Worthing Archaeological Society Journal

Volume 3 Number 8
May 2008

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Dear WAS Members,

Welcome to the Summer 2008 edition of the journal. It has been some time since the last publication but I am sure the wait will have been worth it, the fields of archaeological articles are very varied in this issue, many are local articles and some from further afield, which all help give a varied spectrum of archaeology.

Since the last copy of the journal was published there has been a lot of activity within the field unit, we have been undertaking a very varied amount of work across West Sussex.

Some of the projects are on going and others have come to a end, we have been working with English Heritage at Rewell Wood (Gobblestubs Copse), this work on the Iron age enclosure has for the time being put on hold, but Pete Skilton together with Ian Alison have finalised the plan of the enclosure, and it is very impressive. We hope to go back to this area at some point in the future.

The major excavation at Walberton carried on this summer and is proving to be an exciting site; there is more about this in Keith Bolton's field unit report in the journal, together with other reports concerning work with the field unit.
Some of our members have been undertaking part time study with the university of Sussex in the areas of archaeology, and it is with great pleasure that I can say and congratulate two of our members who have gained MA,s they are Sally Mounstevens and Pat Jones, a well deserved award for all their hard work, many other members are at present undertaking study with the University in various areas of archaeology.

It was with regret that the Autumn social had to be cancelled, I understand that this is the first time this has happened, but it was due to lack of ticket sales, so it is planned to have a Spring social instead, around May/June time, you will all be notified well in advance of a new date.

To keep up with what is happening within the field unit, log in regularly to our websites, addresses on every page.

I have often been asked recently about what is happening within the main society!, well the main society as far as I am concerned is not a separate entity, its all the same society, the field unit is really about undertaking archaeological work in all its forms, and in my view is the society, just a different name, undertaking field work, originally why the society was set up in the 1920s.
The social part within the society I would admit has changed, but this is due in the main to our membership which is more diverse than that in the past, we now have members covering all areas within West Sussex and further a field into Hampshire. The coach outings over the past few years have proved difficult to run and even break even on ticket sales, so the decision was taken not to run them anymore, perhaps with certain exceptions, like this February's Tutankhamen Exhibition.

For more articles why not log into our new journal on line, it can be found at http://arch-news.blogspot.com if you have an article you would like to post, then forward it to me and I will put it up, the site gets a good number of hits.

I would like to thank all the contributors to this edition of the journal, and a special thanks to long suffering Louise Partridge who undertakes the layout for the journal, and puts up with me often adding articles at short notice.

In future this journal will be published in April/May and October/November each year, with occassional news-sheets and a January news-sheet to inform members about activity for the new year.

RODNEY GUNNER
EDITOR
April 2008

Newsletter note 11/2007

SOCIETY ARCHIVES

A part of the Society's field work is collecting and maintaining archive material.

Some of the work carried out by society members in the past was never properly recorded. There is also an untapped fund of anecdotal material relating to the work. Some older members may recollect 'a bucket named Prue' which often promoted a little humour.

Roy Plummer with his computer – assisted by Daphne Palmer with her prodigious memory for people, are currently gathering any snippets of information from anyone who participated in excavations and other field work prior to the year 2000.

Many of you have been sent a letter, with a return form – intended to be helpful. Please complete the form and return it if you have any information – from memory or notes taken at night school or on any of Con's excursions to excavations. If you did not receive a form then please contact either Roy or Daphne. They will be available at this years winter lectures.

Remember any little snippet of information is useful because it often leads on to other sources and any little anecdotes help to capture the spirit of the time.

ROY PLUMMER

BLACKSMITHS CORNER, WALBERTON - SUMMARY OF EXCAVATION 2007

Following the excavation undertaken by the Field Unit in 2006, the second season of excavation on the Romano-British site at Walberton took place over two weeks in August-September. As part of the excavation there were (among other things) three things that needed clarification:
1. Was the layer located on the NW of the site a structure or just a demolition layer.
2. Was the wall foundation that appeared to run E-W away from the building an indication of a west wing or external structure
3. Why were the foundation in the southern area of the building so much deeper than elsewhere on the site.
The area opened for excavation was for the Field Unit the largest yet – 90 square metres. Thankfully the topsoil was removed by machine (many thanks to John ? for organising this) and due to the skill of the survey team the area opened was right on top of the 2006 excavations.

The building glimpsed at last year was revealed and we were able to uncover a number of wall foundations, including some hinted at by the resistivity survey done in 2006. The excavations revealed three main rooms divided by two sets of foundations, which could be possible staircases or remnants of rebuilding.

The location of the two north-south external "corridors" was confirmed and in the SE corner of the building a possible E-W corridor was identified but had been badly robbed out.

The middle weekend was opened to the public with over 150 visitors coming to the site, including a number of enthusiastic children who took part in trowelling their own area.

The area opened uncovered the lower two-thirds of the building including two areas of interest, which we were unable to fathom out in 2006. The first of these was the apparent increase in depth of the foundations towards the southern part of the building. Initially we believed that this was due to rebuilding or due to problems with the ground. However, two 'sondages' excavated at the end of the excavation revealed that the supposedly shallow foundations at the northern end, are in fact 0.8m deep.

The second area of interest was a curved apse feature to the SW of the main building although not fully excavated, it is possible that this is the remains of a bathing complex. Only further excavation will tell.

In terms of finds, we did not get the full range of metal objects located in 2006, with CBM and pottery being the main finds.

Acknowledgements
Thanks once again to Mr Wishard for allowing WAS Field Unit to undertake the excavation on his land. Also to the volunteers, especially Gill Turner and the finds team and the 6th form students from Boundstone college for assisting on the open weekend.

KEITH BOLTON
FIELD UNIT DIRECTOR

PARHAM HOUSE - TRIAL EXCAVATION JULY 2007

In the spring of 2007, Worthing Archaeological Society was approached by Parham Estate to undertake field work based on the geophysical surveys carried out by Archaeological Prospection Services of Southampton (University of Southampton).

The area under investigation was the current picnic area to the south-east of the main house. The resistivity survey identified a number of anomalies and in late July 2007 the Field Unit carried out a 4 day trial excavation of the most promising of these.

Four trenches (A-D), each measuring 3.0m x 1.5m were excavated, the location of the trenches based on the geophysical survey. However, three of the trenches contained nothing of significance, with only trench C containing a feature. The feature consisted of a curved area of burnt clay.

Unfortunately time constraints meant that we were unable to determine the full extent of it.

The top soil in each of the trenches consisted of a fine loam up to 1.0m in depth that fortunately was easy to dig as we had to backfill each trench a day after excavating it.

Having completed this excavation the next project on the Parham estate will be to locate the Deserted Medieval Village (DMV) supposedly located near the Tudor house.

KEITH BOLTON
FIELD UNIT DIRECTOR

NEW FIELD WORK AT BEEDINGS

The first archaeological discoveries on this spot were made when Dr John Harley constructed an imposing crenellated house on farmland at an elevated site on the Greensand escarpment north of Pulborough near the hamlet of Nutbourne. Originally just known as "Beedings" this building is now called Beedings Castle. Dr Harley kept a showcase of many artefacts recovered during the building process and in fact published a short note in SAC on "early cremations" from the site. Unfortunately following his death his belongings were auctioned, but a Miss Harley purchased several lots and donated them to Barbican House Museum

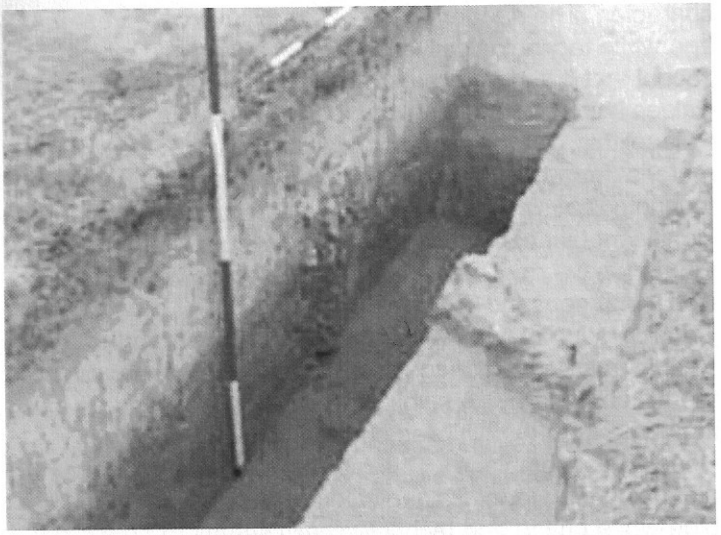
Beedings Castle

In the 1960's and 70's when the Gazeteer of Mesolithic sites was being prepared for the CBA, Roger Jacobi found the box of sundry artefacts, complete with original "showcase labels", and realised the flint artefacts belonged mostly to the Upper Palaeolithic, and published one account in 1986 and another in 2007.

During the 1970's -1990's the late Con Ainsworth of Worthing took an interest in the site and on several occasions had contact with the then owner of the Castle and surrounding land, Mr Tracey Judd. Judd engaged in developments on site including terracing a car parking area in front of (north of) the Castle, and also building a bungalow called Beedings House, and landscaping the garden with a JCB. On at least two occasions Con Ainsworth with Worthing Archaeological Society volunteers, and once with Roger Jacobi in attendance, excavated or rescued material from those locations. This work found no Upper Palaeolithic material, just flintwork from Mesolithic and later prehistoric periods, but it did rescue artefacts of Late Iron Age date. Late Middle Iron age decorated pottery including decorated saucepan pot sherds were found and Dressel 1A and 1B amphorae sherds, particularly rims and handles of those vessels. This identification has been confirmed by Dr David Williams of Southampton University and a thin-sectioning analysis carried out on a sample of sherds by a student. 1st century AD Arun Valley wares or similar have also been found.

After 2000 the properties changed hands. New developments undertaken at Beedings House received PPG16 evaluations and watching briefs on two occasions directed by Neil Griffin and Chris Butler respectively and various disturbed or truncated pits and linear features were recorded adjacent to that house, with late iron age and roman artefacts. Not enough remained to make a useful interpretation of quite what level of prehistoric activity or settlement occurred here in those centuries. One feature may have been a continuation of a deep ditch observed briefly by Con Ainsworth which had raised hopes of a well-marked enclosure on site, but that idea cannot be sustained at present.

Undeterred by these difficulties, Caroline Wells initiated firstly three geophysical surveys, west, south, and east of Beedings Castle, and then a small trench in the field to the west. The geophysical surveys (carried out by the late David Combes (1) and BHAS (2 & 3)) produced nothing but geological signatures. The trench was designed to establish if the stripey pattern seen was the geological fissuring identified nearby Roger Jacobi in 1986. This was confirmed. In addition a place was found for Nick Debenham to sample as background data for a TL date on archival burnt flint of Upper Palaeolithic date (see Jacobi 2007).



Beeding Trench

In 2007 it was announced that the fields both to the east and west of Beedings Castle were to be sold, news which created a sense of urgency should a future, uncooperative land owner be less amenable to further archaeological investigations on the hill. So with the permission of Mr Judd and the blessing of the residents of Beedings Castle a further, and possibly final, season of field work was hastily organised under the collaborative direction of Matt Pope of the Boxgrove Project and Caroline Wells. For this work it seemed entirely appropriate to draw upon the expertise of Worthing Archaeological Society given both the successful collaboration of the Boxgrove Project and the society at the Valdoe in 2005 and the history of Con Ainsworth's pioneering excavation at the site.
Excavations were focused on the field immediately to the east of the Castle. Here the geophysical results appeared initially far less promising than the ordered configuration of geological stripes which were seen in the western field. However, in revisiting John Funnel's interpretation of the plots it was seen that just possibly a large linear feature was present to the north of the field, a feature which might just prove to be an Iron Age ditch or geological fissure.

In all three trenches were opened up, one sited on a localised anomaly, another across a small linear feature similar in nature to the stripes in the western field and a further trench across the larger linear feature. The first two trenches showed only superficial deposits filling geological bedding structures and contained little other than Mesolithic flint work and a single piece of Samian ware. The larger trench revealed a geological feature of a different character, a 3m wide fissure in excess of 3m deep filled with fine grained sediments of a loessic nature. This feature too had a unique archaeological signature containing a small but significant assemblage of blue-patinated, sediment polished flint including large flake elements, a scatter of possibly in-situ retouching spalls and a single element of a large, non-Mesolithic blade.

