Safe roads, Reliable journeys, Informed travellers

HIGHWAYS AGENCY

A Road Through the Past
Archaeological Discoveries on the
Pepperhill to Cobham
A2

An Executive Agency of the Department for Transport

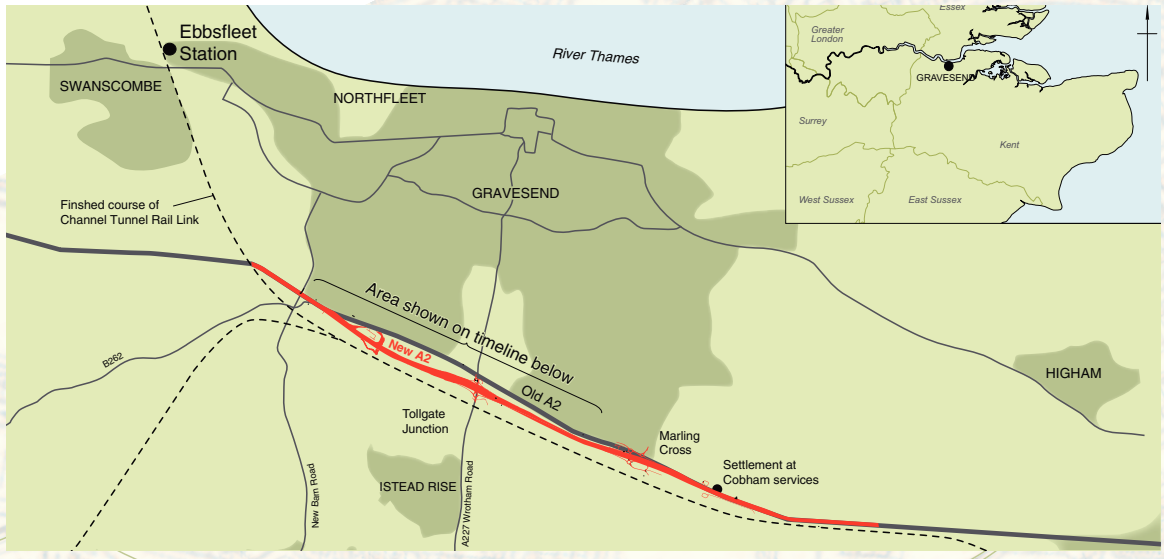
Background to the discoveries

Photograph taken in 1922 during construction of an earlier version of the A2 showing the surface of Roman Watling Street (courtesy of Kent Archive Service, Centre for Kentish Studies)

Archaeological excavations along the route of the A2 Pepperhill to Cobham Widening Scheme, near Gravesend in Kent, have uncovered a rich archaeological landscape reaching back 10,000 years. The discoveries include a sensational series of rich burials dating to around the time of the Roman conquest, which are amongst the finest ever found in Britain. Important evidence for prehistoric and medieval settlement was also found.

The excavations were carried out by Oxford Archaeology, working for Skanska on the £122 million Highways Agency scheme. Archaeological fieldwork was carried out over eleven months from September 2006. Analysis of the findings is being carried out and a detailed report will be published in early 2010. This booklet presents highlights of the findings to date.

The main area of archaeological investigation runs for nearly 3 km between Pepperhill Junction and Marling Cross Junction. It traverses two raised plateaux divided by a dry valley at Tollgate Junction (A227 Wrotham Road). Smaller-scale excavations were also carried out prior to the construction of two new drainage ponds adjacent to Cobham Services.



Late Iron Age boundary

New Downs Road

Pepperhill Junction

Line of new A2

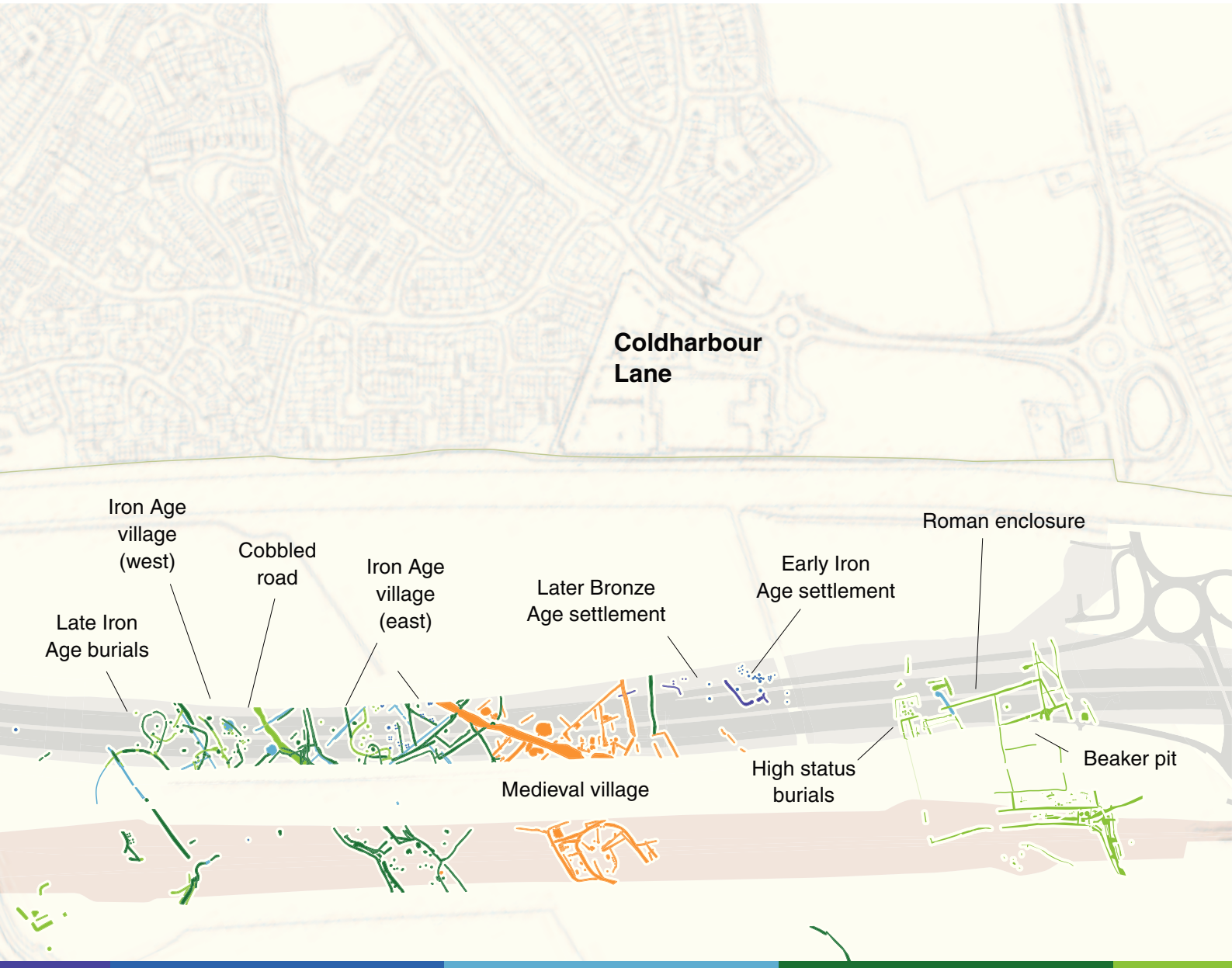
Saxon building

Channel Tunnel Rail Link

TIMELINE

Stonehenge

End of last Ice Age	Introduction of farming and pottery	'Beaker' people - first metal users	First farmsteads
MESOLITHIC 10,000-4000 BC	NEOLITHIC 4000-2400 BC	EARLY BRONZE AGE 2400-1500 BC	LATER BRONZ 1500-800 BC



Introduction of iron to Britain

Introduction of coinage to Britain

Wheel-made pottery

Roman conquest of Britain

E AGE
C

EARLY IRON AGE
800-400 BC

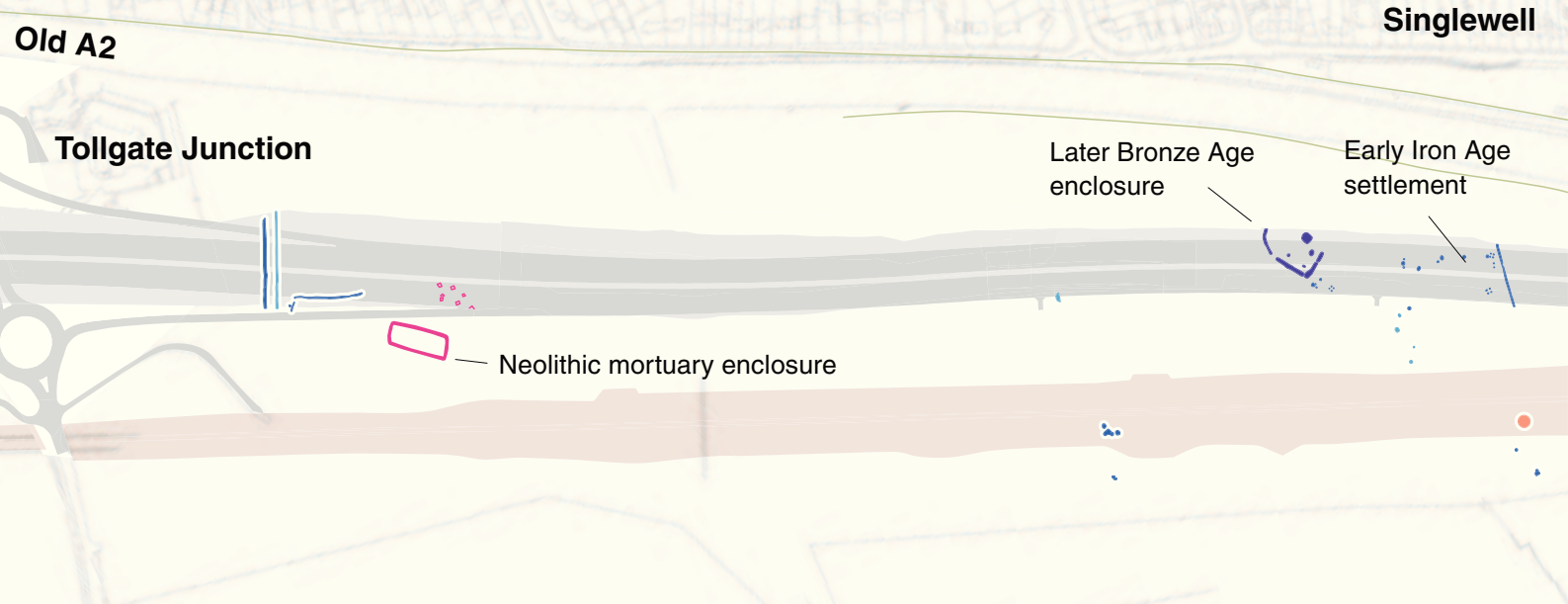
MIDDLE IRON AGE
400-100 BC

LATE IRON AGE
100 BC-AD 43

ROMA
A

Mid Kent
Golf Course

This booklet describes the discoveries from the earliest to latest in time, and the timeline gives a different colour to each time period. The edges of the pages of the book are coloured to show where to find details of the discoveries of each period. Archaeological features are shown coloured according to their age on the foldout plan. More detailed plans are included in each section. The areas investigated are shown as a grey tone, and areas investigated during the construction of the Channel Tunnel Rail Link alongside in light brown. All the objects in the booklet were found during the excavations, unless stated otherwise.



Angles and Saxons settle in Britain | **Battle of Hastings** | **Tudors** | **World War II 1939-45**

NO-BRITISH
D 43-410

SAXON
AD 410-1066

MEDIEVAL
AD 1066-1485

POST-MEDIEVAL
AD 1485-2000

Archaeological fieldwork:

discovering the past

Iron Age curving enclosure ditches and pits revealed by topsoil stripping, showing the darker and deeper feature fills

Earlier excavations for the Channel Tunnel Rail Link (CTRL), which runs just to the south of the A2, uncovered a series of ancient settlements, some of which continued north of the railway. This suggested that archaeology would also be found within the new road corridor. Before excavation began, surveys were carried out to help determine what we might expect. This included examination of cropmarks, a geophysical survey, and a field walking survey.

