (in midwinter) to $23\frac{1}{2}$ degrees north (in midsummer). At the equinoxes, declination of the sun is zero. The

gnomon has a shadow-bar at one end and pointers at both ends. The curved surface of the *gnomon* is etched with marks representing the hours. To operate the instrument, suspend it from a tree branch, making sure it is not in shadow; take the time (the Romans would have done this with an hour-glass); set a raised marker on the inner disc against the latitude on the outer plate; align the point on the shadow-bar end of the *gnomon* against the declination of the sun scale. This is easily worked out from the date, but is usually calculated in advance and written down in a handy chart. Then rotate the whole instrument around a vertical axis (the axis of the suspension string) until the shadow of the shadow-bar lies along the hour mark on the *gnomon*, which corresponds to the time indicated by the hour-glass (or the modern observer's watch). The instrument is now lined up exactly with true

until a suitable route was arrived at. The other method uses right-angled traverse lines of known length. The distance and angle of the proposed route can then be worked out. When obstacles such as rivers occur, the triangulation method of survey (mentioned by Nipsus) may be used. The traverse lines can be permanently established in the landscape with stone markers, which could also be used for plot survey and division.

To measure the distance between way-points, a *h odometer*, as described by Vitruvius, could have been used. It consists of a wheel which turned cogs to record rotations, and so indicated the distance travelled. However, even if such a instrument worked, Roman army soldiers were trained to march at a steady rate of 1,000 paces to a Roman mile, and these ancient armies had a *bematistae* whose job it was to record exactly the daily distance covered by a legion.



Roman roads in East Kent radiate from Canterbury the tribal capital of Kent, to the main Roman ports of Reculver, Richborough, Dover and

Lympne. From Canterbury Watling Street runs in a almost straight line to London passing through Ospringe, Sittingbourne and Rochester.

north, not the magnetic north, but the geographical meridian and the North Pole. This is how the Romans managed to survey their roads so accurately.

Road Planning

There are two well-known, and much argued about, methods of survey which could have been used by the Romans in long-distance road-planning. The first is successive approximation, in which two survey teams with beacons map out way-points from either end of a proposed road alignment. When the two teams met up, they would assess how far from a straight line they were and progressively adjust the way-points

Recording Routes

All the survey information in the field would no doubt have been recorded on wax tablets. Each survey team would need to input this information on to a true-scale master plan, probably using the concrete floor of a large room to draw it out. Once the two ends of the road had been linked by the survey lines, the lengths and bearings of the various sections could be laid out taking note of difficult terrain and river crossings. The finished survey line (base line) could then be used to plan the route of the proposed road using measured right-angled offsets from the survey line. It would make the task of planning road routes easier if straight sections, changing alignment at high points were used. Thus it seems that it is the mathematical practicalities of survey that dictated Roman roads seem to have been made straight.

Paul Wilkinson

THE KENT ARCHAEOLOGICAL FIELD SCHOOL

*A full listing of archaeological courses held at Faversham in Kent.
The fee is £30 a day and if you become a member there is a 10% discount on full prices. To become a member fill in the form on the last page of the magazine. For further details access our web site at www.kafs.co.uk.*

April 7th, 8th, Prehistoric Kent

An introduction to the archaeology of ancient Kent. We will visit many of the very special prehistoric sites and monuments in the county, including Kit's Coty and the Coldrum Stones.

Easter, April 13th to 16th, Excavation of a Medieval Palace

Recent fieldwork and excavation by the Field School at Teynham has found a large medieval complex dating from the 12th century. We will spend four days of the Easter bank holiday extending our knowledge of the site by excavation, landscape studies and geophysical survey. Member's special fee £22.50 per day.

April 21st, 22nd, Archaeological and Geophysical Survey

A course on the theory and practice of archaeological and geophysical survey utilising laser technology, optical site levels and theodolite. There will be the opportunity to learn how to build your own geophysical meter.

April 28th, 29th, The Past from the Air

Prehistoric ditches, Roman roads and buildings, are all hidden in the landscape but can clearly be seen from the air. On Saturday an expert from English Heritage will describe the types of aerial photographs and the skills needed to interpret them. On Sunday we will fly over the Kent landscape in a hot-air balloon. Course for members only, the price of £160 for the weekend will include all flight costs and champagne.