Whilst small, the assemblage presented some surprises. Aside from the blade element, which could perhaps sit happily within the original Upper Palaeolithic assemblage from Beedings, the additional material is of a quite different character. The deeper patina is suggestive of a greater age while technologically it has been suggested by Roger Jacobi that it has far greater affinity with the Late Middle Palaeolithic (LMP) technology than with the Early Upper Palaeolithic. An initial comparison of theses pieces with material from the LMP site of Oldbury, Kent confirms both technological similarities and almost identical patination. A significant fact considering that the Oldbury site material too may have been associated with fissures within the Kentish Greensand.
Consideration of two relevant previous finds from the Beedings area also suggests a Neanderthal presence on the hill and nearby. A single artefact, provenanced as having come from the hill, was curated within the original Beedings assemblage. This artefact sits uncomfortably alongside the Upper Palaeolithic artefacts in that it bears a blue-white patina and technologically seems to be a large side scraper, manufactured on a large flake with indications of working at the tip of the piece. Typologically it is a piece which would sit better with a Late Middle Palaeolithic assemblage; and yet until the 2007 excavations there had been no hint of further LMP artefacts from the hill. In addition, a single finely made sub-triangular or Bout Coupé biface, typical of LMP assemblages from Britain was found, in an identical topographic position, at the top of the Lower Greensand scarp-slope at Woods Hill, West Chiltington, only 2km to the east of the site. These finds, interpreted alongside the possible in-situ artefacts from the Beedings fissure suggest that Neanderthals may have been using the hill as a game observation post or hunting camp prior to the arrival of the early Upper Palaeolithic hunters.

Beeding Trench 2

These new finds are of potential national significance. Not only do they suggest continued survival of Palaeolithic material on the hill, they suggest the preservation of successive lithic assemblages covering the potential replacement of the last Neanderthal hunters of the British Isles with early Upper Palaeolithic peoples. Further excavation planned for the summer of 2008 hope to throw further light on this unique site and will also form the basis of an EH funded review of potential for similar sites fringing the Weald to be carried out by the Boxgrove Project in the coming year.
It is hoped that the expertise and professionalism of the WAS can be called upon again to assist in this work and to build upon the earlier enthusiasm of Con Ainsworth, to finally reveal the true nature of the site over a hundred years after its discovery.

Matt Pope and Caroline Wells would like to express their gratitude to the society in assisting us with the excavation. Especially to Keith Bolton for organising the logistics, Pete Skilton and Ian Allison for their efforts in reconstructing the site grid, Gill Turner for her careful recording and curation of the small finds and to Bob Turner for his wonderful section drawings. We would also like to thanks the residents of Beedings Castle for their continued support and enthusiasm for the work and also to Mr Charles Outhwaite, the new owner of the western field who has agreed to field walking ahead of Vineyard planting to take place early in

2008. We would also like to acknowledge the geophysical survey carried out by BHAS at the site. A survey which at first discouraged us in not conforming to our expectations, and then turned out to exceed them.

DR. MATTHEW POPE
Senior Research Fellow
Boxgrove Projects
Institute of Archaeology.

ANCIENT TOMB OF YOUNG LOVERS ENEARTHED IN TURKEY

Archaeologists discovered the tomb of a young couple locked in an embrace during their work in Hakemi Use in the Bismil district of the southeastern province of Diyarbak_r (Turkey). Archaeologists assert that the couple, who presumably died some 8,000 years ago, is likely to set a record as the oldest embracing couple in the history of archaeology. Diyarbak_r was witness to an extraordinary discovery when archaeologists revealed the tomb of the couple near the township of Tepe in the district of Bismil. The shroud of mystery over the couple will be removed after anthropologists examine the skeletons.

The site at Hakemi Use, 70 kilometers east of Diyarbak_r on the south bank of Tigris River, has been under excavation since 2001 by a team of archaeologists led by Halil Tekin of Hacettepe University.
The team's objective is to rescue artifacts at the site before the area is flooded by the Il_su Dam. Salvage efforts were launched with the initiative of the government after the dam project was introduced in the region. The main site of excavation at Hakemi Use is a mound of 120 meters in diameter and four meters high dating from the Late Neolithic period.

The discovery of the tomb of the two lovers has sparked a wave of excitement among the team of archaeologists. Halil Tekin, head of the team, has indicated that the tomb is at least 1,000 years older than the one found last year in Verona, Italy. "The excavation work at the Hakemi Use site has been underway since 2001. We have recently discovered a tomb bearing the skeletons of a 30-year-old man and a 20-year-old woman. The way they were buried signifies that they were lovers. An illness or even a crime of love may have been the cause of their death. We will learn much more about them after anthropologists in our university complete their examinations on the skeletons.

Source, Ankara news today.

ARCHAEOLOGY'S ALLIES

Does public interest in archaeology get in the way of the work.
Archaeology is becoming more popular year on year. But some say the public gets in the way of serious and very long term research.
Archaeology needs public support to justify its work, which most of the time doesn't find a headline-grabbing treasure-filled tomb. It also needs to ensure that it can justify the public money that is spent on its activities, again despite what many would see as humdrum discoveries punctuated only occasionally by spectacular finds. But with metal detectors remaining highly popular and archaeology documentaries attracting audiences in their millions, any dig anywhere in the world is highly likely to attract more than just useful interest. It will also attract crowds of people who, however keen, are not professional archaeologists, and that could lead to possible interference with the serious work of the diggers and scholars.
Now archaeology is slow, painfully slow. If you had turned up at the beginning of Howard Carter's now legendary dig in the Valley of the Kings which eventually discovered King Tut, you would have spent many years being disappointed, as indeed he did, before the dedication finally paid off and the greatest archaeological find of the century slowly emerged.
But driving people off in case they get in the way is not going to endear archaeologists to the public, or to the public purse. It's all very well waiting until the work is done and the finds are documented and properly recorded before opening some kind of visitor centre, but the interest that will fill the centre with people begins as the first finds are uncovered, and must somehow be maintained while the often very long drawn out process of work goes on.
Metal detectors are fine as part of that work provided they are either only operated by the archaeologists themselves or by individuals licensed or otherwise supervised by the professionals. Electronics play a major role in modern archaeology and anyone with appropriate electronic knowledge would be useful, but in a supervised manner.
This is where the documentaries themselves can help. Take one, the weekly TV programme Time Team on the UK's Channel Four in which a group of archaeologists, most of them leaders in their field, have three days to make initial excavations of a site the public has called its

attention to and to draw initial conclusions.
The public is encouraged to take an interest and come and watch the excavations, but the tapes around the site clearly tell them that the place is off limits while the work goes on. At the end of the three days the public - and the viewers - are taken through the finds and the conclusions. No-one gets in the way and no-one is disappointed.
Now the programme and its spin-offs have expert and scholarly critics who think that a three day "celebrity" dig is beneath them and demeans archaeology. I can see their point, but the result of this kind of "celebrity" archaeology is that the discipline has attracted more interest than a standard dig and report would have done. That support could justify the spending of further public money and maybe, just maybe, a young viewer would be attracted to the work of an archaeologist and train to be one. And in most cases, local archaeologists' continue the work the Time Team operation has opened up.

JOHN STUART REYNOLDS, is a freelance archaeologist ,and journalist.

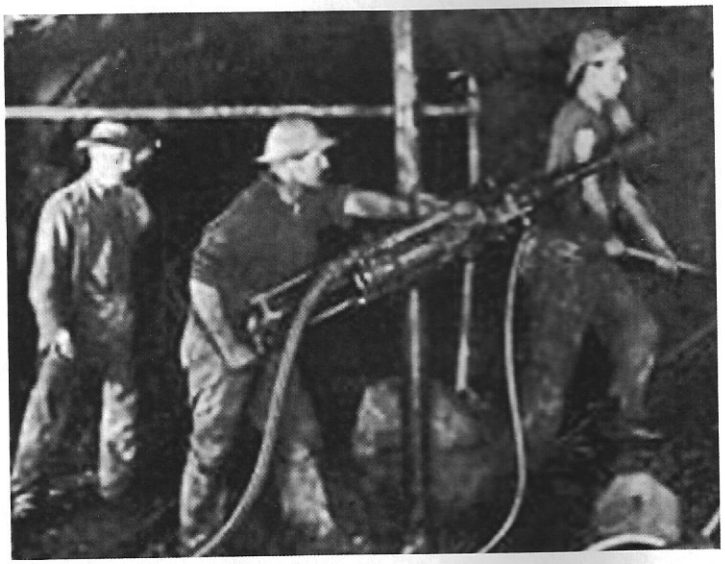
THE HISTORY OF THE CORNISH MINING INDUSTRY

The history of mining in Cornwall is a long and fascinating one involving many metals with tin and copper by far the most important. It started in the Bronze Age and finally finished in 1998 when the drop in tin prices led South Crofty to close. This was a mine which had been active for 300 years.

Although mining in Cornwall lasted over 4000years the period of greatest activity was the 18th & 19th centuries when it was a world leader with copper far more important than tin. This period saw great wealth coming out of the ground and much technical innovation mostly connected with the use of steam.
The Beginnings.
Although copper mining produced more tonnage than tin it had little impact until the 16th century. Tin however was produced from the early Bronze Age but up to the Medieval period little actual mining was done. The method used was the streaming of large alluvial deposits which contained casserite (a tin stone) . This was eroded from the many outcrops and washed into the many valleys. Bands of sand and gravel containing the ores were laid down in layers and the tin bearing ones being much heavier than the sands and gravels were left behind when the lighter sands were washed away.

Several methods were used depending on the slope and width of the valley. As was mentioned above the bulk of the raw tin material was washed away leaving a tin concentrate which was removed to the dressing floor where a number of round settling tanks called" buddles " were used to grade the tin. This was the main tin collection method until the 1300's when the alluvial deposits were becoming depleted and this state of affairs coupled with improvements in mining practices had led the start of mining on a commercial basis. It is true to say that in the 13th to 15th centuries most mining took the form of open cast mining but in the late 16th century shaft mining became much more common. Although the improvement in mining technology led to improved production the main problem which the industry never completely solved was mine drainage. All Cornish mines were wet and good mine drainage was vitally important. One of the main breakthroughs in the early 18th century was the "adit ", a waterwheel based system. The best example was the county adit which was based in the Cambourne and Redruth area. This was developed by one of the great mine owning families. It eventually covered 16 sq. miles, had 40 miles of adits and drained over 60 mines.

This scheme coupled with the entry of steam was to prove the gateway to Cornwall's greatest mining period.



Drilling Mine

Although Cornish mine owners were relatively prosperous the environmental effects were far from good with the despoilation of the landscape . This coupled with the pollution of all the water courses and appalling living and working conditions made life difficult. However with the fluctuation in tin and copper prices the whole industry had little security of employment.
!9th century changes and vicissitudes.
This was a very important period as until1870 it was the worlds leading producer of copper ore and refined tin, indeed between 1815 and 1910 Cornwall produced 5,000,000 tons of copper ore (most of it smelted in South Wales) and 250,000 tons of refined tin (which could be as high as 80% pure). These figures illustrate the vital importance of this industry to the British economy of the 19th century.
1800 represented much more than the end of a century. For Cornish mining it meant the end of problems of Anglesey copper, the end of Watt's steam patents with the last item bringing amazing creativity by mining engineers leading to the most productive period ever. These improvements led the mining families to eradicate the dominance of outside smelters particularly in the copper trade.

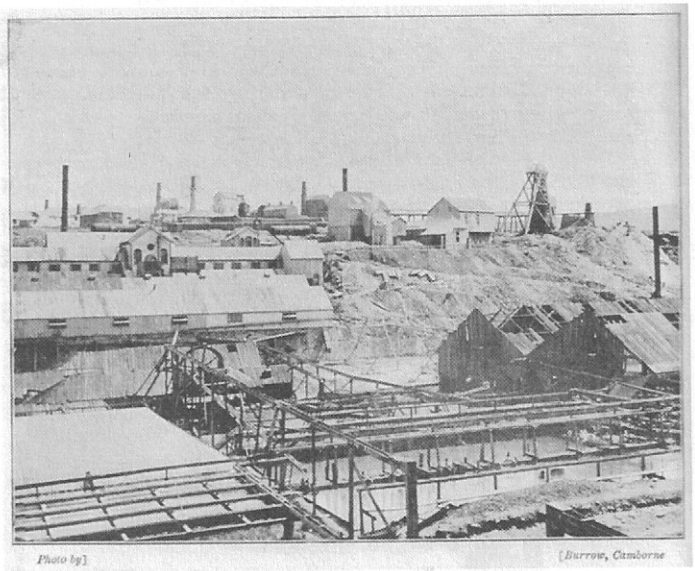
Dolcoath Underground

They took control of their own destiny by moving money into Welsh smelting and thus gaining control of smelting which they retained for over a century.

As prices rose mainly due to the Napoleonic Wars mines reopened. New discoveries unexploited in decades of low prices were processed. Thus Cornwall became again the biggest producer of copper.
As the century progressed improvements in both engineering and transportation led to improved production and by the middle of the century steam engines were in widespread use in drainage,skip haulage,ore crushing,ventilation and even transport. (a look at the diagrammatic sketch of a mine shows the complex nature of mining at this level.)
As we approached the 1830's serious problems were affecting copper production . Reserves were running out but fortunately large new deposits were found as mines went deeper. From 1860 to the end of mining in Cornwall tin production outstripped copper production and was more modern and efficient particularly with the introduction of pneumatically driven power tools.