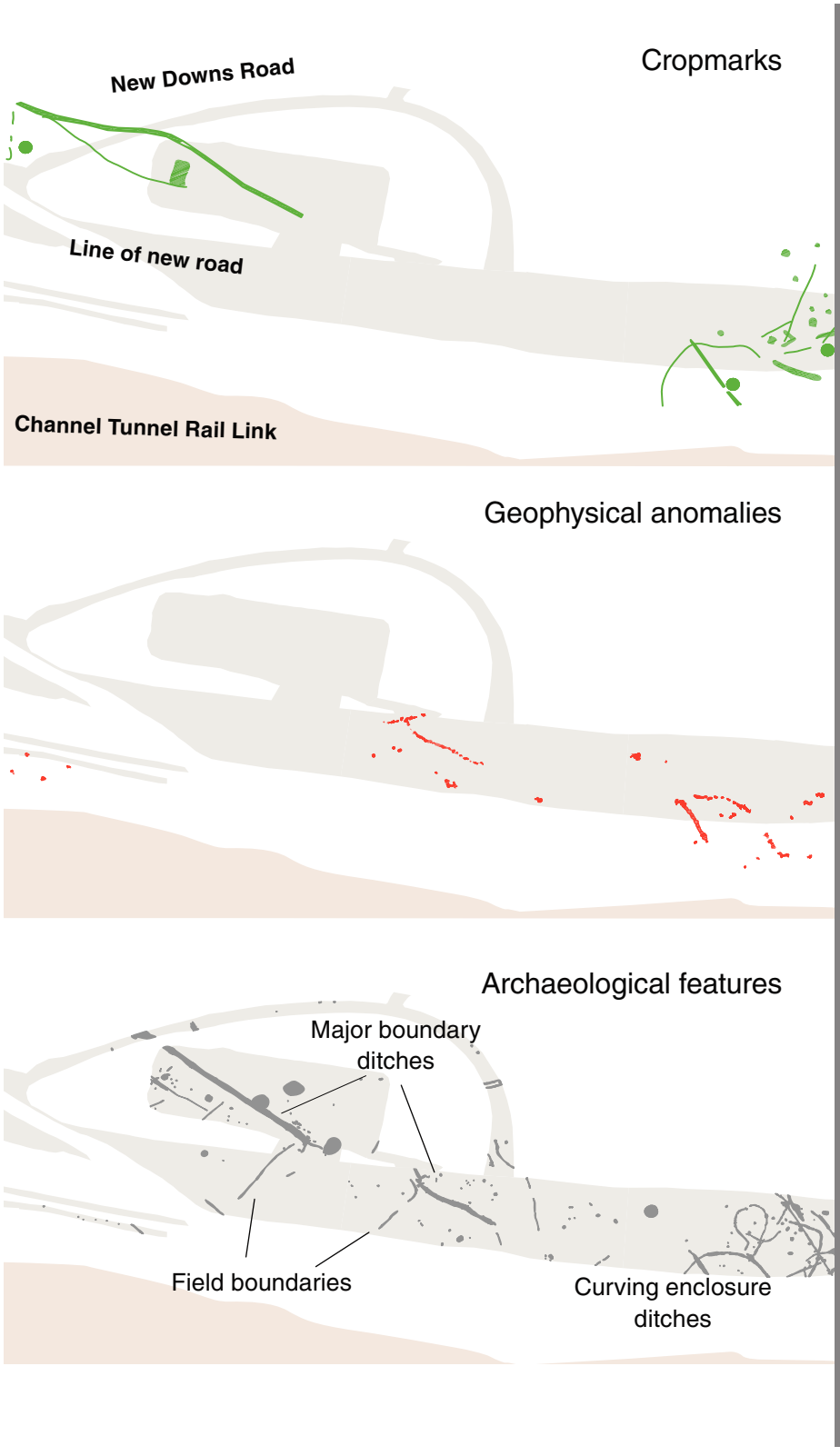
A metal detector survey was also carried out, and produced a few Roman coins and a medieval silver penny.

These surveys confirmed that there had been ancient settlement along the road corridor, though they gave no indication that dense archaeology would be found. The A2 excavation began by removing the topsoil along the entire route. This revealed archaeological features such as ancient pits and ditches cut into the natural geology, which were then carefully excavated by hand. Stripping the whole route showed that the extent and importance of the archaeology along the route was much greater than had been expected, and provided a unique opportunity to see how the history of the area had evolved over time.

Cropmarks appear when the crops are ripening. Crops grow taller, and ripen more slowly, over ancient filled-in ditches and pits where the soil is deeper, appearing as darker lines or areas in the yellowing crop from the air. Aerial photographs covering the new road route revealed a variety of archaeological features, including a very large ditch at the west end of the route.

Geophysical survey was carried out using a magnetometer, which measures magnetic variations in the ground. The soils filling buried pits and ditches often include charcoal, fired clay and topsoil, and so give a different magnetic signal, like the ditch continuing south-east on the line of the large ditch seen as a cropmark. On this site cropmarks and geophysical survey complemented one another, but neither gave the full picture of the archaeological features revealed during excavation (see plan to the right).

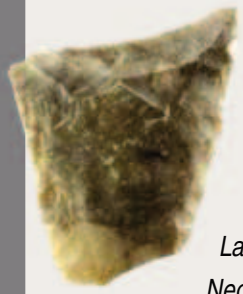
The field walking survey involved teams of archaeologists systematically walking across ploughed fields, collecting ancient objects brought to the surface by the plough. Finds included prehistoric flint tools and pieces of Roman and medieval pottery.



Dating methods

Mesolithic (8000-4000BC)

Early Neolithic (4000-3300BC)



Later Neolithic (3300-2400BC)

Early Bronze Age (2400-1500BC)

Arrowheads through time (those on the right are not from the A2)

The shape, decoration and method of manufacture of many objects such as flint arrowheads and pottery changed over time, so they can be dated. Changes may have been prompted by different prey, by new foods or drinks, or the way they were prepared and eaten. Coins are particularly useful as they generally carry an image of the ruler and can therefore be tied down to a fairly short period.

Scientific dating methods are also used. Radiocarbon dating is the best known and can be used on any organic material, including bones, wood or charcoal, plant matter, leather, textiles, and even charred food from cooking pots. All living things contain carbon, which comes in different forms, or isotopes. After the death of the animal or plant, one isotope changes into another at a known rate, so by measuring the ratio the time since death can be obtained. Cremations west of Tollgate Junction were dated to the Bronze Age using this method.

Sampling soil for OSL dating

Optically Stimulated Luminescence (OSL) works when fine silts that contain sand grains form in ditches and are buried by later fills. The sand grains are exposed to a laser beam, producing a 'luminescence' signal. The strength of this signal can be used to estimate when the sediment was last exposed to sunlight or in other words, the date when it was buried. This method proved that the enclosure east of Tollgate Junction dates to the Bronze Age (1700 - 1300 BC).

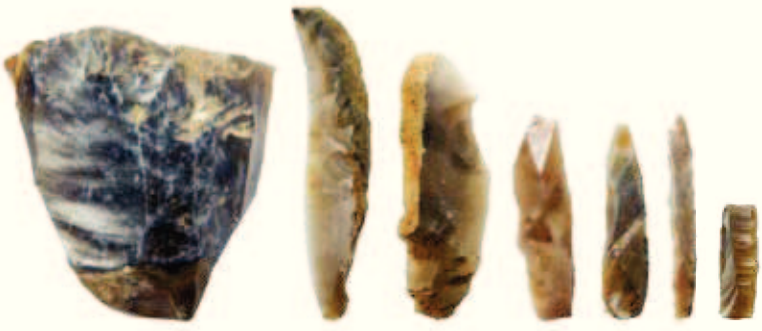
Coin of Commodus (AD 180-192)

Hunter-gatherers

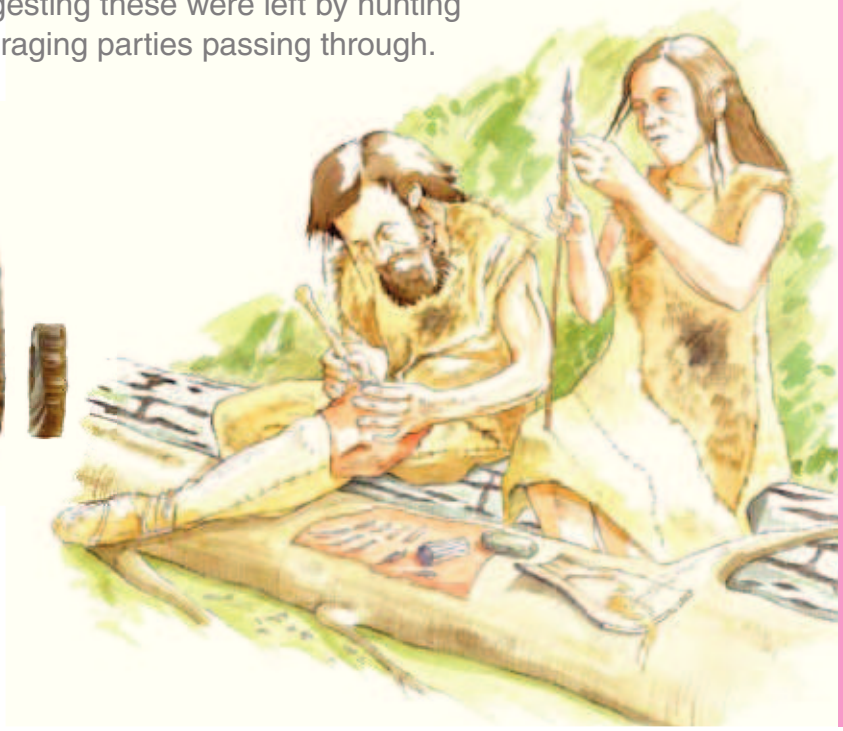
10,000–4000 BC

During the last Ice Age it was too cold for people to live in Britain. Once the climate warmed plants, animals and people began to return. The environment changed from tundra to coniferous forest and then to a mixed deciduous woodland (oak, hazel, elm, ash and lime). The people were hunter-gatherers, who did not cultivate crops or keep animals. The country was almost all woodland, except for small settlement clearings. These people did not build permanent homes but moved around a large territory following game and using whatever other resources nature offered: fish, berries, nuts and roots. Their belongings were few and portable, and almost all were made of organic materials like wood, leather and plants. These only occasionally survive in wet, waterlogged conditions, but on dry land they are unlikely to be preserved and only their flint tools survive. They made arrows, spears and harpoons of wood with multiple small flint barbs glued in, and it is these barbs that survive, along with straight-bladed cutting edges for butchery and axes for cutting wood for shelters and tools.

Large numbers of flints accumulate where a group lived for a season. On the A2 we only found a few flints, suggesting these were left by hunting or foraging parties passing through.



Mesolithic core, blades and microliths



The first farmers: Neolithic and Early Bronze Age 4000–1500 BC

From around 4000 BC, people began to grow cereals and herd livestock to supplement hunting and gathering, but still followed a semi-mobile way of life as the seasons changed. The first pottery and new kinds of ground stone tools were introduced.

Ground granite axe imported from Cornwall

Pits from a short-lived Neolithic settlement were found east of Tollgate Junction; one contained a flint leaf-shaped arrowhead dating from 4000-3300 BC. Another pit with flints dating after 3000 BC was found close by, showing repeated visits by local Neolithic people. The most impressive find was a ground granite axe head imported from Cornwall, which demonstrates the far-flung contacts of the first farmers. This axe had been rediscovered in the Iron Age and buried in a pit (see Iron Age Farming and Ritual).