May 5th, 6th, 7th, The Study of Roman Roads

Last year we successfully located, excavated and recorded a section of Watling Street at Syndale (shown on Meridian Television). Over this bank holiday we will locate, survey and excavate the lost part of the Roman road by the fort and town of Richborough.

May 12th, 13th, Bones and Burials

Osteo-archaeology is the study of human remains. The course will be led by Trevor Anderson, consultant to Canterbury

Archaeological Trust, who has appeared on 'Meet the Ancestors'. The course will cover the on-site recording of human remains. Excavated skeletons will be available for study and analysis in practical sessions.

May 19th, 20th, The Saxon Shore (Litus Saxonicum)

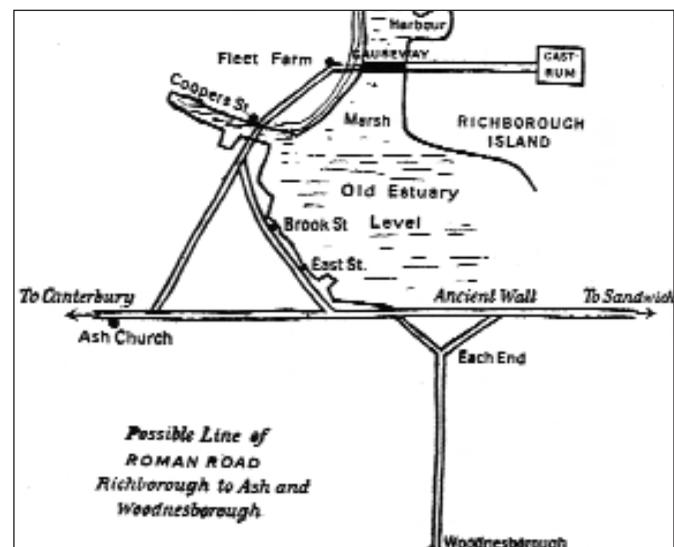
The purpose of the Roman forts of the Saxon Shore has always been a matter of debate, but recent archaeological research has thrown new light on the forts and their historical context. Dr Wilkinson will discuss why the forts were built, when, as a defence against whom, and how successful they were. We will visit the Roman forts at Reculver, Richborough, Dover and Lympne.

May 26th, 27th, 28th, Discovering Archaeological Sites

We shall look at the ways in which archaeological sites are discovered and excavated and how different sorts of techniques are used to find sites. During the three days we will try to locate an unknown Roman archaeological site in the very best traditions of 'Time-Team'.

June 9th, 10th, Stone Tools in Archaeology

A practical weekend course on the identification of Palaeolithic worked flint and stone. We will look at the



technology used to produce prehistoric implements and try flint-knapping for ourselves. The course will be led by Terry Hardacker and William Lord.

June 30th to July 20th Excavation of a Roman Bath-house

There will be three seven-day sessions spent in the field excavating a bath-house attached to a high-status Roman villa complex. Techniques will be taught on site and will include the following topics – archaeological survey, Roman pottery identification, recording contexts, section drawing, excavation techniques, first-aid for finds, site photography, archaeological survey and drawing. Member’s special fee £22.50 per day.

July 21st, 22nd, Post-Excavation Analysis

A practical weekend course on how to wash and sort archaeological finds including pottery and bone. Member’s special fee £15 per day.

July 28th, 29th, The Anglo-Saxons

A practical weekend course on Anglo-Saxon jewellery and Anglo-Saxon place-names. On Saturday we will introduce Anglo-Saxon art and focus on their jewellery in terms of production and symbolism. On Sunday we will learn about Anglo-Saxon place names and tour the countryside to put them in context. The courses will be led by Dr Margaret Gelling and Dr Paul Cullen.

August 4th, 5th, Roman Agricultural Estates

The course will concentrate on how and why Roman villas played such an important part in the Romano-British landscape. In the afternoon we will visit Roman villa sites along the Swale and Darent, including Lullingstone Roman villa (entrance fee included).

August 11th to 26th, Excavation of a Roman Town-House

Recent geophysical survey has identified stone buildings alongside the Roman Watling Street at Syndale, just west of Faversham. These buildings are most likely part of the lost Roman town of Durolevum. We will spend 16 days excavating and recording these high-status Roman buildings in a course of discovery. Member’s special fee £22.50 per day.