Transport.
As production increased a major problem was transport with ore going out and supplies coming in (coal for steam plant being extremely important). Traditionally mule trains were the time-honoured method but as the century progressed drastic improvements were needed.
A mine owner Francis Basset wanted to connect his mines in Cambourne with his port in Portreath and by the 1820's a tramway had been built (horse drawn of course)This proved a great success and indeed before it's inception some 1000 mules carried ore into Portreath but the tramway in a short time was easily carrying 25000 tons annually.
This led to the Redruth and Chasewater railway which was 9 and a half miles long and in it's first 50 years handled 3.7 million tons of freight. It was horse drawn from 1825 to 1855 but after that it was steam driven and closed in 1915 some 40 years after the end of copper mining at Gwennap. The success of this led to others, notably in 1837 Hayle to Portreath, now part of the rail system. This line linked the most important mining areas with the principle engine builders and tool suppliers, notably Harveys for engines and Tuckingmill for safety fuses and Holmans for pneumatic power machinery.
Much remains of these industrial sites. They are an industrial archaeologist's dream and can be easily explored on foot.
Although much money was made by Cornish mining families this was not reflected in the conditions of the mineworkers either underground or on the surface.

Conditions underground particularly in the early days were abominable with high temperatures, poor safety, bad ventilation and a great deal of travel mostly on ladders to get to the workplace. Even in the 1830's mines were approaching 1500 feet and it does beggar belief that the average miner would have to climb down 1500 feet of ladder, do a shift and return the same way.



Dolcoath Mine

But by far the worst part particularly on the north coasts was the last 200 feet outside. The temperature difference particularly in exposed winter conditions was lethal after a shift in temperatures approaching 100 Fahrenheit .
To get over this problem, as the mining families were aware was not easy. However one of the solutions was the man engine, a reciprocating shaft extending all the way to the mine bottom with platforms to step on and off. It was a far from ideal answer but it had a good record in Cornish mines. Although one of the worst disasters in Cornish mining history was when the shaft at Botallack broke killing 31 miners . But in spite of this it was one of the biggest boons and it most surely lengthened the life of miners by eliminating that murderous climb after an exhausting shift in hot conditions.

Surface Working.
Conditions on the surface were not a great deal better with incredible noise from the stamps and ore crushers followed then by filtration, washing and sorting mostly done by women. To complete these tasks an enormous amount of water was needed mostly drained from the mines.

Conditions would have been horrendous with ore heaps, a multitude of steam engines, pollution, noise and poor air quality. And if that wasn't enough in the 1860's the collapse of copper mining in the villages near Redruth led to many mines closing. Indeed one of the most famous the enormous "Consolidated & United "closed in the 1870's with the loss of over 3000 jobs.

The Last Rites

Judging by the tonnage produced, mining production peaked in the 1860s and 1870's. At that time some 340 mines were in operation 40% mining tin, 20% mining copper and 25% mining both. The remainder mainly the smaller ones were mining lead, arsenic and iron. The direct employment excluding supporting staff was in excess of 40,000 with some of the larger mines having over 1000 workers.

From these halcyon days it was downhill with the main culprit the First World War. After the outbreak of war most miners joined up leaving insufficient staff to effectively run the mines. Consequently no exploration was done. This coupled with drop in metal prices caused havoc and when the war ended only 20 mines were still operating. Even Dolcoath the most successful mine for over 100 years was struggling. The last straw was the depression in the early 30's.

Some attempt was made after the Second World War and things were looking good. New lodes had been found but alas the drop in tin prices brought the death knell with Geevor closing in the mid 90's and South Crofty in 1998. The end of an era.

Crofty

Environment.

The residue of mining is everywhere with mine workings, engine houses and industrial remains providing a wonderland for industrial archaeologists but at what a cost. But what is left does not give a true picture of life say in the early 1900's. Today we see the atmospheric pictures of gaunt engine houses but a glance at the diagram of a modern tin mine indicates that surface dressing for each mine requires a great deal of space.

Working conditions in this space judged by today's standards would have been very unpleasant. The noise particularly from the stamps and ore crushing would have been unbearable.

Pollution was endemic with the smoke from the engine houses (some 600 in Cornwall at the time). It was impossible to keep dry as processing tin required enormous amounts of water usually drained from the mine. Surface workers were usually female, many of them very young. In addition there was despoliation of the land with ore heaps containing high concentrates of heavy metals and many toxic chemicals.

It must be emphasised that all these areas were in the middle of centres of population and as an illustration just behind Cambourne is an Iron Age causeway camp with a statue of Samuel Bassett a well known mill owner. Today from this statue you can see the remains of 20 mines. In 1900 there would have been 100 most still working. The conditions for living and working would have been indescribable.

Plant and Wild Life

The final chapter brings some optimism, as there is a surprising amount of wild life in these abandoned workings in a hostile environment. However they have been colonised by many plants. One of the most common is heather with its liking for acid soils. Of the some 600 mosses found in Cornwall almost half are found among the industrial remains.

These sites are also of great value to mammals particularly bats, reptiles, amphibians, slow worms and invertebrates i.e. grasshoppers. Certain types of butterflies and moths are also found.

It is a fascinating story, one that has changed enormously over the last 100 years probably for the better.

P.S. the mining heritage does still exist. Geevor which closed in the early 90's has reopened as a museum and a visit there is a fascinating experience. The National Trust with the Trevithick Trust has restored the Levant engine house and has a fine museum in Cambourne with two working beam engines.

ERIC ANDERSON

Acknowledgements
The Cornish Mining Industry by J.A.Buckley.
Cornish Mining Underground by J.A.Buckley.

EGYPTOLOGIST - JEAN-FRANCOIS CHAMPOLLION 1790 - 1832

Champollion was a French Egyptologist, who is acknowledged as the father of modern Egyptology. He achieved many things during his short career, but he is best known for his work on the Rosetta Stone. It was his deciphering of the hieroglyphics contained on the Stone that laid the foundations for Egyptian archaeology.

He was born in 1790. His oldest brother educated him until he turned 10, at which time he was enrolled in the Lyceum in Grenoble. His brother was also an archaeologist, and it is probably from his influence that he developed a passion for languages in general and for Egypt in particular. While he was at the Lyceum, he presented a paper in which he argued that the language of the Copts in contemporary Egypt was in essence the same as that used by the Egyptians of antiquity.

His education continued at the College de France, where he specialised in languages of the Orient. He knew bits and pieces of many languages, and was fluent in several others. A partial listing of the languages he was familiar with is astounding: Hebrew, Arabic, Syriac, Chaldean, Chinese, Coptic, Ethiopic, Sanskrit, Pahlevi, and Persian.

When he finished his education, he was invited to teach at the Royal College of Grenoble, where he taught history and politics. By the age of 19, he had earned his Doctor of Letters and his career began really taking off. He continued to teach at Grenoble until 1816. In 1818, he was appointed to a chair in history and geography at the Royal College of Grenoble, and taught there until 1821.

While he was teaching, he continued his research on ancient Egypt. He began to be noticed by others, and that resulted in his appointment as the conservator of the Louvre Museum's Egyptian Collection in 1826.
In 1828, he began a year-long trip to Egypt. He travelled with one of his students, Ippolito Rosellini. Rosellini was an Italian, who became a fairly well-known archaeologist in his own right. While they toured Egypt, Champollion took detailed notes of what he saw. Rosellini did the same, although his medium was engravings/drawings, and not words. The notes and engravings they left behind are still regarded as some of the best ever done. Together, they preserved a lot of information that otherwise would have been lost.

In 1831, the First Chair of Egyptian antiquities was created for him at the College de France, and he became a member of the French Academy. Sadly, he didn't get to enjoy this coveted post very long. He died of a stroke in 1832. Champollion was a French Egyptologist, who is acknowledged as the father of modern Egyptology. He achieved many things during his short career, but he is best known for his work on the Rosetta Stone. It was his deciphering of the hieroglyphics contained on the Stone that laid the foundations for Egyptian archaeology.

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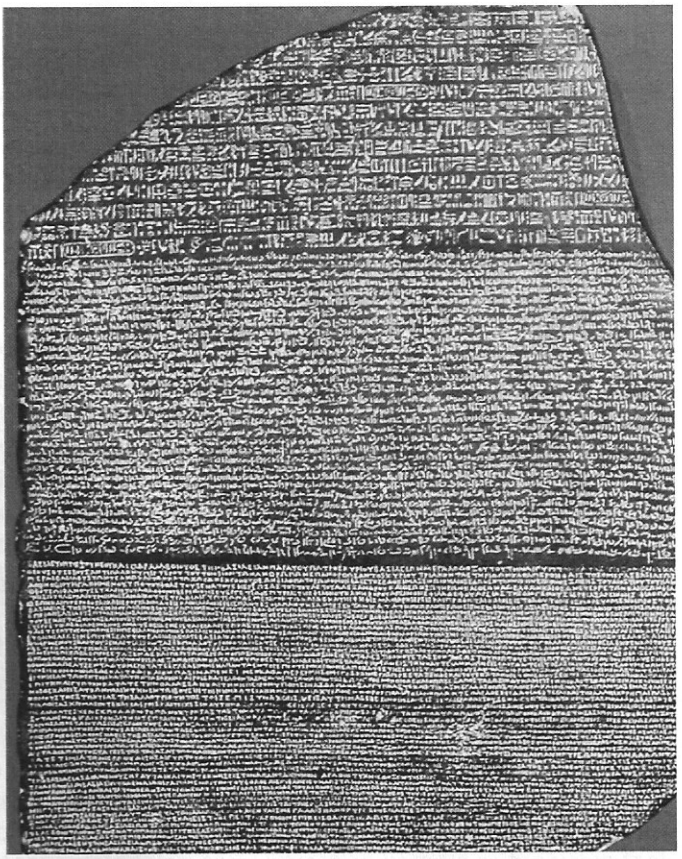

Rosetta Stone

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DR. SHERIN ELKHAWAGA
Egyptian Radiologist.

ENGLAND (the land of the Angles) was born in the 7th century, a new country made up of a number of rival Kingdoms.

The Kingdom of Northumbria
The northern-most of the Anglo-Saxon kingdoms, Northumbria's southern border ran along the river Trent, a bit south of York, and went straight across the island. Its lands stretched north to Edinburgh, but did not include large chunks of the west, which were still held by the British Kingdoms of Rheged and Clyde. Northumbria became a permanent, independent state under the rule of Aethelferth. It would also be lead by the notable Kings: Edwin, Oswald, and Oswy.

The Kingdom of Mercia
Mercia was the largest of the Anglo-Saxon kingdoms. Its northern border was the same as the southern border of Northumbria. In the west, it bordered the British Kingdoms of modern Wales. To the south, the kingdom ended at the River Thames and looked south upon the West Saxons (Wessex). It also shared borders with the smaller Kingdoms of the East Saxons (Essex) and East Anglia. Although the largest, Mercia was not as unified as some of the other kingdoms in the early years of the 7th century. It would begin its rise to power under Penda, the last great pagan king of the Saxons. Soon afterward, it would take its place as the most powerful of the Saxon Kingdoms and hold this dominance until the Danish invasions. Mercia's most famous king was Offa, who constructed the great Dyke along the border of Wales.

The Kingdom of the West Saxons (Wessex)
Wessex (which is also know at this time as the Kingdom of the West Saxons) sat just below Mercia, between the British Kingdom of Dumnonia on the Cornish Peninsula and stretched east nearly to London. During the 7th to 9th century, Wessex was rarely a unified state, and was usually under the control of a number of under-kings, though occasionally a strong leader would unify them. Wessex would truly come to the fore during the Danish Invasions when the Mercian Kings (most notably Alfred the Great) would be forced to retreat there in order to launch their counter attacks.

The Kingdom of East Anglia
Despite being one of the oldest of Anglo-Saxon Kingdoms, little is known of the Kingdom of East Anglia for it left no written record. It seems to have covered an area close to that of modern Anglia. It's most famous ruler was Redwald, who is thought to be the king entombed at Sutton Hoo.

The Kingdom of Kent
The original Anglo-Saxon colony established under Hengest, the Kingdom of Kent was small and mostly unimportant during the 7th-9th century. It never seems to have expanded much beyond the borders of the modern county of Kent. Interestingly, the people of Kent claimed to be Jutes (that is from Jutland) instead of from Saxony like the rest of the Germanic invaders.

Other Kingdoms
Essex (The Kingdom of the East Saxons), Surry, and Sussex (The Kingdom of the South Saxons) also seem to have existed as independent states during the 7th – 9th century though little can be said about them with any certainty.