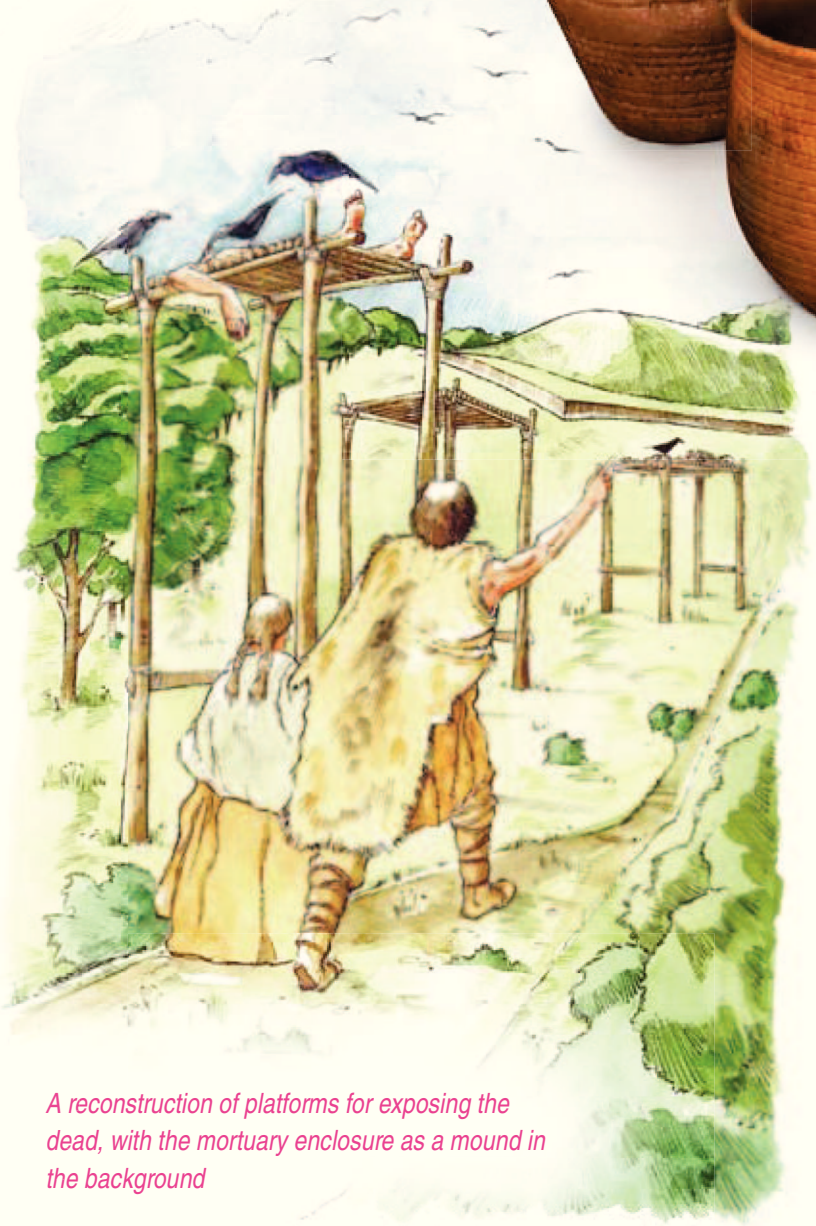
The first monuments were built during this period, such as communal tombs like Little Kits Coty near Maidstone. The new route of the A2 was designed to avoid a rectangular Neolithic enclosure which had been discovered during CTRL investigations. Other enclosures like this contained burials covered by a mound. Groups of postholes found close by may have been used to support platforms on which to expose the dead before burial.

Burial monuments became focal points for the scattered Neolithic families, where seasonal ceremonies for the birth of lambs or calves, planting and the harvest would be carried out, marriages made, deaths commemorated and goods bartered or exchanged.

A pit found west of Tollgate contained fragments from eleven different 'Beaker' pots dating from around 2200 BC, the Early Bronze Age. Enough survived of five of these to reconstruct a mix of fine decorated drinking cups and thicker food preparation vessels. This was close to a grave containing Beakers found during the CTRL excavations, and may indicate a contemporary

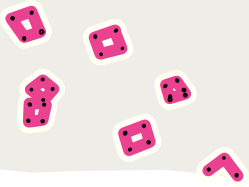
settlement and cemetery, or the burial of smashed pots (together with flint tools and the remains of food) during ceremonies held to commemorate the ancestors.

Reconstruction of a selection of the Beaker pots from a single pit



A reconstruction of platforms for exposing the dead, with the mortuary enclosure as a mound in the background

Four-post structures: platforms for exposing the dead ?



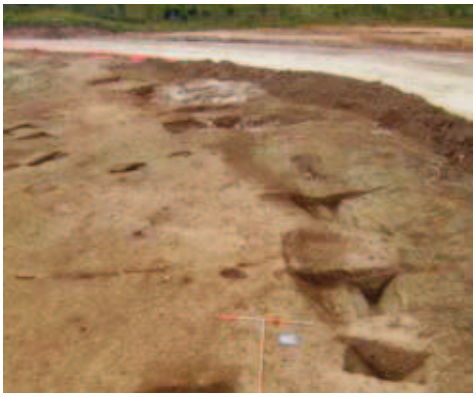
Neolithic mortuary enclosure ditch

Settling down:

the later Bronze Age

1500–800 BC

During the Bronze Age much of the woodland was cleared for grazing. From around 1500 BC, areas became divided up by fields and paddocks, or dotted with farmsteads and hamlets. People gradually abandoned mobile hunting and herding for a more settled way of life.

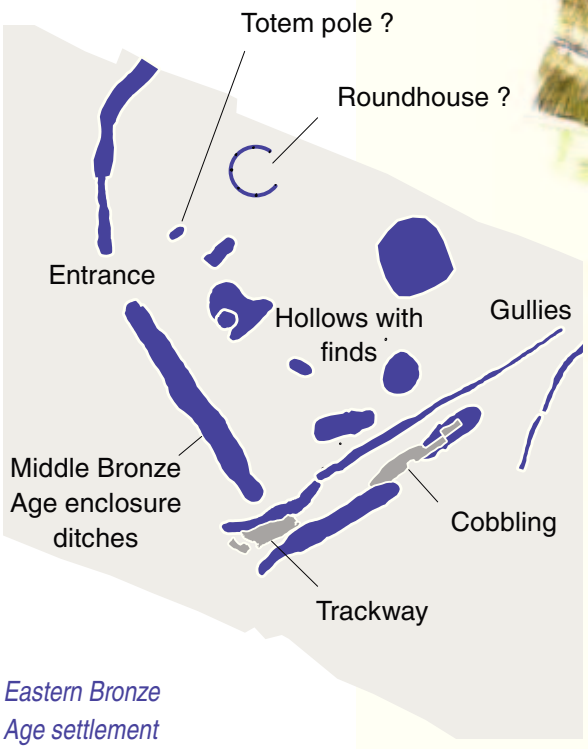


Enclosure ditch, looking south

Two small Middle Bronze Age settlement enclosures, probably farmsteads, were found occupying high ground either side of the valley at Tollgate Junction and about 1.5 km apart. Both settlements were surrounded by deep ditches on their south and west sides, perhaps dug for banks to provide shelter from the wind, and by shallower gullies to the east. A trackway paved with flint nodules passed alongside the eastern enclosure. Dating of the ditch sediments suggests that the enclosure was dug around 1500 BC.

Ramped posthole for 'totem pole', with bottom of charred post (half-dug)

Just within the entrance was the base of a very large charred timber post, possibly a 'totem pole'. The enclosure also contained a small oval house marked by a ring of posts, and a group of large shallow pits, probably outdoor working areas.

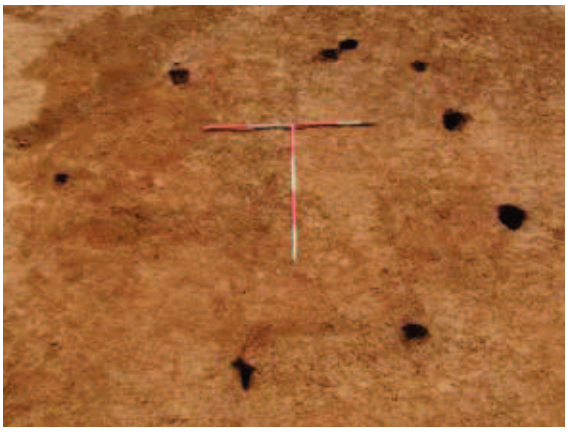


Eastern Bronze Age settlement

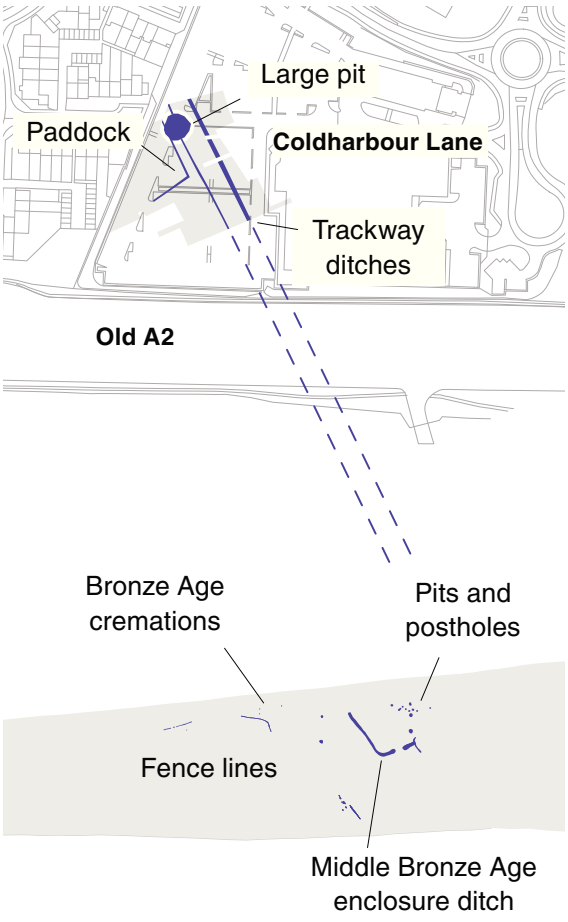
Reconstruction of the eastern settlement looking west

The western settlement enclosure was located 200 metres south of a Bronze Age trackway and paddocks found during separate investigations carried out at Coldharbour Road. A group of cremation burials was found alongside a fence outside the enclosure. Finds from the settlement included pottery, flint tools and bone awls for leather or textile working, and fired clay slabs from ovens.

At the western end of the route an isolated pit contained a large pot, which in turn contained a small pottery cup and cremated sheep and pig bone. Hazelnuts had also been burnt on the cremation pyre. Human cremations in pots are common, but animals without human bones are very unusual.



Postholes forming possible roundhouse from the eastern enclosure



Bone awls for leather-working

Western Bronze Age settlement

Farming and ritual: the Early and Middle Iron Age 800–100 BC

Arable agriculture expanded across southern England during the Iron Age. Clusters of deep circular Iron Age pits occurred all along the A2 route, and some had layers of charred grain at the bottom. Experiments have demonstrated that pits were an effective method for storing seed corn. There were also many small square buildings supported by four timber posts, like the granaries and temporary storehouses still used in eastern Europe until 50 years ago. Using raised storehouses helped keep grain dry and free from vermin. No dwelling houses were found, although these may have been built in a way that left few traces, or they could have lain outside the road corridor.

Triangular loom weights

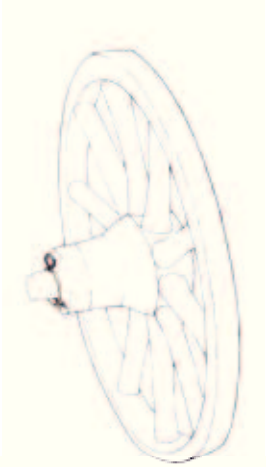
Saddle-shaped quernstone

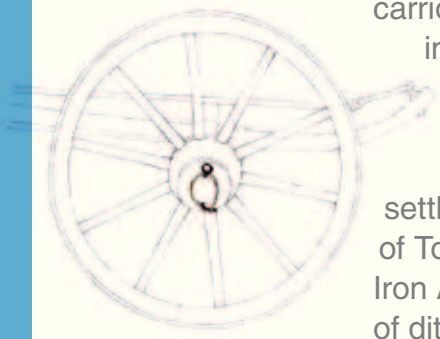
Many of the Iron Age storage pits contained whole objects interpreted as ritual 'offerings', placed within the pit once it had passed out of use. These may have been gifts to the gods, to give thanks for a good harvest, or to ask for a better one. These offerings included whole pots, querns and loomweights, layers of charred cereal grain, piglets and red deer antlers and skulls. Another offering was a Neolithic granite axe head which had been placed in a pit alongside an iron gouge. This must have been a strange and magical object to the Iron Age people who found it at least 2500 years after it was made. Human

Iron Age pit with smashed pots

Early Iron Age storage jar from the pit

Linch pin in use





bones were also found in some pits, but only one whole skeleton. During this period, it was a common practice to expose the dead to the elements and then retain some of their bones as relics or talismans. One of the pits containing human bone also contained a raven skeleton. These birds were regarded as special because of their role as carrion animals in the funeral process.