September 1st, 2nd, Landscape Archaeology

We can trace the transformation of the landscape of Britain by using historic maps from the County Study Centres. On Saturday we will handle and interpret historic maps, and on Sunday will take copies of the maps into the field to find out how to locate lost historic and archaeological sites.

September 7th, 8th, 9th, 10th, Visit to Imperial Rome

Rome, built on seven hills and centre of one of the greatest empires in the ancient world will be our classroom for four days. Rome can only be savoured on foot, and only with an experienced guide. Dr Paul Wilkinson will take you on a walk through history – the Field of Mars, Trajan’s Column, the Forum, the Colosseum. This special course is available for members only, the fee is £485. For more details send for our information pack, or see www.kafs.co.uk

September 22nd, 23rd, Prehistoric Flints

A practical course on identifying and recording worked Mesolithic and Neolithic flints. We will field-walk various prehistoric sites to familiarise ourselves with flint artefacts. The course will be led by Chris Butler, Chairman of the Mid-Sussex Field Archaeology Team and John Lord.

September 29th, 30th, Archaeological Drawing

A weekend course on how to illustrate pottery, bone, metal and other artefacts found in archaeological excavations. Course led by Jane Russell, senior illustrator of UCL Field Archaeology Unit.

October 6th, 7th, Recording Vernacular Buildings

An introduction to building techniques and style in South-East England from 1200 to 1750. We will visit a number of buildings including the Great Barn at Littlebourne. Course led by Richard Austin of Canterbury Archaeological Trust.

October 13th, 14th, Interpreting Handwriting

This practical course, led by Duncan Harrington of the Kent Archaeological Society, will enable you to read and transcribe the many documents surviving from the medieval period to 18th centuries. These skills will help those wishing to carry out their own research projects.

October 20th, 21st, The Roman Mosaics of Britain

Course led by David Neal who, with Stephen Cosh, has compiled a description and illustration of every Roman mosaic discovered in Britain. On Sunday we will visit the famous mosaics at Fishbourne and Bignor (entrance fees included).

October 27th, 28th, Identifying Roman Sites

This field-walking course will show how artefacts on and in the ploughed surface and features in the landscape enable us to locate Roman sites. Course led by Dr Paul Wilkinson, who is a specialist in landscape studies. Member’s special fee £22.50 per day.

November 3rd, 4th, The Topography of Rochester

A weekend course on the origins of Rochester city, castle and cathedral. We will visit Rochester on both afternoons. Course led by Tim Tatton-Brown, Archaeological Consultant to Rochester Cathedral.

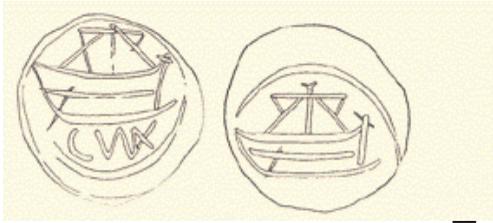
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 Graveney Road, Faversham, Kent, ME13 8UP.

MEMBERSHIP FORM



Practical Archaeology



September 7th, 8th, 9th, 10th, Visit to Imperial Rome

'Practical Archaeology' is published four times a year for members of the Kent Archaeological Field School Club. The annual subscription for a single person is £15. Membership for two adults is £25, and family membership (two adults and two children under 16 years old) is £30.

Membership will also entitle you to enjoy priority booking with 10% discount on courses at the Kent Archaeological Field School, except where special prices apply, and special 'members only' field days and trips.

Please return the form to:—
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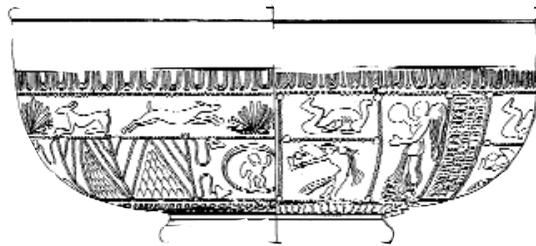
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FIELD SCHOOL



Certificate of
Attendance

This is to certify that Karly Walters successfully
completed the the course on 'Practical Archaeology',
AD 2000-2001 which included-
Archaeological Field Survey
Planning of Archaeological Contexts
Stratification, Section Recording
The Site Archive

.....
Dr Paul Wilkinson, Head of School

Kent Field Study Centre
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Telephone 01795 532 548
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