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JOSEPH ALLEN McCULLOUGH

Joseph A. McCullough was born in the town of Greensboro, NC, site of the Battle of Guildford Courthouse. In 1994, he graduated from the University of North Carolina at Chapel Hill with a degree in History, specialising in military history and the English Dark Ages. Since then, Joseph has written both fiction and non-fiction for numerous publications.

In 2003, he put his life in storage and went to the University of Wales at Bangor in order to write and research a few lesser-known English Historical figures.

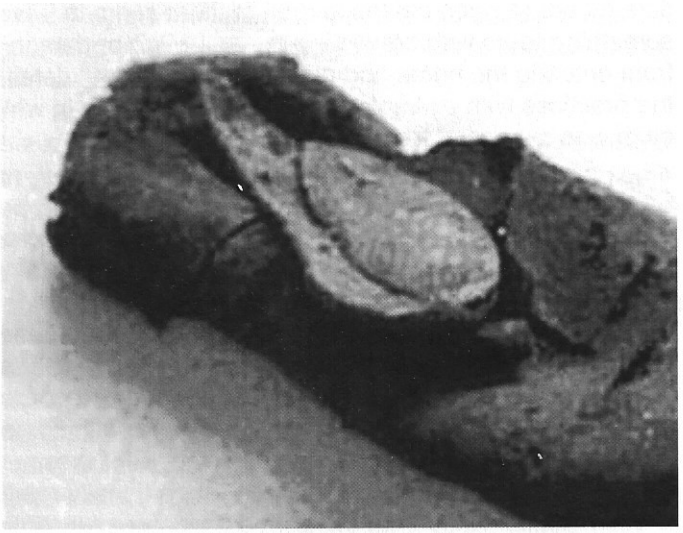
THE ARCHAEOLOGY OF FOLK MAGIC

"This article was originally published in 1999. For a more up-to-date account of Brian Hoggard's research please read his article, 'The Archaeology of Counter-witchcraft and Popular Magic' in Owen Davies' and Willem de Blecourt's (eds), Beyond the Witch-Trials - WItchcraft and Magic in Enlightenment Europe, 2004, Manchester University Press, pp167-186. You can also visit his website at www.apotropaios.co.uk "

In this article I hope to draw to the readers' attention to a little known field of study known as the archaeology of folk magic. This is intimately related to what most people call witchcraft and involves the physical remains related to practices undertaken by the 'white' witch to protect people's

property from 'black' witches and also practices which lay-folk undertook by themselves for the same reason. There is a bias of material in my collection to the 16th and 17th centuries, this is because this is the focus of my PhD and also because it is when there was the most fear about witchcraft - hence more archaeology relating to protection. Where material is not dated assume that it comes from these two centuries. Before beginning with a description of the finds and theories about them, it is important that I set the context for the topic.

Historians are getting better at writing about witchcraft. About thirty years ago there was still a tendency amongst them to use exclamation marks when talking about the horrors of torture and to dismiss the belief in witchcraft as primitive heretical superstition or as over-enthusiastic religious faith. A classic and highly respectable work entitled The Encyclopedia of Witchcraft and Demonology written by Robbins in 1959 has some of these hallmarks. (1) While they were correct by our modern standards to be horrified by the tortures that occurred they did not attempt to compare the 'witch-craze' to Stalin's purges or the holocaust or other comparable situations. Now we have books like Religion and the Decline of Magic by Keith Thomas (2) which details the practices of the village cunning-men and wise-women (the 'white' witches who were really slightly grey) and Early Modern European Witchcraft - Centres and Peripheries edited by Ankarloo and Henningsen (3) which collects together major articles which deal, among other things, with spirit flight and Icelandic witchcraft. There is no doubt that historians are getting closer to understanding the role that witchcraft served in the village community better now than they ever have before. Tanya Luhrman did an historical and anthropological study of modern witchcraft called Persuasions of the Witch's Craft (4) which involved becoming initiated into several covens and writing about her findings in an historical-comparative style. Diane Purkiss in The Witch in History (5) has clearly shown the problems that are encountered when dealing with the historical claims of Wicca, some of which are clearly slightly suspect. For example there was no such thing as 'the burning times' in England because all witches here were hung by the neck. She does, however, acknowledge the validity of it as a religion alternative to mainstream Christianity other religions. Other authors such as Norman Cohn in Europe's Inner Demons (6) have demonstrated that many of the fears generated in the period of witch-persecution were created by the ruling elite. For example it was during the period of mass executions that the belief in witches riding broomsticks evolved and also when notions of a witches Sabbath which parodied Christian church ritual came in to being. Eamon Duffy in The Stripping of the Altars (7) has demonstrated how Christian beliefs, which in many cases were very basic and superficial, were combined with folk beliefs very easily in pre-Reformation parishes. Here supernatural belief and a kind of polytheism through worship of the saints existed hand in hand with mainstream Christianity. This is the type of situation which Anton Wessels in Europe - Was it Ever Really Christian? (8) describes as broadly 'pagan-animist' in nature, not Christian at all. Books worth having whatever your preferred theories about the witch in history are those which reprint court records and other documents relating to witchcraft. The best and most widely available one of these is Barbera Rosen's Witchcraft in England 1558-1618 (9) which, as a prelude, has probably the best and most concise introduction to the study of witchcraft in existence. Another similar work, though sadly out of print, is Peter Haining's The Witchcraft Papers - Contemporary Records of the Witchcraft Hysteria in Essex 1560-1700. (10) There are many excellent books that contribute sometimes a little, sometimes a lot, to the witchcraft debate and these are but a few of the more important ones - many of which can be ordered at your local bookshop. These books all indicate the steps forward that have been made by historians in recent years to clarify the nature of witchcraft as it really happened in England - instead of the 'Winnie the Witch' cartoons, fairytales and Hollywood images of the witch that most of us have inherited from our childhood, not to mention all the other images and expectations of the witch generated by the apparently vast numbers of third degree witches who you can meet down the local pub. READ-up on the history before you join-up if you possibly can!



An area of witchcraft which hasn't been looked at very much at all is the archaeology of witchcraft. It is this which is the focus of this article. There has been work by some authors on this topic but they have tended to attempt to make the evidence fit their theories rather than let the evidence create new theories. The only person to have written a serious book on this is Ralph Merrifield whose Archaeology of Ritual and Magic (11) covers periods from the Neolithic to the nineteenth century - therefore he spends only a chapter, albeit a very good one, on the archaeology relating specifically to witchcraft. Many people have written interesting academic articles on the archaeology of folk magic which you will find listed in the references but Merrifield's is the only book worth getting hold of. The type of finds that most often occur tell us more about what people did to protect themselves against black witchcraft than what witches actually did. But the way in which people protected themselves against witchcraft seems to suggest the survival of much older belief system or practice which does (I think) tell us quite a lot about the nature of witchcraft and its origins. The finds covered by Merrifield in his book range from mummified

cats (dried) to witch-bottles and all of them seem to have something to do with preventing the evil witch or demon from entering the home and causing harm. I shall detail the practices with examples and describe the way in which each was supposed to work.

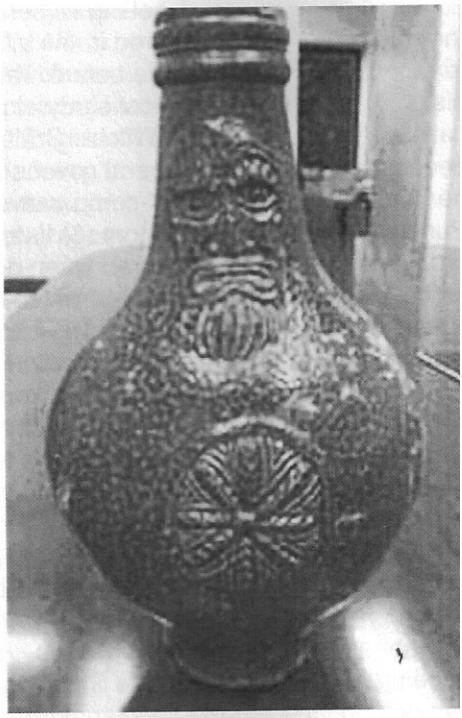
Concealed Shoes

The most common folk magic find by far relating to the protection of the home is that of concealing shoes in buildings. The Concealed Shoes Index at Northampton Museum receives an average of one find a month but curators there believe that hundreds of finds every year are simply thrown out by builders. (12) By February 1998 the index recorded over 1100 examples primarily from Britain, but with some from as far away as Canada. The date range for these finds is interesting and appears to be proportionally related to surviving buildings from the periods concerned, until the twentieth century when the practice appears to have gone into serious decline. For instance, pre 1600's there are around fifty examples, 1600-1699 around 200, 1700-1799 approximately 270, 1800-1899 around 500 and 1900+ (when the records appear to decline) around fifty (13) - but this latter may be because people either keep their concealed shoes secret or they have not had a reason to examine their chimneys yet. These shoes are usually found concealed in chimneys, either on a ledge a little way up the chimney or in purpose built cavities behind the hearth into which items can be deposited from above. These have been termed 'spiritual middens'. (14) Other places have included in walls, under floorboards, in window frames and in staircases. Nearly all of the shoes discovered in this context are well worn, half of those found belonged to children and only very rarely are pairs found. Shoes were expensive items and were repaired again and again until they could not be worn any longer. As a result of this the shoe was a unique item, perfectly fitting only the wearer at the end of use. Various theories have been put forward to explain why shoes were concealed in chimneys. One suggestion is that they were a fertility symbol. For example, Roy Palmer in his book The Folklore of Hereford and Worcester cites a very recent case from Broadwas-on-Teme where in 1960 a midwife refused to allow a young woman to remove her shoes until her child was born. (15) Merrifield, discussing shoes, noted the old rhyme, 'there was an old woman who lived in a shoe. . .' as being further evidence of the connection between shoes and fertility. He also quotes a case from Lancashire where it was apparently not unusual for women wishing to conceive to wear the shoes of those who had just given birth in the hope of 'catching' something of the wearer. Another slightly more bizarre account is a method once used by young ladies to invoke dreams of their future partners. They were said to pin their garters to a wall and arrange their shoes in the form of a 'T' and sing a short rhyme. (17) Just how successful this was I don't know but it reaffirms the link between shoes and fertility yet again.

When shoes are found beneath bedroom floors the above appears to be a likely explanation, but in other locations the following explanation seems more likely. Denise Dixon-Smith, who was Assistant Keeper of the Boot and Shoe Collection 1986-1990 states that, "One reason for hiding shoes in chimneys and around doors may have been because they were 'openings' where evil spirits could enter the home, and the shoe - as a good luck symbol - should warn them off." (18) She was not the first person to suggest this however. Merrifield in his book suggests that an unofficial Saint named John Schorn was partly responsible for the custom. Schorn was alleged to have performed the remarkable feat of casting the devil into a boot which Merrifield says may have led to shoes being seen as some kind of spirit-trap - this would explain the locations in which they are found. (19) Supporting evidence of the protective associations of shoes comes from Reginald Scot who mentioned that spitting on shoes was a way to protect against witchcraft. (20) A few shoes found have been vigorously slashed suggesting black witchcraft, not a spirit trap at all. The lack of writings from contemporary accounts about this apparently very common practice has baffled many people, but it is probable that secrecy was an important part of the folk magic protection. After all, you wouldn't want to risk letting a witch know how to avoid or switch off your spiritual burglar alarm would you? It is probable that the shoes were a kind of bait which 'contained' enough of the human to lure the witch into a dead-end in the chimney and have her trapped forever - witches were reputed to be unable to travel backwards. It is fortunate that June Swann began the Concealed Shoe Index at Northampton (21) for it has reaffirmed the importance of many of the other finds which are found in associated contexts and has generated a substantial revival of interest in this type of find.

Witch-bottles

Another concealed object often found, although nowhere near as often as concealed shoes, is that of witch-bottles. In some literature these are known as 'bellarmines' because the first kind of bottles used for this purpose were stoneware bottles with a face stuck on to them which people believed was a portrait of a man named Cardinal Bellarmine who persecuted Protestants. This theory has now been shown by M R Holmes to be untrue as some bottles pre-date the Cardinal by some time. (22) The basic facts about witch-bottles are quite amazing. The effort that went into placing them was quite substantial compared to that of shoes, which were merely thrown down a hole or perched on an existing ledge. Many of the earliest bottles have been found inverted beneath doorsteps and hearths.



They are not exclusively inverted but this seems to have been an important part of the practice in some areas. The most common components of the contents of a witch-bottle are pins and urine. Joseph Blagrave's Astrological Practice of Physick published in 1671 describes putting urine into a bottle with pins to 'stop the urine' of the witch. (23) Although this clearly describes the placing of urine into the bottles, examinations of the bottles are not always conclusive. Most of those tested have reacted positively for phosphates and carbonate, (24) an indicator of the presence of urine, but further examination has sometimes proved that these substances occurred in the bottle through the presence of other matter. (25) Some examples have a felt heart shaped piece of material within them which has been stuck with pins. (26) A common feature is that many of the pins have been bent before being placed into the bottle.