Linch pin, pot and chalk weight on pit base

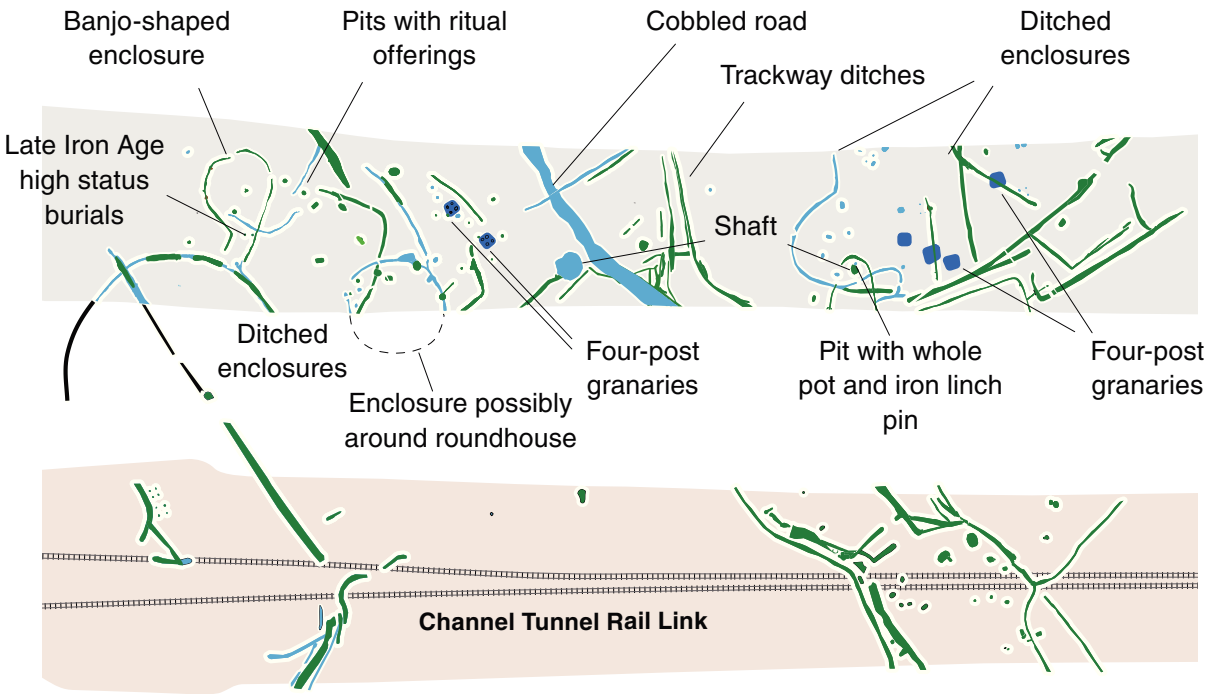
The dispersed Iron Age settlements came together at the west of Tollgate Junction during the Middle Iron Age (400 BC onwards). A series of ditched enclosures was constructed west of a cobbled road, with an open area containing pits and four-post structures to the east. Some of these enclosures were circular or curving, and may have surrounded roundhouses. The cobbled trackway was up to eight metres wide, and is a rare example of road construction before the Roman period.

Iron Age cobbled road

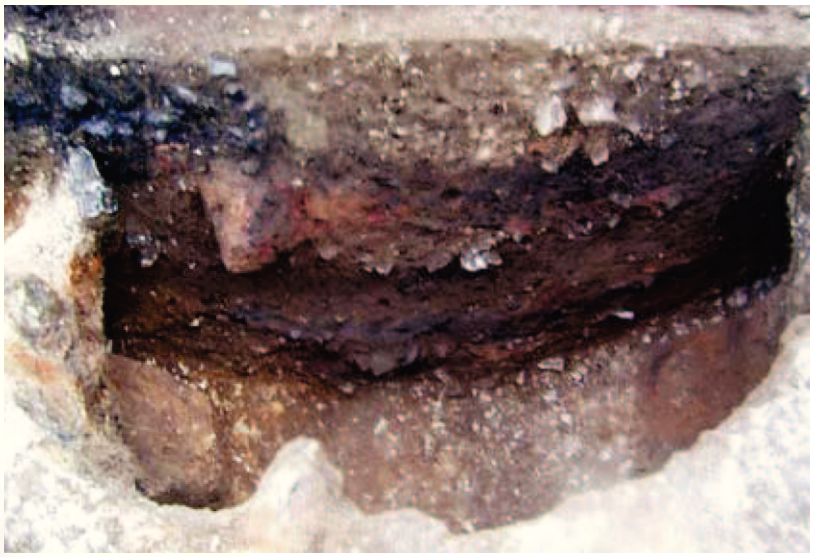
Abundant finds from the ditches and pits provide a detailed picture of everyday life in the Iron Age. The pottery included large, coarse jars used for storage and cooking, and more finely made bowls and cups used for serving food and drink. Triangular bricks of fired clay were used as weights for looms and thatch, and grain was ground into flour on large stone slabs known as saddle querns.

As the A2 is several kilometres from the Thames estuary, we were surprised to find evidence for salt production. Salt was important both for seasoning food and for preserving meat. Brine or wet salt 'sludge' was brought from the brackish tidal creeks of the Thames estuary to the north. This was poured into ceramic trays, which were propped on clay pedestals and heated on hearths to evaporate the water, leaving dry salt cakes. These were packed in rough clay vessels for transport to other sites. Large quantities of broken salt-making vessels were found along the route.

One of the most unusual finds was an iron linchpin from a cart or chariot, placed within a pit alongside a complete upside-down pot. This rare object would originally have secured the wheels of the vehicle to the axle. Made as a straight pin with a looped head, the other end was hammered into a curve once slotted through the axle, to ensure it could not come out.



Middle Iron Age settlement west of Tollgate Junction



Half-excavated pit showing layers of charred remains and fired clay

Salt-making pedestal

Potin coin

The first high-status burials:

the Late Iron Age

100 BC–AD 43

The Roman conquest of Gaul (modern France) brought traders and Mediterranean goods to Britain, and military expeditions led by Julius Caesar landed in Kent in 55 and 54 BC. Caesar wrote about Gaul and Britain; from him we learn the names of tribes and their chieftains, some of whom ruled land on both sides of the Channel. New customs and burial rites appeared, similar to those in northern France, and for the first time in Iron Age Britain rich burials appear.

The settlement west of Tollgate Junction continued to thrive, with ditched enclosures on both sides of the cobbled road. Pits for grain storage and rituals continued to be dug throughout this period. One shaft was over 4 m deep; this could have been a well, or perhaps a deeper version of the pits used for making offerings to the gods. Along the edge of the dry valley at Downs Road a large deep boundary ditch was dug, and smaller ditches running down the valley slope from it probably marked fields belonging to the late Iron Age settlement.

Wheel-thrown pottery now appears alongside hand-made vessels, and the range of types grows, perhaps reflecting more variety in the diet. So-called ‘safety-pin’ brooches also become much more common, indicating a change in clothing.

Six coins made of tin-rich bronze (known as potin) came from pits in the main settlement. Coins of this kind are

Triangular and rectangular chalk weights

the earliest made in Britain, dating from 150–0 BC. The coins were moulded in strips, and so have straight edges on the sides where they were snapped off. They are marked with stylised designs imitating coins made on the Continent. It is still hotly debated whether these coins were used like money today, or (as they were not very common) for special purposes such as marriage payments (dowries), or as religious offerings. As they were found with whole pots and other whole objects, it is unlikely that those along the A2 were chance losses.

One pit contained a pair of chalk weights, which appear to be unique to this site in Iron Age Kent. These weights may have come from a loom for weaving cloth, or perhaps helped weigh down thatch on a roof. Three unfinished examples came from other pits.

A pair of cremation burials with rich offerings was discovered in an enclosure west of the road. One of the burials included two pottery jars and two cups, six brooches, four of bronze or brass, two of which were joined by

a finely-made chain, and two others of iron. These were in a wooden container. In the second burial, the ashes were contained in a bucket made of staves of yew wood bound with highly polished and decorated bronze strips. There were also two pottery jars and a polished bronze cylinder, possibly part of a metal and antler cup. Decorated buckets have been found in other high-status Late Iron Age graves in Kent, sometimes with bronze jugs or ladles; these were probably used to hold beer or other alcoholic drinks. Together the bucket and cup may represent a British drinking set.

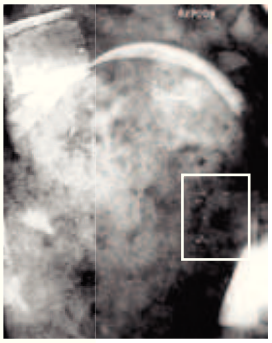
These graves show that the settlement west of Tollgate Junction included a family of wealth and influence, possibly linked to the temple complex founded during the Late Iron Age at Springhead, the head of the River Ebbsfleet, 2 km to the north-west.

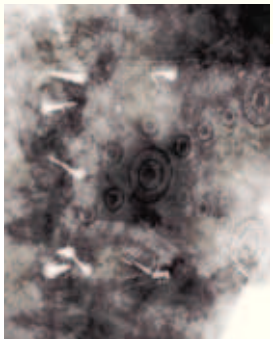
X-ray of brooches and chain

Reconstruction of pots from the grave with brooches

Reconstruction of the bucket (upper part conjectured)

Below: X-ray of cup and bucket and detail of decorated bronze plate





Environmental evidence

Archaeological excavation is not just about finds and buildings. Recovering plant and animal remains is also very important.

Animal bones provide evidence for the wild animals hunted for food or skins (red and roe deer and wild cat in the Iron Age) and for the livestock kept by farming communities (cattle, sheep and pigs). The sex of the animals, and their age when killed, reflects whether the animals were kept for meat or for milk. Wild animals can also tell us about the environment; wild cats, for instance, live in woods. Seeds, fruit pips and nuts survive less often, but grain, peas and beans were all charred in the medieval ovens. To retrieve these, bucket-sized soil samples are dissolved in water so that plant remains float to the surface and can be captured in a fine mesh. Charred plum stones indicate gathering in the Bronze Age, as do hazelnuts in the Iron Age.

Together, study of animal bones and plant remains can provide a detailed picture of diet and what cultural taboos existed. For example, Iron Age communities in Britain generally avoided fish or shellfish, but along the A2 cod and herring bones and some mussel shells were found in Iron Age pits, showing that local people were fishing and collecting shellfish from the Thames estuary.

Charcoal and charred weed seeds provide evidence of trees and plants around the site. Different species of snails favour different conditions, such as marshland, open pasture, or woodland, so the proportions of these found in the soil samples tell us what the local environment was like. This technique shows that the Bronze Age enclosures were created in grazed grassland, and that a hedge then grew alongside the ditches.

Woodland snails

Disturbed ground snail

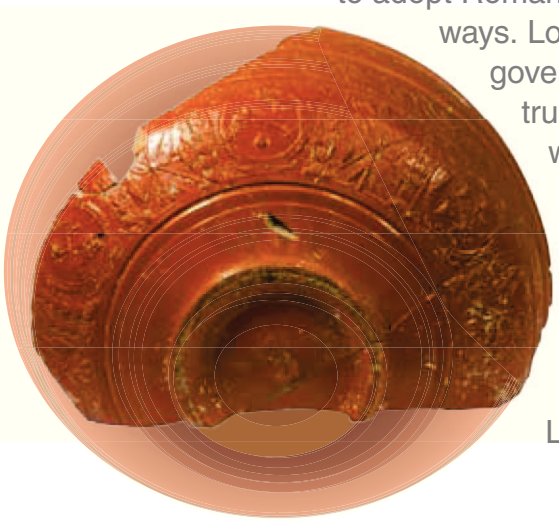
Grazed grassland snail

New overlords:

the Early Roman period

AD 43–250

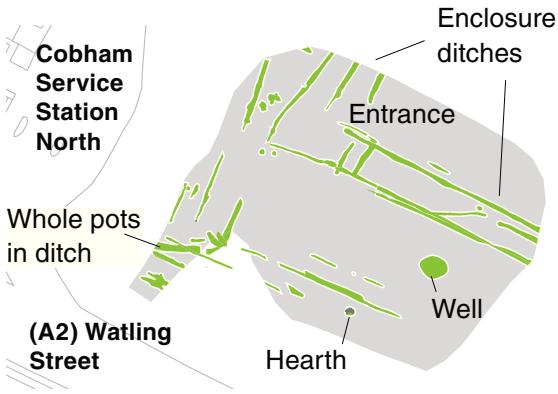
In AD 43, the Roman army landed in Kent to conquer Britain. The conquest brought Britain into a vast empire stretching as far as North Africa and the Middle East. Roads were built and towns founded. People had greater access to manufactured goods and imports from overseas. While many people would have resented the conquest, at least at first, others were keen to adopt Roman ways. Local government was run by trusted native aristocrats who embraced the imperial system and came to think of themselves as Roman.



Samian bowl decorated with animal scenes from the Tollgate enclosure

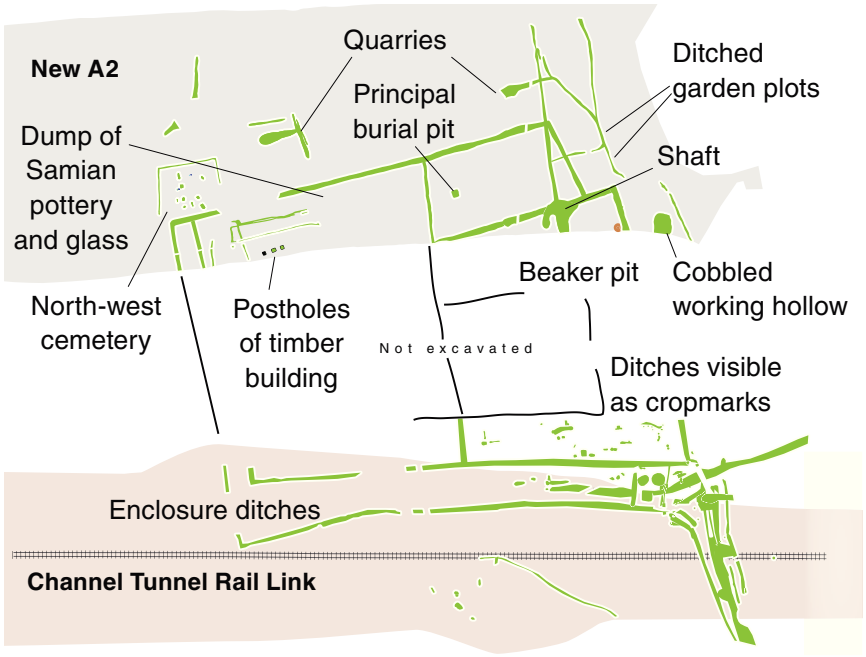
A new main road was constructed from London to the channel ports at Dover and Richborough. The Anglo-Saxons later named it Watling Street, and later still it became the A2. The road passed through the religious centre at Springhead, which developed a cluster of temples with a market, and extensive cemeteries on its outskirts.

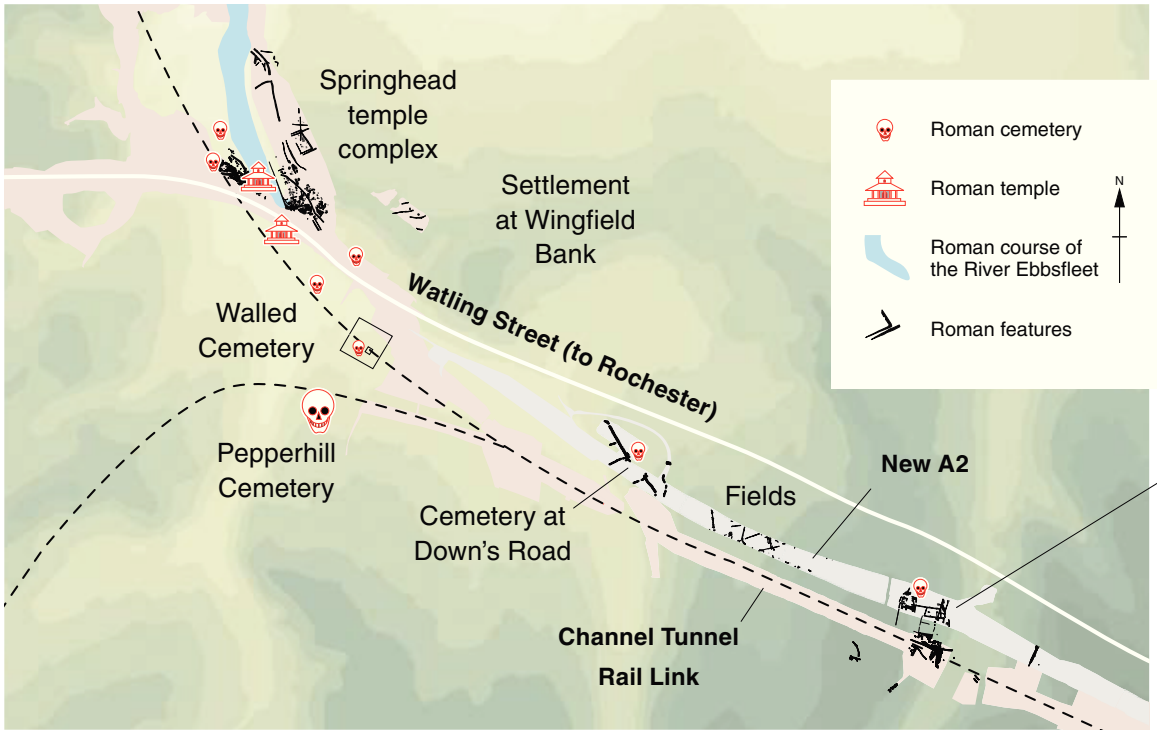
Around the time of the conquest, the Iron Age settlement shifted east to a new group of rectangular ditched enclosures overlooking Watling Street at Tollgate Junction. The abandoned settlement became fields. Only the northern part of the new settlement lay within the road corridor. The southern edge of the settlement was excavated during the CTRL work, but the central section has not been investigated. A further settlement was also founded around this time 3 km further east at Cobham Services.



Postholes from a large timber building were found within the Tollgate enclosure at the very edge of the investigations, indicating that the buildings lay in the unexcavated area to the south. The pottery included

vessels with a glossy red finish, known as Samian ware, that was imported from France. The large numbers of fine vessels with elaborate moulded decoration at the Tollgate enclosure are unusual, suggesting that wealthy, high-status people lived here. Other finds from the settlement included part of a glass vessel. So, did the high-status family that lived in the Late Iron Age settlement maintain a position of power and influence after the Roman conquest? This was confirmed in a spectacular fashion by the discovery of the first high-status Roman burial.





Early Roman settlements and cemeteries around Springhead

The high-status Roman burials

Within the north-eastern part of the Tollgate enclosure was a large pit about 2 m square. When one half of the pit was excavated little was found, until a pair of brass handles with degraded wood attached was uncovered at the very bottom. Twenty-two glass counters – 10 white and 12 blue – were found nearby, along with two dice made from antler, the remains of a gaming set. This is one of only 20 or so Roman gaming sets found in Britain.

Gaming board handles, counters and dice (on modern board)

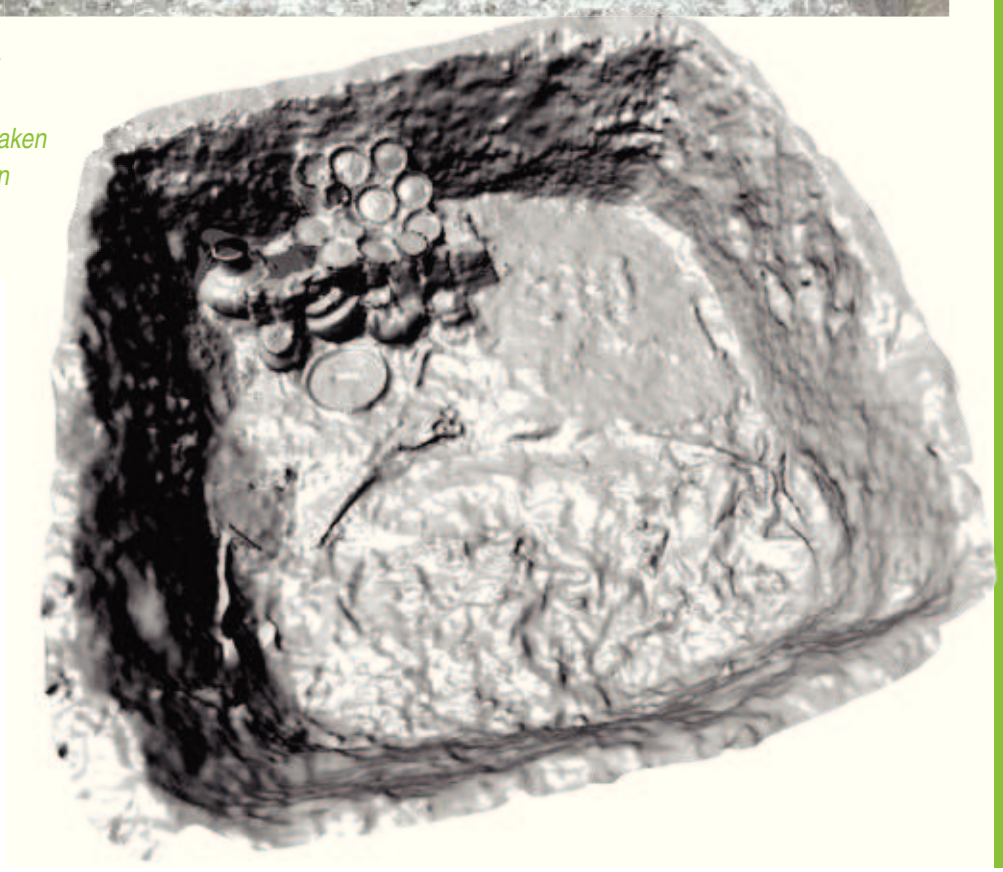
As other gaming sets had been found in rich burials, it was with great excitement that the second half of the pit was excavated. Cremated human remains were found at the base of the pit, accompanied by a spectacular array of objects. The cremated ashes themselves were found in the south-west corner of the grave, next to a large and highly-decorated brooch. The brooch may have fastened a bag containing the ashes.

Thirteen pottery vessels, mostly fine cups and dishes imported from France, were found close together in a square halfway up the grave fill. Just below were horizontal lines of decorated bronze strips and tacks, and it seems that the pots had been placed standing on a wooden table, which had decayed leaving only its decorative metal fittings (see section on Conservation of the graves for more details). The pots could have contained food, though if so all traces had gone. On the bottom of the grave around the table were four more pots – two large wine flagons, a beaker for drinking beer, and a large platter.

Provisional reconstruction of grave and offerings

Highly decorated bronze brooch, probably imported

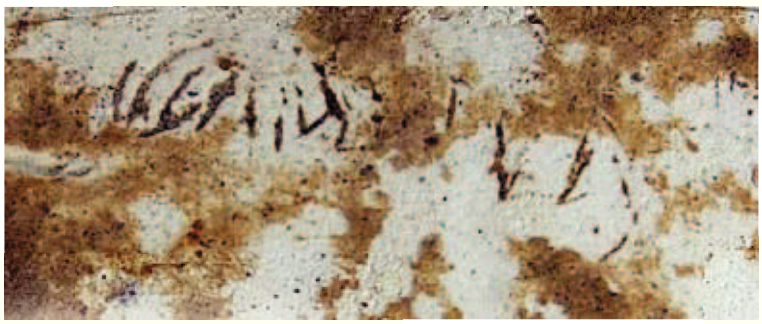
Above: the burial pit under excavation
Below: Laser scan taken for 3D reconstruction



Two-handled flagon, with painted lettering

Some of the pots were stamped on the base with the maker's name. One of these potters, Benio (sometimes Binio), was working in the Marne valley in France before the conquest of Britain. The local clays used for his stamped pots in the grave show that he had established a workshop in North Kent near Upchurch by AD 50; similar platters suggest a batch made specially for the burial. Benio was one of the founders of the Upchurch pottery industry that supplied Kent through most of the Roman period.