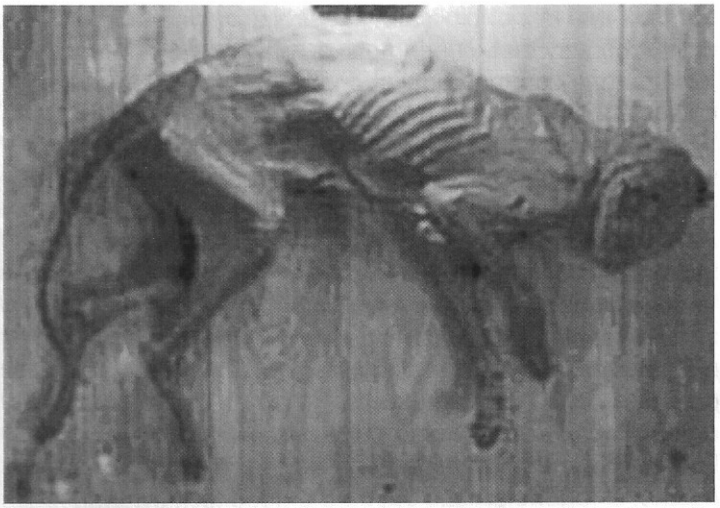
The aim of these bottles seems to have been, once again, to serve as a spirit trap. The placing of the bottles at doorways and chimneys seems to affirm this. (27) Other interesting facts are that the bending of the pins ritually 'kills' them which means they exist in the 'otherworld' where the witch travels - which is why you can't see them. The urine is a way of making the bottle 'contain' the person again in a similar way as worn shoes contain the person. Sticking pins into a heart soaked with your urine would seem to be a way of fooling the witch into thinking that your heart is in the bottle, so when the witch detects you they plunge into the bottle to grab your heart and get stuck inside it and impaled on the prickly pins. One bottle has been found on a parish boundary, suggesting perhaps the fear in one village of a witch in the next.

An unusual example of a witch-bottle was found in Wales. It was a pot which was found with the name 'Nanny Roberts' written on the bottom suggesting either black witchcraft against a particular person or the name of the witch-owner - the pot had the bones of a frog and its dried skin which was pierced by some forty pins. (28) Some bottles have been found with certain plant and insect remains and various body hairs. All suggestive of a spell or concoction of some kind. The use of 'bellarmines' as witch-bottles gradually degraded into using ordinary glass bottles, (29) many of which are now coming to light. (30)

Mummified Cats

A not so common find-type is that of mummified cats, although the correct term is 'dried cats'. (31) These are often found concealed in walls but sometimes roofs as well. In some cases the cats have been positioned, indicating that they were already dead at the time of concealment. (32) One sad case is of a kitten which had been pinned down and had its belly cut. There is also a case where a mummified puppy has been found. (33) Sometimes mummified rats are found with the cats, suggesting a symbolic placing of the creatures, possibly to indicate the cat's function on a spiritual plane. Some writers have commented that the likelihood is that cats are placed in such situations to act as vermin scaring devices. (34) This, however, is unlikely because the locations are often in impractical places such as the roof. When cats are found beneath floorboards there is always the possibility that they crawled there to die, but this does not rule out some kind of foundation sacrifice, which is another of the main suggestions. (35)

This idea of foundation sacrifice seems relatively sensible but you still have to ask why? Is it in the honour of some god or goddess for which there is no obvious evidence? A preferable and more reasonable explanation is that it was hoped that some of the qualities attributed to the cat in life would continue in the afterlife. Cats are reputed to be able to see ghosts and spirits easier than humans can (36) and it is possible that it was their job to catch vermin of a more spiritual kind, perhaps the witch's familiar. George Gifford, writing in 1593, complained of witch's familiars running around outside. (37) If he'd had a cat concealed in his walls, a witch-bottle beneath his doorstep and some shoes up his chimney he'd have had less to worry about.



Concealed Horse Skulls

These unusual additions to a house aren't very common in England although there are some examples. They are more numerous in Wales and Ireland. In a small church at Elsdon in Northumberland National Park three horse skulls were found in the small belfry. (38) This indicates that they were placed there to serve a similar function to that of the bells, ie, to ward off evil spirits. As Ecgbert's (Archbishop of York) Pontifical from the eighth century has it, "Wherever this bell sounds, let the power of enemies retire, so also the shadow of phantoms .... .and every spirit of the storm winds". (39) Another horse skull has been discovered during excavation at the deserted medieval village of Yatesbury in Wiltshire. (40) In a pub called the Portway in Herefordshire over forty horse skulls were discovered screwed to the underside of the floor. (41) The explanation given for this was that it improved the sound of the fiddle when it was played. This explanation seems to have been a later folklore, rather than the true explanation of the practice as many locations in which horse skulls have been found do not improve the acoustics at all. (42) Horses, like cats, have been credited with the ability to see ghosts and other evil spirits (43) and as they serve humans in life, perhaps it was expected that they would serve humans in death too.

Other House Protections

Other ways that the house could be protected were by written charms and curses. The Museum of Welsh Life at St. Fagan's, Cardiff has a good collection of these but the National Library of Wales at Aberystwyth has probably the best collection. Charms have been found in England too. A famous one from Dymock in Gloucestershire was found with the name Sarah Ellis scrawled backwards on it. (44) A charm has been found in a roof in Ludlow. (45) These were drawn-up by local cunning-men and wise-women (white witches) to protect the house or barn from evil in a similar way to the other measures mentioned above. It is probable that the more difficult the method of house protection, the more effective was deemed the method.

Therefore written curses and charms are probably at the top of the effectiveness list. They are usually a mixture of Latin phrases taken from pre-Reformation services and astrological symbols. (46) All the charms are similar in terms of this mix of biblical and astrological literature indicating the way that differing philosophies were harnessed towards one common goal in an era of poor literacy and confusion about religion (47) - this is the period that Wessels described as 'pagan-animist'. The Christian God was one of many influences the cunning-man or wise-woman could draw upon to make a charm work. Saints Peter and Paul were the favourites for divination for instance. (48)

Various symbols have been engraved on to wooden beams and sometimes drawn into plaster work on ceilings. The most common of these is the 'daisywheel'. (49) It is a compass-drawn circle with petals within it and it appears on buildings and on furniture within buildings throughout Britain. It appears to have been a general protection against ill-fortune or was deemed a good luck symbol.

There are many different forms of house protection that were used, these are just the most important ones. During the course of my PhD I have come across many regional variations and many rather intricate and bizarre methods of warding off the evil of the 'black' witch. In all of them there is the implicit belief that the witch can travel through the air and that they can be easily confused by dead-ends or complex patterns. The belief that witches could fly seems to have been shared by all sectors of the population at different times judging by the high status houses which have yielded 'protections' such as these. This could be evidence of a very old cultural belief in the out-of-body experience similar to that which the Friulian benandanti of Northern Italy believed. (50) More research is ongoing to discover more about the many ways that people protected their homes against the 'evil' witch.

BRIAN HOGGARD

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24. The first study to do this methodically was, Smedley, Owles and Paulsen, 'More Suffolk Witch-Bottles', Proceedings of the Suffolk Institute of Archaeology, vol

XXX, 1964-66.
25. A great study of the contents of a witch-bottle found in Reigate has recently been undertaken by Dr Allan Massey of Loughborough University Chemistry Department. His study demonstrated that urine had not been present in the bottle.
26. Merrifield, 'The Use of. . .', op cit.
27. Numerous examples from around Britain reaffirm the manner of concealment but Norfolk Archaeology Service holds the greatest number. Their sample alone affirms that these are the most usual places to find them.
28. Gruffydd, Eirlys, 'A Buckley Pot Used In Witchcraft', Buckley, 6, 1981, p42.
29. The paper by Holmes, op cit, is the only one to properly deal with this devolution.
30. Many witch-bottles of plain glass type have been recorded on my find database, most recently one was discovered in an ingle-nook fireplace in a cottage in Herefordshire.
31. Sheehan, John, 'A Seventeenth Century Dried Cat from Ennis Friary, Co. Clare', North Munster Antiquarian Journal, vol XXXII, 1990, pp64-69. This is the most authoritative and up-to-date survey of 'dried cats' in general as well as the site specific study.
32. Howard, Margaret M, 'Dried Cats', Man, no 252, Nov 1951, pp149-151.
33. Kittens are fairly rare finds but I have at least two on my database - there is only one puppy - there is also a mummified starling, found with a cat and rat - one place has a hare.
34. Howard, op cit, this is the theory that she advocates most of all.
35. Sheehan, op cit, quotes Ó Súilleabháin, S, 'Foundation Sacrifices', Journal of the Royal Society of Antiquaries of Ireland, 75, pp45-52.
36. See, for example, Oldfield-Howey, M, The Cat in Magic, 1993 edition, Bracken Books, London and another excellent source is Opie and Tatum (eds), A Dictionary of Superstitions, 1989, OUP.
37. Haining, op cit, pp76-110.
38. The Story of Reelesdale, 1986, published by the National Park.
39. Quoted in Robbins, op cit, p512.
40. This is another find on my database, soon to be written-up.
41. Merrifield, The Archaeology. . ., p123..
42. Ó Súilleabháin, op cit, this article was a survey of people who knew of examples of horse skulls and the local explanation for how they got there.
43. Again, see Opie and Tatem (eds), op cit.
44. Chris Morris, Gloucestershire Folk Lore, 1988, Gloucester Folk Museum, p4.
45. I have details of this and many others on my database.
46. Duffy, op cit, Thomas, op cit, and Merrifield, op cit, have demonstrated this.
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48. Thomas, op cit, in particular is good for this subject.
49. For more information from the pioneer of this subject see, Easton Timothy, 'Ritual Marks on Historic Timber', Weald and Downland Open Air Museum Magazine, Spring 1999, pp22-30.
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This bellarmine witch-bottle was discovered beneath the hearth in an old cottage in Felmersham, Bedfordshire in late 2001. After being x-rayed, photographed and examined it was found to contain hair, pins, and it tested positively for urine. The expert who analyses the contents of the bottle is Dr Alan Massey, who would welcome any communication regarding his work.

There are well over a hundred dried, or mummified, cats on record at present - although there are anecdotal records for probably over ten times that amount. The most common places to find these poor creatures is in walls, under floors and sometimes in roof spaces.

There are, of course, examples where it is difficult to tell if the animal was purposely concealed or whether it merely crawled away to die. A sad case is from Worcester where a mummified cat and kittens were found below floorboards at the Reindeer Inn (now part of a shopping arcade). It seems likely, though not certain, that the cat had crawled into a cavity to give birth and had become trapped with her kittens and slowly died. However, when a cat is found concealed in a lath and plaster wall, or bricked into a cavity then it is usually somewhat easier to find out whether it was put there with intent.

FOSSILS IN A NUT SHELL

Ever wonder exactly what a fossil is or where they came from? Fossils are actually the remains of plants or animals that lived millions of years ago. While that is what they are, fossils still to this day serve a very important purpose. They are able to provide some very important information about what life was like millions of years ago. A YouTube video blog from the past, you might say. Only not so annoying.

A fossil is a long time in the making. Millions of years actually. A very gradual process. It all begins when a creature dies, or a plant drops into some sediment. Usually, this sediment is at the bottom of a lake, river or stream. Sediment is made of mud and sand. Over time, with the pressure of the water, the sediment eventually turns into rock. The water provides not only pressure, but minerals also. Those minerals seep their way into the remains of the creature or plant and begin to dissolve. As they dissolve, they crystallize, and begin the transformation from skeleton to fossil. Depending on the types of minerals in the water, the fossil can form in two separate ways. Some minerals completely dissolve, and leave an empty space as a fossil. Kind of like carving a shape into a rock by removing portions of the rock. Some minerals actually

harden though, and take over the space left by the dissolved remains of the creature. Other items to turn up in fossils, include eggs, dinosaur droppings, and footprints left in the some mud by many forms of creatures. Even trails formed by worms and other burrowing insects through soft mud has survived through the centuries to become fossils. Just imagine the kinds of things everyone of us can do to the planet that may one day turn up as fossils for future archaeologists.

You may wonder how it is that you find so many fossils on land when the majority of them were formed under the water. Well, as the earth continues to reshape itself, lots of things get pushed around. Plates within the earth shift, volcanoes explode, and typhoons and tsunamis move massive amounts of water and land. Over time many things that were buried under water, are moved by the natural forces of the planet to somewhere else. Like your own backyard for example. So, keep your eyes open, you never know what you may find.