One of the flagons had letters painted on, perhaps to identify the contents, and another had scrawled graffiti. The flagons were locally made, so this is important evidence for the ability to read and write very soon after the Romans came.



Graffiti - perhaps a signature ?

Three-footed wine mixing bowl

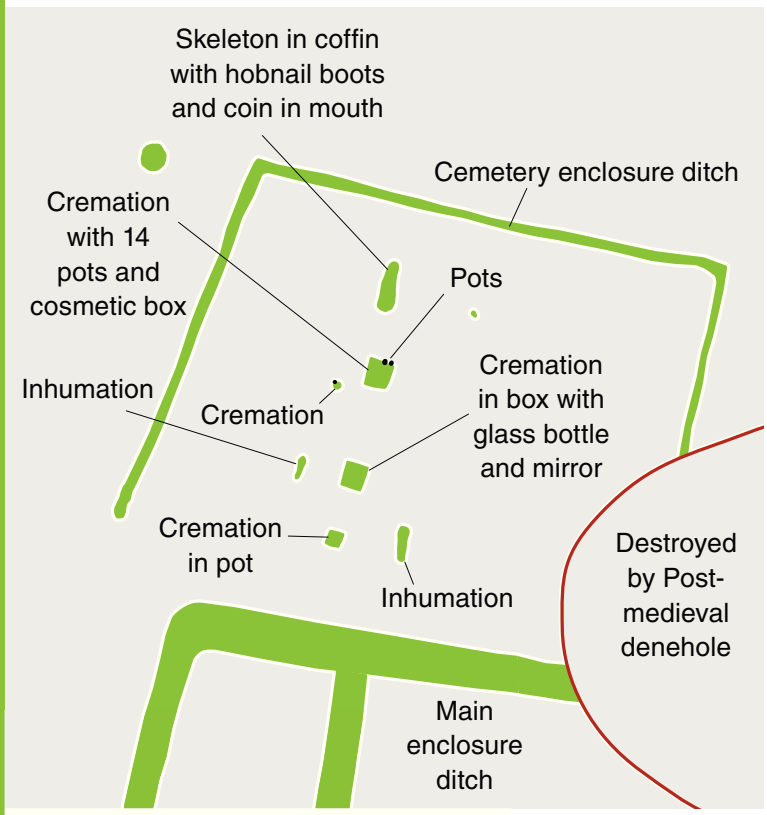
Three bronze vessels were also found near the table: a large wine mixing bowl, a jug (ewer) and a pan (patera). The mixing-bowl was decorated with vine leaves and a line of eyes, and a small pottery beaker was found inside. They were probably used for preparing and serving food or drink at feasts. The jug handle had a woman's head at the top, and a larger head at the base, while the handle of the pan was decorated with a ram's head. Similar jug and pan sets are often depicted on Roman coins and altars, and were used for ritual washing at funerals, and for pouring offerings to the gods. All three of the bronze vessels were imports from Italy, and are very similar to examples found at Pompeii.

Placed between the bronze vessels and the gaming set were the head and forelegs of a pig. Iron Age graves sometimes contain a pig or sheep, perhaps food for the next life, but the Romans also sacrificed pigs to Ceres, goddess of the underworld, at burial. The finds from the grave show that it dates to the first generation after the Roman conquest, c. AD 43–70.

Top of handle in the form of a woman's head

Female head at the bottom of the jug handle

Bronze jug (the handle was made separately and soldered on, but has come apart)



This burial stood alone within the main enclosure. Seven more burials were found in a smaller enclosure at the north-western edge of the settlement. Two of these were also high-status cremations in square pits, again dating to just after the conquest. One had a similar bronze jug and pan set, and also a folding board with bronze hinges, although this time there were no counters. There were fourteen pots, again including fine dishes, cups and beakers, and two wine flagons. There was no wine-mixer, but instead a decorated Samian bowl may have served the same purpose.

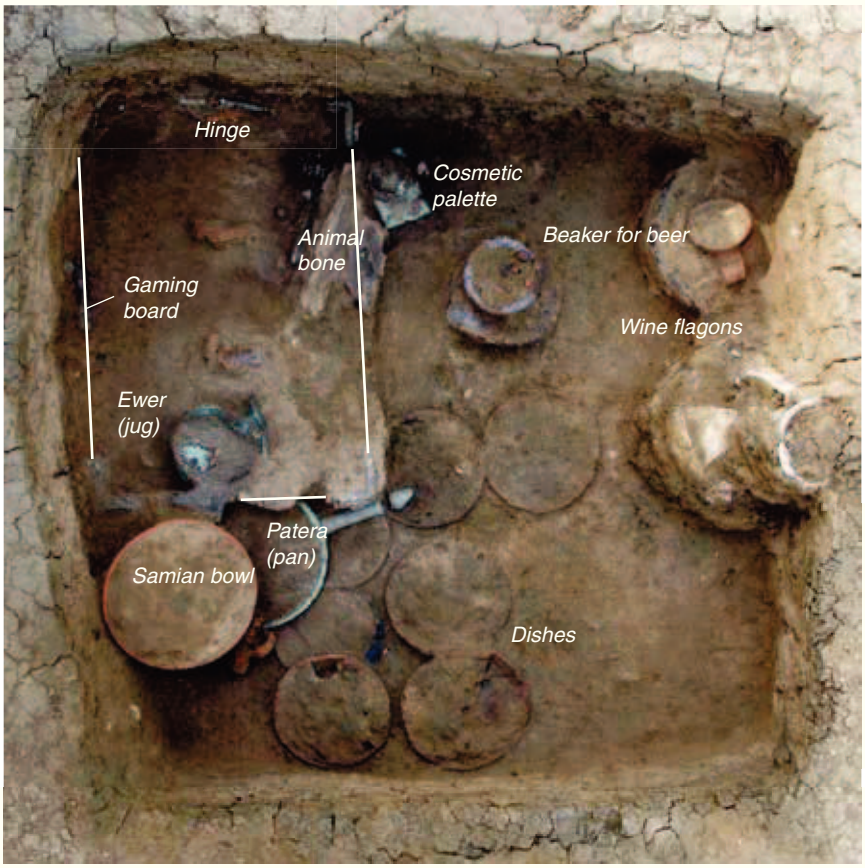
A further remarkable find was a bronze-bound box containing a small bronze spatula. A bronze-sheathed stone palette lay next to the box, and together these objects could have formed a set for mixing cosmetics. Similar boxes from the Continent contained medicine pills and jewellery. Pig bones show that pork joints were also placed in the grave. Again, the cremated ashes were found with a brooch that may have fastened an enclosing bag.

Small beaker found inside the wine mixing bowl in the first grave

Detail of woman's head at base of handle

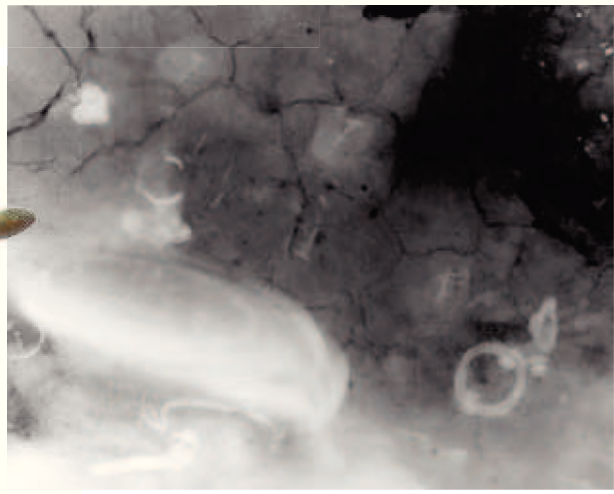
Jug from the second grave (left)

Detail of ram's head from the pan handle



The other high-status burial contained the ashes of a woman. Nails and bronze fittings indicate that the cremation lay within a wooden box the full width of the grave. Two pottery plates stood on edge along the line of the nails, suggesting they had been leant up against the edge of the box. Other offerings included a square bronze mirror with a patterned leather backing, a wooden casket held together by lines of bronze tacks and decorated with bronze drop handles and rings, a glass perfume bottle and a pottery beaker, a cup and another plate.

Below left: Cosmetic limestone palette with bronze spatula



Samian bowl with unique geranium decoration

The three people buried in these high-status graves were likely to be pro-Roman aristocrats. Either they were wealthy enough to buy these exotic imports, or they received them as gifts, the rewards of loyalty.

They had adopted a Roman lifestyle, central to which were new ways of dining, including the use of elaborate table sets, and drinking wine. Feasts would be provided for important guests, when board games might be played. Aristocratic appearances were maintained through personal presentation and hygiene (shown by the cosmetic set and perfume bottle), and by the Roman furniture (the ornamented table and casket).

X-ray from the second burial in the north-west cemetery, showing a plate on edge surrounded by rings, a handle and bronze tacks

Recording and conserving the high-status burials

Right: Detail of decorative tacks in soil block

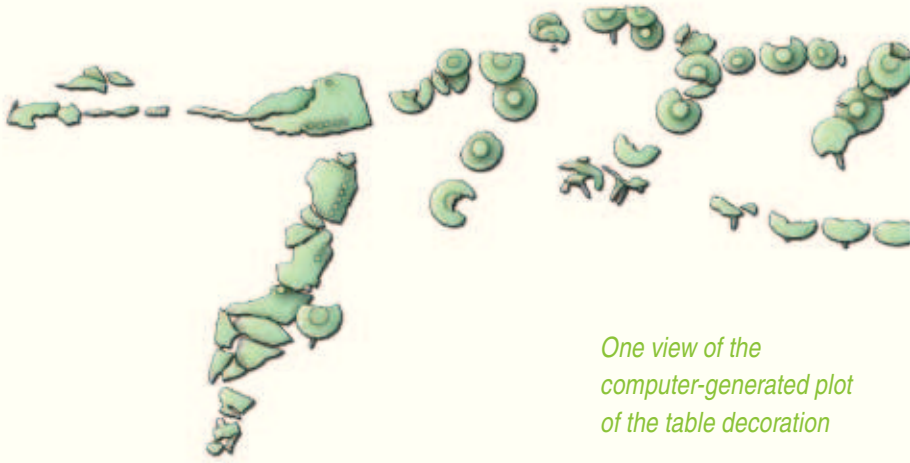
Below: Recording the positions of the tacks in 3D with the arm

A 3-D record was made of the objects in the largest grave while still in the ground by laser scanning. This can be used to create a digital reconstruction of the grave later.

In order to protect the fragile and valuable objects found in the graves, a conservator became a full-time part of the excavation team. Metal objects were coated with a special wax to prevent them decaying on exposure to the air, and complex objects were lifted in soil blocks for excavation off site in the laboratory.

The blocks were x-rayed to reveal the objects contained within them, before they were carefully excavated.

A special arm connected to a computer was used to create a detailed 3D record of the position of the objects within each block. This method was particularly useful for recording the bronze tacks and strips of the table from the first grave, providing valuable information on how this piece of furniture might have looked.