CHRIS CAMPBELL

AGAMEMNON DOESN'T LIVE HERE ANYMORE

The future of "Archaeological" tourism is beginning to cause many problems for special sites, and Mycaenae must come very high on the list. How these problems are solved may produce a different set of problems! I first visited it in 1972 when one was free to wander everywhere on the site. It was wonderful - rough stones, ancient steps, very few prohibited areas, and how could one not believe in Homer when you could stand under the Lion Gate?

Mycenae Ariel View

I have been back several times over the years because it is a powerfully fascinating place, but my last visit was probably 4 years ago. In October I went again. It was a mistake. I was with a small group who were involved in making a film on the "Glories of Classical Greece" for publicity purposes, so we walked up the ancient stone ramp of rough cobbles, but had to stop by the Lion Gate while the cameraman waited for the right moment. Several coach loads of students and others duly marched past us. I began to idly wonder why no one came back in the other direction. It would shortly become clear!

After the gate it was no longer allowed to walk round the Grave Circle where Schlieman found all the wonderful gold masks and jewellery, but you could look down on it from the stone ramp. The famous Megaron or King's audience room was also fenced off, and then it became obvious why the traffic was one way. In front of you there were now shining white concrete steps which led on to a white ribbon of concrete path which led you through the site. It was possible to step off the path but it was laid about 6 inches higher above the basic surface. You could follow this path to the postern gate at the back of the site, and then back along the outer wall to the new Museum and back to the entrance.

Unlike the Romans, the Greeks did not have concrete. The path is a totally alien intrusion into a Historic site, and it is hard to describe the loss its presence causes.
I am truly sorry for those of you who may not yet have been to Mycaenae because you can never now know it as I have done - but it has a very nice new Museum [even if most of the exhibits are replicas!]

ANNI INDUNI

THE WEALDEN IRON RESEARCH GROUP ONLINE SITES DATABASE

The iron industry in the Weald has been extensively studied since the mid 19th century, with writers, from Mark Antony Lower to Henry Cleere & David Crossley, compiling gazetteers of sites where iron-making took place in the Weald. To date, more than 800 sites, dating from the pre-Roman Iron Age to the 19th century AD, have been discovered and new ones are found every year. As well as their intrinsic importance as evidence of the growth and development of the iron industry, the existence of sites in a parish contributes to the economic and social history of those localities. With the regular discovery of new sites, printed studies rapidly fall out of date, so the Wealden Iron Research Group determined that an online database of sites, that could be regularly updated, would be a useful tool for historians, archaeologists and others. Adapted from an Access database compiled over the past 20 years, and incorporating site information originally published in The Iron Industry of the Weald in the group's own journal, Wealden Iron, and in other sources, the opportunity has been taken to allow a wide range of fields to be searched, and bibliographic sources to be included. This latter feature will be extended in due course to become a more general bibliography of the iron industry. Other features, including images, may be incorporated in due course. Search facilities are available to any user, without pass-

word, editorial access being reserved for the managers of the database. Corrections, amendments, and information about newly discovered sites are actively encouraged, and the Editor will be pleased to hear from any would-be contributors.

JEREMY HODGKINSON

The database can be accessed from the Wealden Iron Research Group's website: www.wealdeniron.org.uk.

ROMAN IMPERIAL COINAGE
What were the coins?

The diagram this page shows the main denominations during the 1st and 2nd centuries AD. In addition to the pieces shown, there were also quinari, in both gold and silver, each representing half the value of the equivalent metal coin.

However you should not think that there was no change in the coinage of the 1st and 2nd centuries. At the time of Augustus the coins were almost pure metal, however, successive Emperors (who were always strapped for cash!) lowered the weight and fineness of their coinage so that by the time of Caracalla (AD 198-217) the denarius was barely 40% silver. Indeed, Caracalla introduced a new coin, the antoninianus, valued at 2 denarii but with the weight of 1.5. By the middle of the third century, the Antoninianus had driven the denarius out of circulation, and the previous bronze coinage becomes rarer and rarer. At the same time, the antoninianus became more and more debased, until by the reign of Gallienus (AD 253-68) it was little more than a copper/bronze coin with a slight silver wash.

Diocletian (AD 284-305) radically reformed the coinage, introducing two new units, the silver argentius and bronze follis to replace all previous coins. Constantine I (the Great, AD 307-337) continued the reforms with the introduction of the gold solidusa, the silver miliarense (16 to the solidus) and the silver siliqua (24 to the solidus). The bronze follis declined in size, being replaced by a series of bronze units now referred to as AE1, AE2, AE3 and AE4. The difference between these is size, the smallest AE4 having a diameter of 15mm. Constantius II and Constans (AD337-350) introduced a bronze piece, the centenionalis, but this quickly became indistinguishable from the previous issues.

What did they look like?

The obverse of the coins nearly always show the Emperor in whose reign they were struck, although wives, sons, daughters, mothers and fathers may also be shown. The portrait is nearly always in profile, and the style changed with time. The reverse can show a bewildering variety of images, including deities, conquests & victories, geographical or architectural features, animals, heavenly bodies, inscriptions, mythology, symbols etc. It must be remembered that nearly all of this was propagandist, trying to show the Emperor in as good as light as possible. Coins became a communications channel between the Government and the people, to mark important victories or food handouts, to show who was Emperor and what he looked like, and to rally support. The political turmoil of the third century produced coin reverses proclaiming 'Happiness of the Age' and 'Peace Everywhere' when this was anything but the reality with peace and prosperity were slipping away. In the absence of a mass media, coins were used to transmit news of major events, to instill the need for piety for the gods and reverence for the Emperor.

Roman Coinage of the 1st and 2nd centuries AD

Aureus gold	Denarius silver	Sestertius orichalcum	Dupondius orichalcum	As copper	Semis orichalcum	Quadrans copper
1	25	100	200	400	800	1600
	1	4	8	16	32	64
		1	2	4	8	16
			1	2	4	8
				1	2	4
					1	2

Aureus of Hadrian

Denarius of Augustus

As of Antoninus Pius

Semi of Trajan

Quadrans of Claudius

Sestertius of Trajan

Dupondius of Nero

From the middle of the 3rd century onwards, most reverses also show a mintmark recording where they were minted. As an example the letters I, ML, MLL, MLN, MSL, PLN, PLON, AVG, AVGGOB & AVGPS all indicate that the coin was minted at Londinium (London).

What were they worth?

We can not, of course, apply our modern monetary values to any ancient system, the economic systems and consumer goods available being so very different. In addition, study of exchange rates will show that any values we assign today will be dated tomorrow. However, we do have the evidence from classical authors and graffiti from some sites. Thus we know that in the 1st century AD the pay for a legionary was 4 aurei per year.
Finds at Pompeii have given us a lot of detail about costs in the 1st century AD, of which the following are only a short example:

Slave = 100 denarii 24 sestertius
Silver sieve = 90 denarii
Mule = 5 denarii 2 sestertius
Tunis = 15 sestertius
Stewing pot = 1 as
Measure of wine = 1 as

How representative are the finds we have?

It is actually quite surprising how many Roman coins have been found in Britain. As an example, excavations at Richborough have recovered 51567 (dating from pre-invasion to AD 402) coins by 1991. Whilst this is a huge number, we need to be aware that it represents only a small fraction of the coins that must have been in circulation.
The site of Corstopitum (modern Corbridge in Northumberland) was important in the 1st century as a fort later becoming a significant civil centre. Excavations to date have recovered 1387 coins from the 1st and 2nd centuries AD, which together have a face value of 23 aurei. If we assume that the fort was occupied for 150 years (from AD 50-200) by a cohort (500) of legionaries, who were paid 4 aurei per year, then the total pay for the troops in the period under consideration was 300000 aurei. The archaeological record contains 23 aurei, just 0.0086% of the total. This maths is just a bit of nonsense really; there are so many dubious assumptions involved as to invalid it statistically. However, it does serve to illustrate that coins are no better represented in the archaeological record than any other artefact.

What use are they to the archaeologist?

Coins provide us with an invaluable historic record of the comings and goings of Emperors, indeed one Emperor, Domitianus (probably a usurper in Gaul) is known from one coin only, there is no other evidence for him in the written record. In addition the reverses can tell us a lot about military campaigns and victories, and record images of what some features may have looked like. As an example a relatively common reverse is a quadriga, a four-horse chariot. These images have allowed archaeologists to reassemble fragments a quadriga statuary from triumphal arches.

An obvious use is as dating tools, though it should be remembered that they only provide us with a terminus post quem, a time after which the coin was minted. It must be remembered that the coins circulation life could be a very long time, just like Britains pre-decimal currency. The Antonine Wall was occupied between c.140 and c.165 AD. However most of the coinage recovered from the site is pre Antonius Pius, who came to power in AD 138.

If we make a few basic assumptions, such as: (I) the loss of coin from the original population is constant with time, and (ii) we have recovered a representative sample of those coin losses, then we can process the data to make valid comparisons between sites. The most common method used is:

$$\frac{\text{Coins per period}}{\text{Length of period}} \times \frac{1000}{\text{total for site}}$$

Two examples are illustrated* plotted using the same scale on the Y-axis, though this is not necessary if you are looking for patterns. In this case we can see that the two sites, Calleva (Silchester) and Corstopitum, show remarkably similar histograms, with peaks occurring during periods 18 (AD 260-273), 23 (AD 330-348) and 25 (AD 364-378). In fact, this pattern is common through much of the British Isles, and suggests that the coins reflect general features of the economy at the time. This can be identified and then interpreted. As an example, during period 18, the high rate of coin lose reflects the collapse of the imperial currency system due to rapid inflation, requiring many more coins in circulation and thus devaluing those coins. This in turn reflects the intense political turmoil of the times, with the western part of the empire under the rule of usurpers.

PETER BRANNLUND

*Editors note: Unfortunately we were unable to reproduce some of the illustrations accompanying this article.

WHY EXCAVATE AT ALL?

Matthew Walker discusses whether advances in archaeological surface survey techniques have made the need for excavation redundant.
Most people assume that excavation is the archaeologist's main concern. Most people are wrong. Today, excavation is probably what archaeologists do the least. That is not to say that the criticality of excavation has diminished within Archaeology. It is just that operational difficulties with excavation, changes in approaches within Archaeology and advancement in technology such as improved surface survey techniques make excavation less extensively required. Yet when it is used excavation is much more intensively employed.

Originally excavation, whether unplanned, in the form of grave robbing or curiosity, or planned, in the form of a structured approach was the main way in which evidence, knowledge and understanding could be acquired. Where excavation is most often employed today is in rescue archaeology. Here, archaeologists are given a very limited amount of time to examine and rescue artefacts prior to some other construction programme, coastal erosion or perhaps a road building programme. This is due largely to the legal or planning framework and the fact that the developer more often has to pay for the work.

This essay seeks to review how changes not only in surface survey techniques but other pressures have changed the way excavation is used in archaeology today. This essay sets out to describe current concerns with excavation, analyse the modern approach to archaeology, discusses a wide range of alternative 'surface' exploration techniques, explores the limitations of each approach and concludes by placing excavation in the context of a 21st century approach to archaeology. It is essential to place the role of excavation within context of a broader analytical process because excavation is just another tool in the archaeological kitbag. The issues are, why it has to be used and what is it used for?

What's wrong with excavating?

Excavation has served archaeology well and it is the public's perception of the role of archaeology. Yet there are problems with excavation as an approach. It is after all a very destructive process. More often than not it ends up destroying part of the very evidence that needs to be examined. It is also immensely expensive. Despite volunteers excavation is highly labour intensive and therefore expensive in terms of costs such as labour, equipment, travel, measuring and monitoring equipment and accommodation. And moreover it can be very time consuming. Many sites have excavation programmes that run over decades. And for some, excavation can have legal issues in terms of access to the site, time spent on the site and ways of working. There are also examples where permission has been denied due to religious influence, such as in Japan. The excavation of burial or culturally important sites is fraught with access issues. So excavation is not without it's difficulties. And despite advancements in new surface techniques, which are described later, the role of excavation within the research process was inevitably going to decline if only due to financial, environmental and cultural pressures.

Changes in approaches within Archaeology.

What is less well understood by the general public is that there have been a number of trends which have further contributed to the diminishment of excavation as an activity. As Bahn puts it "there have been two major trends over time; first, excavation has become far slower and more painstaking.... The work is incredibly meticulous... Secondly, we are acquiring vastly increased quantities of materials and we can learn far more from what we have (1)." The conclusions to be drawn from this would appear to be contradictory. Whilst excavation is getting more expensive and thereby more difficult to undertake we are now able to do more analysis with less sampling.

As technology improves we are able to undertake a wide variety of analysis from microscopic, radio carbon dating or even DNA samples. The ability to determine more, from fewer samples again suggests that less excavation is required. Moreover, more often than not the balance of effort now rests with the specialist analysers such as pollen experts and dating analysis rather than the excavators. So, again some of the requirements for extensive excavation have diminished through the advancement of other analytical techniques and not just surface survey techniques. Simply put it would appear we don't need to do as much excavation as we used to get the same results.

Furthermore, Archaeology itself has changed in a number of ways. No longer is the emphasis simply upon the acquisition of material culture or artefacts. In many cases, we have a reasonable understanding of the surviving material culture. Indeed, Bahn quotes examples in Egypt and Italy where items are reburied in the ground simply because the museums are too full, theft may be ripe, preservation difficult and documentation slow. In many cases further excavation would add little to our understanding and preservation in situ is the best option. So once again we can see the need for excavation as a means of acquiring material culture is declining.

Archaeology has changed in other ways. The emergence of processual archaeology under Binford and others again moved archaeology towards broader concepts of explanation, process, deduction, hypothesis testing, question setting and response. Answering questions about the organisation of societies, the environment, and the trading contacts employed, their thought processes and their diet have a much greater importance today. And answering these how and why questions implies a much broader scope of work. Excavation alone cannot answer all these questions. So for both theoretical reasons and practical reasons described above the acquisition of material culture through excavation is no longer the main driving force. This again reduces the reliance upon excavation as a primary analytical tool.

Given such a broad approach Archaeology needs a structured research process. This procedure is described by Renfrew and Bahn as research design. Research design has four components, namely; formulation, the collection and recording, processing and analysis and publication. For example, more detailed work in the formulation part can focus lines of enquiry into a specific area and thereby again reduce the amount of excavation required. As we have already mentioned more meticulous collection and recording can reduce the requirement to excavate and indeed revisiting and reinterpreting original notes can prove highly instructive. Again this reduces the requirement for extensive excavation.

As the questions currently posed by Archaeologists tend to be more 'strategic' the focus of the field work is also of a strategic nature. Overall landscapes, context, trading patterns and systems are more important than individual sites. As such this requires different techniques. As Greene states "field work today is rarely directed at a single site. It usually forms part of a comprehensive study of an area". He continues " studies are designed to elucidate the broad agricultural, economic, and social developments" (2). As Renfrew and Bahn surmise "Today archaeologists study

whole regions". They continue "the focus has broadened to take in whole landscapes and a surface survey at sites in addition to - or instead of - excavation (3)." So once more the reliance upon excavation as a primary tool is diminished.

The role of surface survey techniques

All these changes in cost, approach and technology have led to or perhaps been partially caused by a new set of archaeological tools. These tools need to be overlaid within the archaeological process. Sites can be discovered through a variety of means. These might include research on word of mouth, family history, and original research, local history, place names, records of activity; register of sites and even by accident. Most often sites are known about and identified through research sources and checked by a surface visit.

Aerial photography

Once located site analysis begins through some form of ground, or surface reconnaissance. At the strategic level aerial and satellite photography and analysis is useful. Photographs have two purposes. Vertical views can provide a quick overview or mapping capability which is important for context. More sophisticated images from specialised films such as infrared, radar mapping and radiation signals can provide insights into structures and spatial networks. Photographs taken from the correct oblique angle and with the right light can highlight shadows, crop marks, buildings, tracks and other infrastructure often imperceptible or confusing on the ground. The availability of declassified photographs, the relative ease of obtaining such items and their power for analysis makes aerial study very attractive. As such aerial photography is considered one of the most important archaeological developments in the 20th century and has contributed to a number of new finds and lines of enquiry. And given archaeology's requirement for context, aerial photographs provide a very valuable asset.

However photographs don't provide all the answers. For example it is difficult to tell elevation, age, scale, purpose, sequence and most fundamentally it only records that which is physically visible on the surface. So we may have a good visual record of the last occupation but what of previous ones. Aerial photography needs to be assisted by other techniques.

The role of field walking.

The classic surface survey technique is field walking. Field walking can be random and or sample based but invariably has some form of structure such as transects to facilitate recording. This approach can cover large areas which is useful in "regional" analysis and where evidence is likely to be more scattered due to migratory or hunter gather type activity. Field work of this type is proving immensely useful in providing the broader context and is very cost effective. Issues remain in the ability of individuals who have varying capacity to identify objects, the impact of the natural environment on material culture and the walking resources required. As Renfrew and Bahn comment "now that surface survey has become not merely a preliminary to excavation but in some instances a substitute for it … a vigorous debate is taking place....about how far surface traces do in fact reflect distributions below ground. They continue "the relationship between surface and subsurface is undoubtedly complex ands varies from site to site and it is therefore wise to determine what really is below the ground (4)".

The role of sub-surface exploration.

So how can we best explore below the surface. Whilst the purpose here is to view what is below the surface the work takes place on the surface so it has been included as a surface survey technique. There are many ways to view the sub surface. None evasive approaches can use, echo sounding, electromagnetic magnetic, metal detectors, electrical resitivity, radioactivity, thermograph, geochemical analysis and even dowsing.

Sound waves such as sonar have been used to detect tombs in the Valley of the Kings and thereby avoid unnecessary exploratory excavation. And such techniques have great validity in underwater work. Probes have been employed involving rods and augers at the end of which may be attached lights and cameras. Such techniques have been used successfully by Hurst Thomas in the USA, Lerici in search of Etruscan tombs and work on the Pyramids.

Ground based radar can be used. This radar not only detects variation in the composition of the soil which might indicate filled ditches or graves but can also indicate the depth at which variation occurs. We can therefore generate three dimensional maps and time slice the soil. This can help show how many possible layers of settlement there have been. This can be hugely useful in pinpointing where to excavate or indeed whether there is any thing to excavate.

Two other techniques for non evasive surveys are use of a magnetometer and resitivity. A Magnetometer measures the magnetic properties of the soil and highlights where iron oxide concentrates are higher. Magnetometers are good for cut features and work best in pre-historic sites and were used successfully in analysing the route of the M3 motorway. By identifying the locations of postholes, for example, they can help survey and direct subsequent excavation. Generally they are an efficient way but care needs to be taken with external influences such as power lines.

Resitivity measures electrical resistance and is based on the relative electrical conduction capability of various materials. The principle benefit being that the damper the soil the less resistance it will show to an electrical current. As Renfrew and Bahn comment "this technique works particularly well for, ditches and pits in chalk and gravel"(5). It is then possible to map subsurface features without any form of excavation. The technique can be slow and is best used when ditches and pits are being sought as opposed to walls. Thus it is very useful in pre-historic and not so in Roman and beyond. Again resitivity can help pinpoint areas for excavation.

Geophysics helps with detailing and focusing of subsequent work. But clearly it usually requires that a hypothesis is being tested as each technique has its own advantages and disadvantages. The appropriate use of the right geophysics tool can substantially aid an excavation strategy.

The role of Geographical Information. Systems and docu-

mentation.
Moreover raw material requires interpretation. This requires human skill and computer speed. Integrating interpretation with Graphical Information Systems represents a huge advance in presentation and "what if" modelling. With GIS physical, human and natural activity can be overlaid on the environment. Patterns can be established and resource requirements calculated. This helps to answer the how's and the whys of modern archaeology and again helps focus any follow up excavation work.
There is a realisation today that part of archaeology's role is to ensure that good records and documentation is kept. This leads to robust project control processes both during the overall project and particularly during excavation. This realisation is based upon the fact that we may never be able to truly explain the past but by leaving good records of our work they are available for subsequent reinterpretation. Again as most archaeology is public funded and requires reporting and presentations the resources available for extensive excavation is again reduced. Chapman's work at Gatas is evidence of this where sizeable progress reports are required to renew permits for the following year (6).
How is excavation used in practice?
So far we have commented up the pros and cons of a variety of survey techniques. We have stated that excavation has difficulties due to cost, time and access. Moreover these operational difficulties are compounded by the capability of other techniques to contribute much to the research process. From aerial photography to sub surface radar much can be understood without resort to excavation. A case study on the Roman town of Wroxeter quoted by Renfew and Bahn uses all these techniques (7). But only 1% of the nearly 200 acre site has been excavated.
So why do we still excavate?
Yet excavation has its advantages. "Digging" as Greene suggests "still delivers an unmatched quality of evidence" (8). It is only through excavation that hypotheses can be tested. Moreover in response to concerns we have seen changes in the way excavation is carried out. We have seen a change in excavation techniques that reflect changes in thought. Originally most excavation was brutal and vertical. More lately increasing excavation costs and disruption concerns encouraged keyhole excavation. And today in keeping with the new approach we are seeing the increased use of area or horizontal excavation in order to provide context.
In some cases excavation is the only way we can acquire the detailed evidence of smaller objects of material culture and read the story being told by the stratigraphy. Accurate dating can be acquired and sequencing through analysis. Excavation is the only way to acquire ephemeral and environmental evidence. Excavation also helps with chronological analysis by helping to identify changes in use over time and distinguishing between different layers of development. At the Gatas site it was only excavation that helps separate pre-historic buildings from much later Arabic ones. Excavation provides vertical and horizontal analysis that may otherwise over looked. So excavation is good and in many ways the final technique to turn to.
Greene concludes "proper research programmes are less exciting and more expensive than unplanned exploration, but their results allow much firmer conclusions to be reached about site distributions, settlement patterns and other features of the ancient landscape. Our ability to investigate ancient landscapes and environments, without resorting to the destructive process of digging into sites, means that no excavation work should be carried out until a programme of field work and documentary research has been completed. It is impossible to ask valid questions about an individual site without understanding its place in the historical and natural environment". (10)
Renfrew and Bahn agree "until the present century, individual sites were the main focus of archaeological attention and the only remote sensing devices were a pair of eyes and a stick. The developments of aerial photography and reconnaissance techniques have shown archaeologists that the entire landscape is of interest, while geophysical and geo-chemical methods have revolutionised our ability to detect what lies hidden beneath the soil. Excavation should be the last resort as it involves irreversible physical intervention" (11). But it may ultimately be the best technique the archaeologist currently has.

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WOAD

Woad (Isatis tinctoria)
BRASSICACEAE, Mustard Family
Indigo (Indigofera tinctoria)
FABACEAE, Legume Family
Some time ago there was a debate about the dye woad, and its origins, and its production over the centuries, woad is a very old type of dye, used all over the world over the centuries, it was the most used of all the blue dyes for its intense colour, the use of woad nowadays has almost died out, except for a very few people who make their own.
RODNEY GUNNER

The history of woad.
Among the tales told about vegetable dyes, those spun about the Old World blue dyes, woad and indigo, are the most intriguing. Woad (Isatis tinctoria) was a native of southeastern Europe, presumably either around Greece and Italy or southwestern Russia, and spread quickly

throughout Europe in prehistoric times. This plant became the dominant blue dye in Europe, especially in western Europe. Indigo (Indigofera tinctoria), on the other hand, was a native of southern Asia and provided the blue fabric pigments for Asia. In North America, certain Indian tribes, and most notably the Navajo, used blue legume dyes from species closely related to indigo.

Woad is a temperate herbaceous biennial, which produces a basal rosette of leaves during the first year and a single stem that eventually bears yellow flowers the second year. The leaves on the erect stem are lance-shaped and have no petiole. In some parts of the world, this species is a noxious weed, and it is rarely cultivated any more, although woad can be grown easily in temperate gardens. The dye of woad is no longer manufactured on a commercial basis, but there are accounts of the process. In olden times, the leaves were picked by hand, crushed with wooden rollers, and then hand-kneaded into 3-inch-diameter balls. This kneading gave the workers blackened hands. Afterwards, woad balls were dried on trays and stored until needed; eventually the balls were ground into a powder by rollers and piled into deep layers in special "couching houses." The layers were watered and allowed to ferment; there had to be a breakdown of indican, a sugar-bearing molecule, to the dyestuff indigotine (analogous to vanillin production). Fermentation of these leaves produced horribly foul odours, probably because woad has sulfur-containing chemicals in the leaves. (Queen Elizabeth I decreed that no woad processing would be allowed within five miles of her residences.) After two weeks of fermentation, the leaves were dried; this powder contained indigotine. Commercial production of woad ceased after the 1932 woad crop was processed in Lincolnshire, England (Skirlbeck Mill).

Nowadays spinners and weavers can make their own woad, if they are patient. One uses the young leaves; in fact, the old leaves turn blue, but this stage is too late to harvest the chemical for dyeing. For dyeing, fresh leaves are put into a jar and covered with almost boiling water. The jar is covered to exclude all air. In a while the liquid becomes coloured and produces small bubbles. Alkali is added to the coloured liquid, and then the solution is shaken until it becomes greenish. Woad is a tricky dye to get correct, and many do not have success even following the detailed recipes that exist. Some type of green liquid is the form of the solution for dyeing. The fabric is dyed greenish-yellow but turns blue when exposed to the air (air oxidation) and becomes relatively fast when put in an acid and then a soapy rinse.