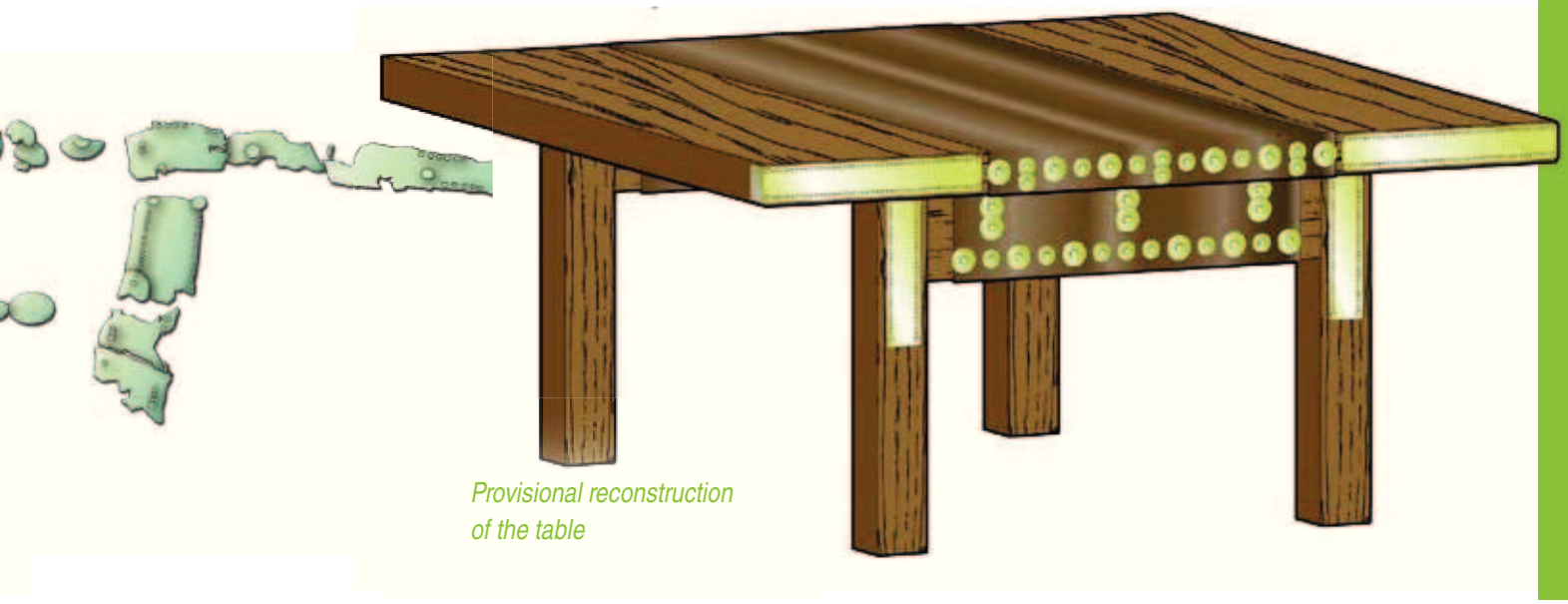


One view of the computer-generated plot of the table decoration

Protecting the tacks with wax before lifting

Coating the pots with plaster before lifting

Wrapping the Samian bowl before lifting



Provisional reconstruction of the table

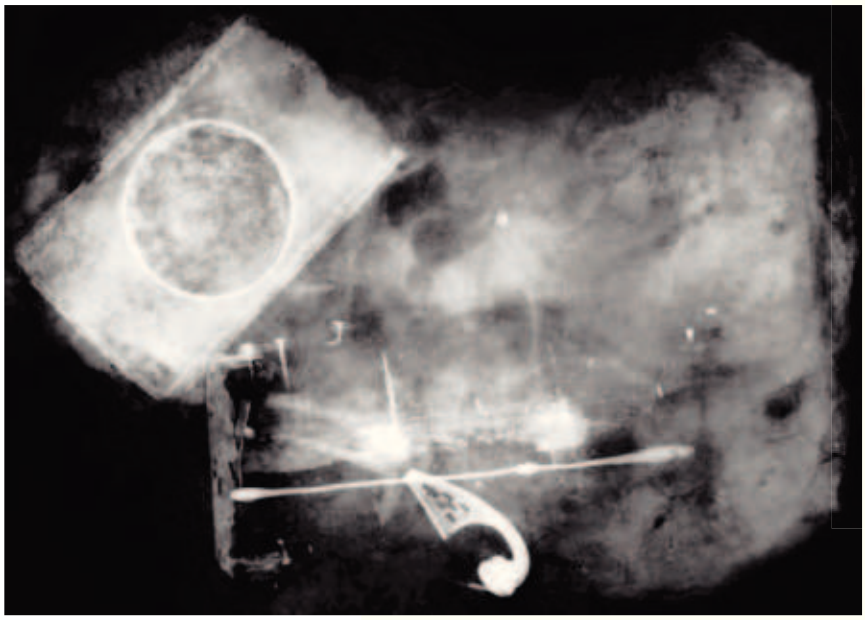
Detail of straw impressions under the ram's head

Most organic materials such as wood, leather and cloth decay soon after burial, but contact with metal objects sometimes preserves them. The decorated plates on the Iron Age bucket had yew wood preserved behind them, and the wood preserved in the handles of the Roman gaming board was sweet chestnut. More often the impressions of wood grain, straw or textiles are preserved in the corrosion that builds up on the metal surfaces and can be identified under the microscope; this has shown that the wine-mixing bowl and the adjacent pan sat on straw, and that the bowl was covered by a woven cloth.

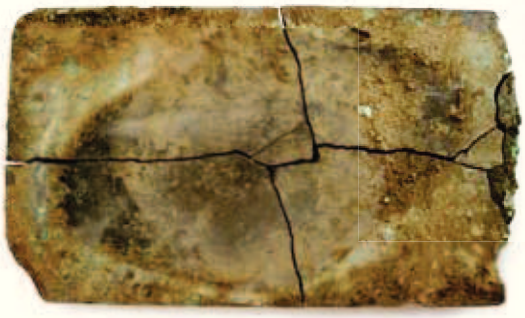
Pan from the first grave.

Painstaking work will now be needed to conserve the objects from the graves, ensuring their long-term preservation for future study and display.

Top of mixing bowl and detail of textile impressions on the handle

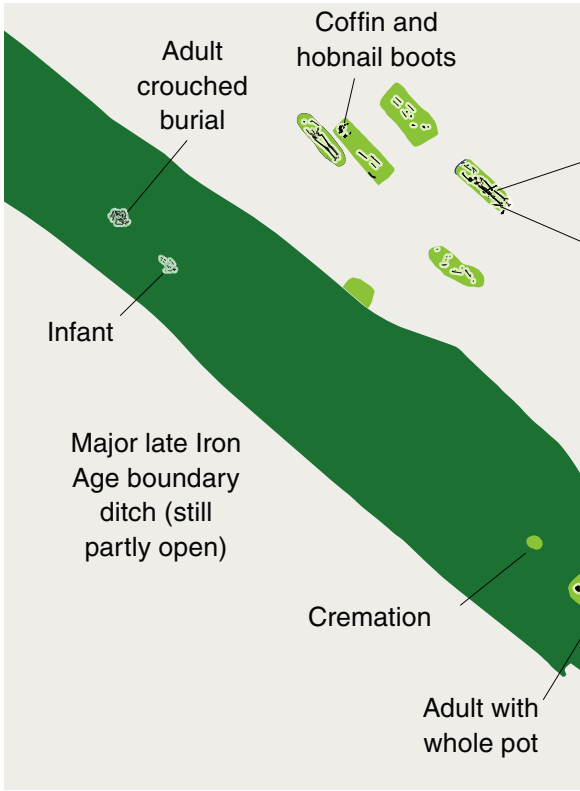


X-ray of brooch, compartmentalised box, spatula, cosmetic palette and its metal sheath with the excavated objects



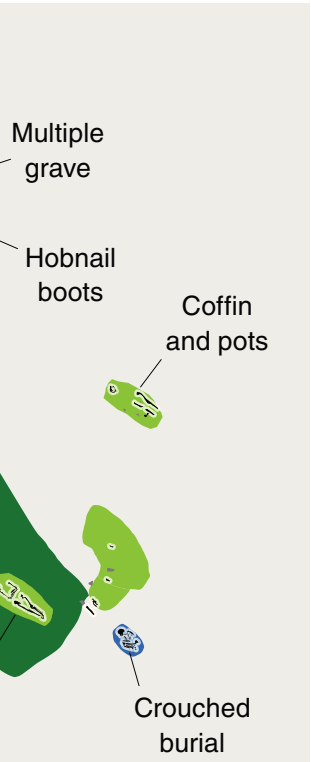
Later Roman burials

Five much simpler graves also came from the north-western cemetery. Two of these contained cremations. These ranged in date from AD 70-100 to AD 250-275, later than the high-status cremations. Most of these burials contained only a few pots, or no grave goods at all. The exception was the latest burial, which had been placed in a wooden coffin identified from the surviving iron nails. Three pots had been placed at the waist and a pair of finely-patterned hobnailed shoes upside-down at the feet. A coin of AD 260–296 was found in the mouth, as payment for the ferryman who was thought to carry the souls of the dead across the River Styx to the afterworld. These later burials suggest either that the wealthy family living west of Tollgate had declined in fortunes, or buried their dead elsewhere.



Early Roman pot from the grave in the end of the ditch

Finely patterned hobnailed shoes and coffin nails

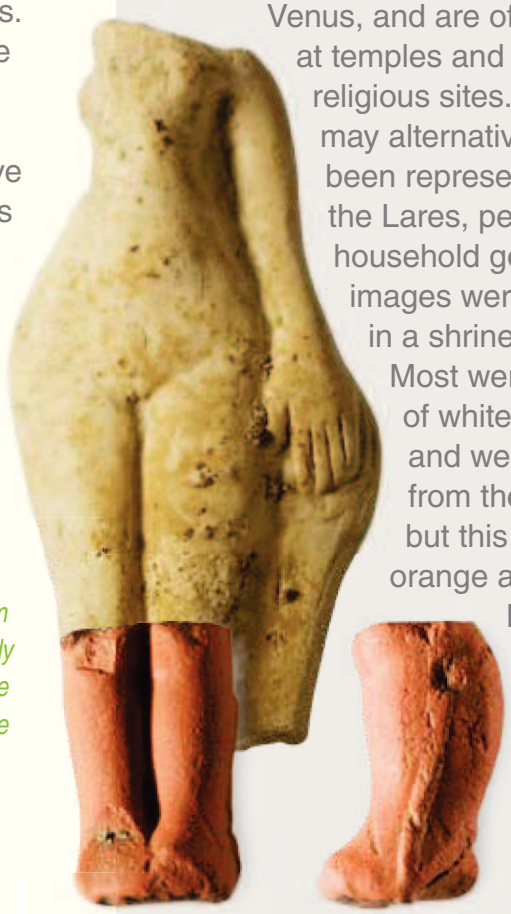


A second Roman cemetery was found to the west, near to Downs Road, within and alongside the boundary ditch dug in the Iron Age. The burials date from AD 100-400, and included adult men and women, children and infants. Only one person was cremated; some others had iron coffin nails. One grave contained two men and an infant, perhaps successive generations. The burials from this cemetery had few grave goods: hobnails from shoes came from a few, two graves contained pots, and one a decorated harness ring. The cemetery was probably used by local farm-workers.

Crouched Iron Age burial, perhaps buried at the end when the boundary ditch was dug

A Roman goddess?

An interesting object found between the Tollgate settlement and the Downs Road cemetery is the lower part (legs and feet) of a pottery figurine. Roman figurines like this usually represented the goddess Venus, and are often found at temples and other religious sites. They may alternatively have been representations of the Lares, personal or household gods, whose images were often kept in a shrine at home. Most were made of white-fired clay and were imported from the continent, but this example is orange and may have been locally made.



Pottery feet from the A2. The body is from a figurine from Oxfordshire

Settlement shift: *the Late Roman period AD 250–410*

The Tollgate settlement and cemetery seems to have been abandoned during the later third century AD, around 130 years before the end of Roman rule in Britain. No evidence for late Roman settlement was found elsewhere along the route. The third century AD seems to have been a time of disruption elsewhere in west Kent, with many farms and villages going into decline or being abandoned, along with the town of Springhead.

In contrast, large villas at Cobham to the east and Northfleet to the north flourished in the late Roman period. These luxurious dwellings with their large barns were probably the centres of agricultural estates; recent excavation at Northfleet has shown that agricultural production increased dramatically in the third century. Just west of Downs Road on the CTRL, a large Roman corndrier was built for the large-scale processing of grain in the Late Roman period.

A chain of large stone forts was built around the coast at this time, part of a reorganisation of defence backed by highly mobile rapid-response units. Whether this was a response to the start of Saxon raiding from Germany, or internal fighting between would-be Roman emperors (Britain had its own emperor for part of this time), the abandonment of the Tollgate settlement was probably linked to a reorganisation of the local landscape and economy to centralise population in more defensible groups and supply the forts and the military.

Late Roman 'crossbow' brooch from the Tollgate enclosure

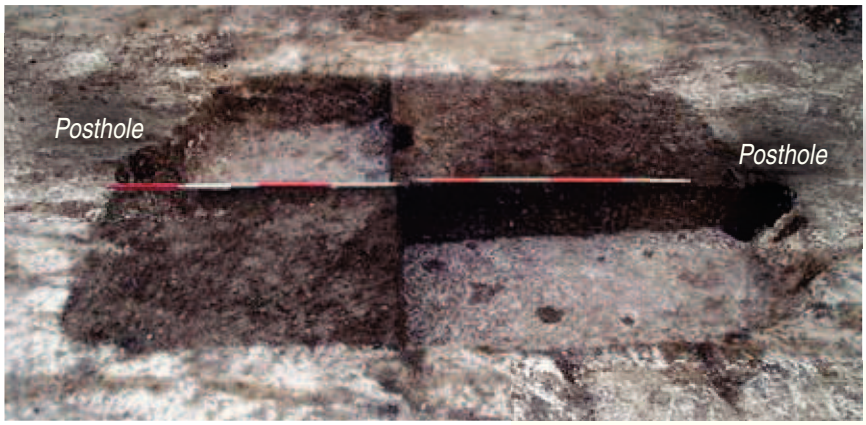
An Anglo-Saxon building

AD 410–700

In the fifth century AD Roman rule collapsed and new settlers arrived in Kent. Written sources record migrations of Angles and Saxons from Germany and Jutes from Denmark. New buildings, styles of dress and jewellery, and a return to handmade pottery show these links to northern Europe.

A lone Anglo-Saxon building was found close to Downs Road. The rectangular floor area was dug out half a metre below ground, and the roof was supported on a large post in the middle of either end. Pottery from the building dates to the 5th to 7th centuries AD.

Sometimes sunken floors were worn by trampling, so are interpreted as part-underground workshops for crafts such as weaving, with low walls and sloping roofs (see reconstruction). There was little wear on the floor of the A2 example, and it has also been suggested that the area below ground was ventilation for a suspended wooden floor at ground level, creating a dry environment for storage. On the A2, ploughing has destroyed the surrounding ground surface and, with what evidence we have, either is possible.

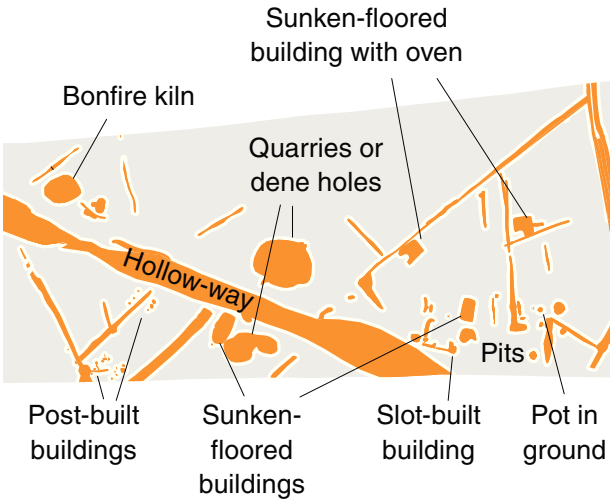


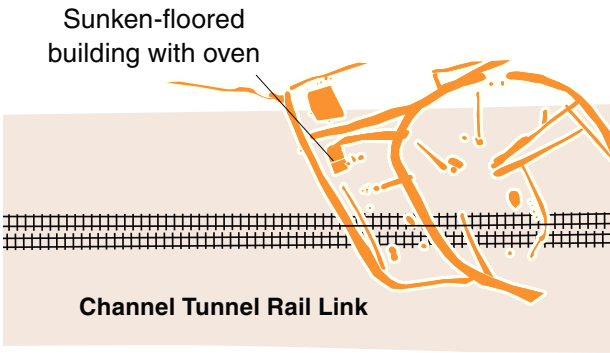
Half-excavated Saxon building. Note the posthole on the right

Silver 'longcross' penny of King Edward I

Medieval rural life AD 1000–1400

Three medieval settlements were found along the road corridor. At the western end part of a settlement dating to AD 1050-1200 was uncovered alongside Downs Road, next to a timber hall found on the line of the CTRL. About 700 metres to the east, near Tollgate Junction, a series of ditched plots containing buildings was laid out either side of a sunken track or 'hollow way'. This hamlet, which began in c. AD 1100 and lasted to c. AD 1300, also extended into the line of the CTRL. A series of paddocks, a building, pits and a pond dating from AD 1050-1250 was found alongside Watling Street further east at Cobham Services.





All three settlements contained unusual buildings with sunken floors. Although common in Saxon times, only a few medieval buildings of this kind have previously been found, almost all in Kent. Some contain a large and a smaller hearth or oven side by side, and have been interpreted as bakeries, the smaller oven for warming the dough, the larger for baking the bread. But in the Tollgate hamlet, at least five of these buildings were found, some without ovens. It is more likely that some were kitchens (which because of the risk of fire were usually separate buildings) and others workshops. In the hamlet buildings constructed with posts, and others with narrow slots forming a rectangle, probably held the timbers of larger rectangular houses.

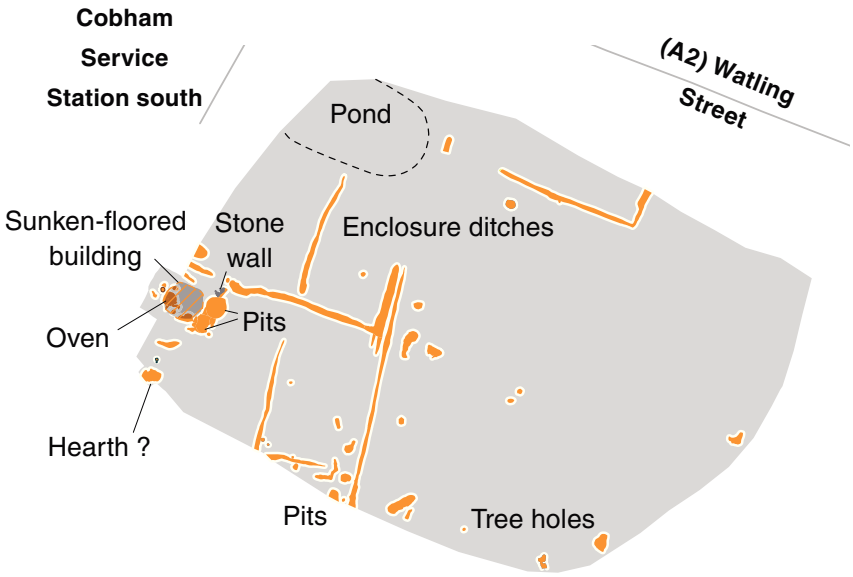
Selected pottery from the Medieval settlements

Enclo-
sure
ditch

The people in these settlements were mainly involved in farming. They grew cereals, peas and beans and raised cattle, sheep, pigs and chickens (chicken bones and eggshells were found). Oyster, mussel and cockle shells came from the Thames estuary, and cod and herring bones from Kentish fishing ports. The pottery was a mixture of local wares and imports such as Thetford Ware from East Anglia.

Oven from a sunken-floored building

Reconstruction of a sunken-floored bakery

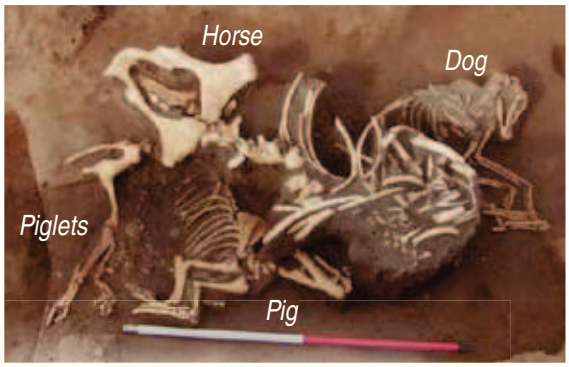


South of Singlewell the skeletons of a pregnant sow, a dog and a horse were found together in a pit dated to the fifteenth century. It is unusual to find animals of different species together, and as the horse had been butchered, the pit was probably not dug to bury diseased animals. Perhaps this is an example of medieval pagan superstition, or even witchcraft.

Detail from the medieval Life of Alexander, showing a grindstone in use (courtesy of the Bodleian Library, University of Oxford, MS Bodl.264 fol 113V)

An unusual circular stone, probably made from imported French limestone, had holes on either side suggesting it may have been a mechanically-driven quern or a grindstone for sharpening tools. There were also small whetstones made from the local Kentish Ragstone. There is little indication that the people were wealthy; only a single coin was found, a silver penny of Edward I (1272–1307).

Grindstone showing holes for attaching turning arm



Multiple animal burial south of Singlewell

As this historic map shows, none of these medieval settlements survived into post-medieval times; all were abandoned before or during the 14th century AD. What caused this settlement shift is still uncertain; the early 14th century was a time of crisis in England, with crop failures and famine between 1315 and 1325, but there may have been other local factors that led people to move their homes.

Extract from Hasted's 1896 map of the Hundred of Shamel and Totlingtrough (Courtesy of Kent Archive Service, Centre for Kentish Studies)

The recent landscape

AD 1400–2000

In recent centuries, the land crossed by the road corridor has mainly been used as farmland. A series of shafts 3-5 m deep found along the route are 'deneholes' or 'chalk wells', almost exclusive to north Kent and south Essex, and once an important part of the local rural economy. Some have vertical shafts and bell out into a larger chamber at the bottom; others have ramps or sloping tunnels leading down to a vertical shaft.

Denehole exposed west of Tollgate with a sloping tunnel leading down to the start of a vertical shaft

Deneholes were dug during the Middle Ages up until the early 19th century, but by the late 19th century their purpose had mostly been forgotten. They were mostly dug for chalk to spread on arable fields as fertiliser. The chalk could also be used as building stone, or burnt to produce lime for mortar. As labour was cheap, and good farmland was at a premium, it made sense to dig a narrow shaft rather than an open-cast quarry. Farmers also believed that chalk quarried from underground seams made better fertiliser than chalk gathered from the surface.

During the Second World War an anti-aircraft battery and army camp was built at Northumberland Bottom, just south of the new road near Tollgate Junction. We know that the camp was targeted by air raids, as a scatter of German incendiary bombs was found during the excavation just north of the camp.

Superimposed fragments of incendiary bombs beside an intact example

Finding out more

The final results of the archaeological work on the A2 will be published in an academic monograph. For more about other finds in the area, see Tracks and Traces. The archaeology of the Channel Tunnel Rail Link, Oxford Wessex Archaeology. The Archaeology of Kent to AD 800 edited by John H. Williams (Kent County Council).

Acknowledgements

Tim Allen and Lucy Martin of Oxford Archaeology project-managed and designed this publication for Skanska on behalf of the Highways Agency. Trevor Sharpe, Project Director, and Gary Rogerson, Environmental Manager, commented on the images and edited the text; Phil Cheesmur, the Highways Agency Project Manager, reviewed the publication.

The archaeological fieldwork was carried out by Oxford Archaeology. The dedication and professionalism of all the archaeologists who worked as part of the site teams is gratefully acknowledged. Specific thanks are extended to Director Bob Williams, to Project Manager Tim Allen, assisted by Ros O'Maolduin, and to Mike Donnelly and Guy Cockin for running the fieldwork on site.

We would like to thank Skanska for facilitating the archaeological work. Special thanks are due to Gary Rogerson for his role in co-ordinating the archaeological fieldwork with the construction programme, ably assisted by Georgina Hammond of Amey Consulting. We would also like to thank John Jones (Excavation) Ltd who stripped the site in advance of fieldwork.

The archaeology programme has been monitored by Rob Bourn of CGMS acting for the Highways Agency, advised by Kent County Council Heritage Conservation. From KCC we would like in particular to thank Simon Mason, Lis Dyson and Andrew Richardson.

We would also like to thank Shorne Wood Country Park for the use of their facilities for the public exhibition in May 2007.

Archaeological research on the discoveries is still in progress, and we would also like to thank all the specialists who have contributed information to this report, and in particular conservator Dana Goodburn-Brown.

Tim Allen and Leo Webley wrote the text, Magda Wachnik and Lucy Martin photographed and drew the finds, Julia Moxham drew the maps, Mark Gridley drew the reconstructed scenes and Peter Lorimer created the computer-generated reconstructions of the finds.

The Archaeology of the A2 Pepperhill to Cobham Scheme is designed and published by Oxford Archaeology.

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- Keep a safe distance – there could be queues in front.
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