Indigo (Indigofera means "indigo-bearing") is a subtropical shrub 1 to 2 meters tall that possesses the woad pigment in the leaves. Leaves are crushed and then soaked in water for fermentation (removal of the sugar). As in woad dyeing, the solution used in indigo dyeing is yellowish-green.

Woad was the dye that was used for many centuries in the British Isles; in fact, early inhabitants used it as a blue body dye to frighten opponents, and the Roman soldiers referred to these people as Picts, which is Celtic for "painted." Since Roman times, woad became extensively cultivated in northwestern Europe and was a major industry and trade item. In England the colour Saxon green for Robin Hood and his men was obtained by first dyeing in woad and then in a yellow plant dye called wild mignonette (Reseda luteola, Family Resedaceae). Trade in woad was so important in western Europe that production was controlled by the mid-1200s.

Indigo held the same important status in Asia, where indigo plants were being used 5000 years ago. Production and trade of indigo was controlled by India. It is not surprising, therefore, that trouble would "ferment" when merchants tried to introduce indigo to Europe. Numerous fears and anxieties were given to woad growers about indigo by the woad merchants, who called it "devil food" and a bad drug, but who actually feared the indigo competition. A union was formed, called the Woadites, which was an international political group of woad producers, united to fight indigo. Laws were passed in England, France, and Germany to prohibit the importation of indigo. In the 16th century, indigo was brought to Europe by Dutch, Portuguese, and English traders from India. Slowly but gradually, indigo replaced woad as the preferred dye in western Europe, even though the pigment used in both was the same. Obstacles to indigo trade were dropped by the British when they occupied India and began the exploitative activities of the East India Company.

In 1649 Europeans also attempted to break the Indian monopoly on indigo by planting this species in the New World. The first crop of indigo in the New World was produced by Eliza Lucas Pinckney in South Carolina (1740s), but there indigo was passed over in favor of rice (Oryza) cultivation during the Revolutionary War.

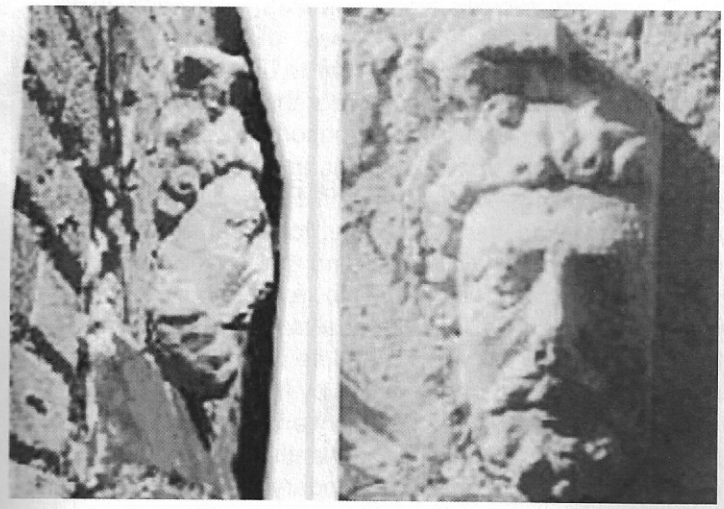
World consumption of indigo in the 1800s was very large indeed, so in 1866 a German chemist named Adolph von Baeyer began his studies of the pigment and eventually elucidated its chemical structure so that it could be synthesized commercially. At the end of the 19th century, Germany was able to produce synthetic indigotine cheaper than the natural dyestuff, and thus Germany then took charge of supplying indigo. Some competition developed when an indigo factory was built at Ellesmere Port in England (1916). Hence, with supplies from India, the Far East, and Africa, as well as synthetic indigo and other blue substitutes, the blue plant dye industry lost steam and has been on the decline ever since.

Indigo is not a preferred fabric pigment in modern societies--it does bleed and fade with age, although the faded look is now one of its pleasing qualities. Indigo is a dye that can colour cotton from a cold dyebath and still give fairly good colour fastness. There are no synthetic dyes that have the identical colour and physical characteristics of indigo and indigotine.

UCLA, PROFESSOR ARTHUR C. GIBSON

A FACE ON A WALL

The full parameters of archaeology are wide and diverse and so it was with some hesitancy that during the summer excavation at Blacksmiths corner I was taken on an expedition to darkest Binstead by the intrepid Rodney Gunner to visit "the face on the wall"



ROMAN HEAD PHOTO

First was the trip preparation that entailed clearing the front seat of the car of accumulated rubbish and detritus of several archaeological digs. The floor was strewn with sweet wrappers, plastic bags, sandwich cartons (all low calorie products) and strangely several pieces of Samian pottery. The clearing consisted of moving most of the larger items on to the back seat but soon we were off. Right at the main road, passed Walberton, right again, another right and passed the pub (surely a first for Rodney that demonstrates the excitement of the moment). If we had turned right again we would have come back to where we started. Why didn't we turn left at the start? Well one never questions the instruction or the direction finding ability of the expedition leader.

Then the long trek south from the pub. The road became narrower and narrower and the hedge rows higher and higher until finally we passed a dead end sign. Tucked in behind a vast hedge was a tiny lane and to the right a front door of a two story cottage. To one side a large rose bush grew to about 7 feet tall and parting the uppermost branches Rodney revealed "the face".

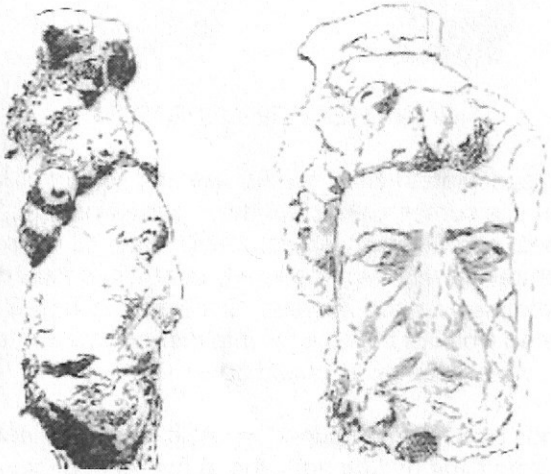
How he ever found it remains a mystery but there it was set into the middle of a blank wall. The life size protruding face has curly hair, a beard and moustache and staring eyes. Made of limestone the head has seen the ravages of time and weather but the left hand side of the face has been cut off so the hair, ear and part of the cheek are missing. The hair is surmounted by a small flat plinth showing that this was once part of a bigger structure.

The nose and the top lip are heavily eroded and parts of the beard are missing and as the head is part of the wall it is impossible to tell if the head was once complete.

The face is quite imposing and when made was of high quality. With the local history of Roman occupation and the lack of building material on the nearby Roman villa it is possible that this head was pillaged from the Roman site when the cottage was built and incorporated into the wall. The building has very little of its original structure left but could be 12th to 14th Century construction. Only the east wall and a part of the south wall could be original as it is built with a mixture of brick and limestone blocks and rubble. It has been refurbished with Tudor bricks above the existing window and door and a side support buttress has been added at a later date.

With the presence of metal tie bars it is envisaged that at one time most of the structure was demolished and a rebuild incorporated part of the original structure. The rest of the property has many refurbishments including a modern kitchen extension to the west.

Very little of the first structure remains but the limestone blocks inserted in the wall are of the same colour of material as the head presuming they came from the same source.



ROMAN HEAD ROUGH DRAWING

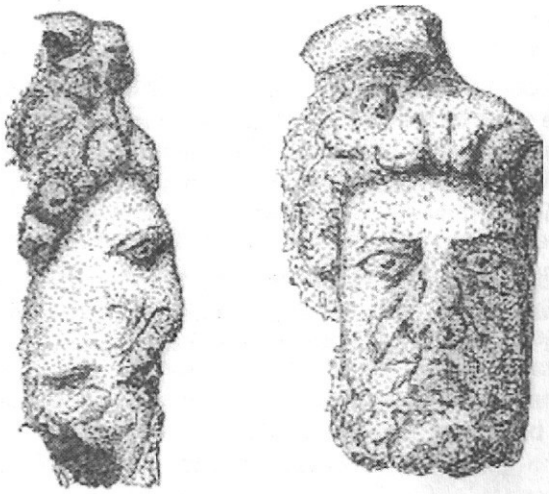
If the head is Roman then who could it be? Several candidates spring to mind led by Jupiter the supreme god of the pantheon. The curly hair and beard and the strong features are definitely meant to be imposing so if we are into naming a deity Jupiter would make sense.

Another candidate could be Neptune god of the sea, the water god who protected the land from drought but my favourite candidate is Silvanus the deity of woodland and uncultivated land. Silvanus was also attributed with the ability to watch over cultivated land and ensure crops were plentiful and the land tended properly.

A discovery of this nature needs to be recorded and step one is the photography carried out by Rodney (web site directions at the end of this article) following this dimen-

sions and detailed notes and then the illustration. Initially it was considered that two views were needed to show all aspects of the head and a preliminary drawing was produced in pencil.

Once the size and positioning of the finished drawing was established it was possible to produce a likeness with Indian ink on permatrace. The head was both photographed and shown in direct sunlight from the upper left to emphasize the carving of the facial details. The surface is heavily pitted but still retains the essence of the original work.



ROMAN HEAD FINAL DRAWING

Now to speculate. I think our Roman first century villa at blacksmiths corner, only a few miles away, was adorned by their local god Silvanus who probable watched over the main entrance. He kept the family safe and ensured the land produced a good harvest. Our Romano British family prospered well but the villa fell into disrepair at the end of the 4th century and was pulled down.

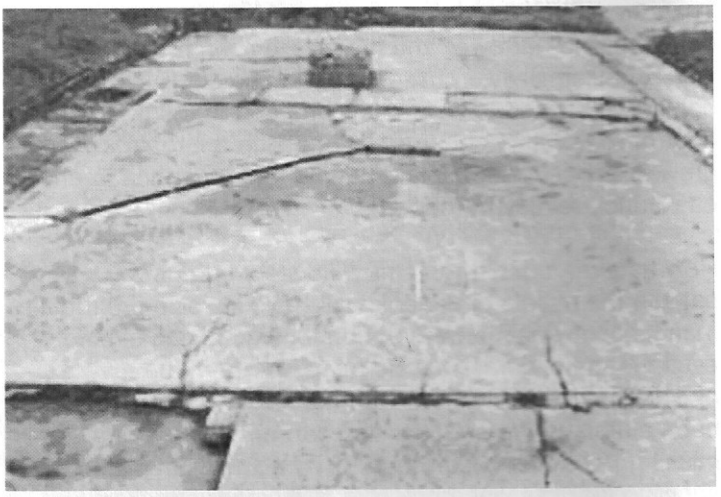
Our gods head lay half buried where it had fallen and it was not until the middle ages that a farmer built his cottage out of what materials he could lay his hands on. He obtained bricks and blocks from all over the local area and discovered some of the original limestone in a ditch. Our head was among the material and so to bring his new house luck he incorporated the head in the wall looking east to watch over his farm.

There is no basis for this but its nice to create a story that possibly could match the reality and it adds a little romance to this enigmatic sculpture. Somehow and somewhere someone found this head and added it to their building. We will never know who or why so lets enjoy a little flight of fancy.

BOB TURNER

NEWHAVEN - BISHOPSTONE TIDEMILLS 2007

The 2007 fieldwork season has all but drawn to a close now and it has been a very busy year on site. The first part of the year was spent finishing off the recording of the original coalyard area. This was meant to be quite simple, but nothing at Tidemills is simple! The extant boundary walls are of a number of different phases – the earliest ones, built of flint beach cobbles, appear to have been the northern and eastern ones which border the footpath and main village street respectively. The reason? To screen the unsightly coalyard from the village and quite probably to prevent the villagers pinching a bit of free coal! The wall on the southern side was added later to screen off the millhouse from the dusty coalyard and that on the western, creek side probably when the slipway was built. And that is just the boundary walls to the coalyard! We found traces of the chalk floor of the yard, complete with trodden coal-dust layer, in the eroded bank section by the creek. In the 1920s the horse-doctor's stables were established in the former coalyard. The U-shaped weather-boarded buildings were keyed into the existing boundary walls and new concrete floors layed, including a horse-bath. The stables expanded through time and there had been a number of partial re-floorings of certain areas. Later, in the 1930s Dug Dale, the stable owner, built a bungalow just to the south of the stables buildings, modifying the boundary walls yet again. Although we had managed to find a building control plan of this bungalow in ESRO the builders did not do what they said they would as the two plans do not correlate that well! During the war the stables buildings were demolished and at least four hitherto unknown military huts established on their site. We managed to get some (rather costly) RAF aerial photos from English Heritage which have proved essential. They are the only photos of the stables buildings we have come across to date and show they were still standing in 1942. Luckily the USAF flew over in 1944 and their photo showed the stables gone by then and, much to our relief, our WW2 huts. It is likely that these huts were established in the lead up to D-Day.



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