
SECRETS
OF THE
HIGH WOODS
Revealing hidden landscapes
edited by John Manley

This book is the work of many people – staff, researchers and volunteers – who participated in the Secrets of the High Woods project. Their results and their enthusiasm are captured in their writings and in quotations from people they interviewed. The project was led by the South Downs National Park Authority and funded by the Heritage Lottery Fund.

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'I took a walk in the woods and came out taller than the trees'

Henry David Thoreau,
American philosopher, 1817–1862

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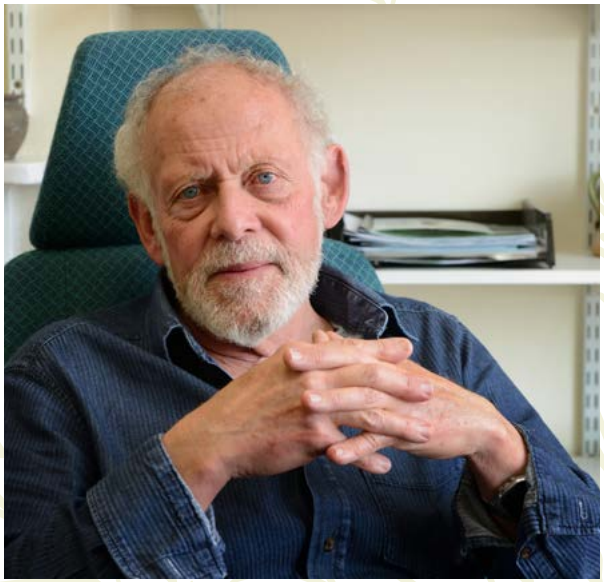


FOREWORD

BARRY CUNLIFFE

In the mid-1950s I spent a number of weekends with a group of local amateur archaeologists, led by John Boyden, exploring areas of the High Woods north of Chichester. It was both exciting and exasperating: exciting because of the superbly preserved ancient field systems that we discovered and exasperating because of our inexperience in being able to record what we were seeing. The woods were too dense and with the ex-army tapes and optical squares available to us it was impossible to make accurate plans. After a few weekends spent in wonder at the extent and preservation of the earthworks hidden in the forest we admitted defeat and moved on to the open downland around Chalton. Good aerial photographs were available there, taken at just the time that the chalkland was being brought into cultivation and the ancient field systems were still clearly to be seen. Subsequent ploughing destroyed all trace of them.

Now, sixty years on, with the aid of LiDAR, the ancient field systems and other earthworks of the High Woods have suddenly become visible over hundreds of hectares of the chalk uplands of the South Downs. Given what we have learnt of similar systems in other parts of Wessex it is no great surprise to discover that the South Downs were also heavily farmed in prehistoric and Roman times, but what is remarkable is the extent and quality of the preservation of the remains.

In the east of the South Downs National Park during the last millennium, apart from a brief interlude of ploughing during the Napoleonic Wars, some areas of chalkland turned to scrub or woodland and others to sheep pastures, and even these became

abandoned and overgrown as sheep rearing became increasingly unprofitable. A more open downland was then subjected to ploughing during WWII and subsequent years (the famous 'plough-up' campaigns of 1940 and 1941 initiated by the government to boost the nation's food supply), resulting in the destruction of ancient field systems. However, the high downs north of Chichester escaped intensive agricultural activity, partly owing to the creation of wooded deer parks after the Norman Conquest and also through the subsequent establishment in the post-medieval period of large estates, parklands and forests owned by the gentry. So it is that, protected by the trees, tangible evidence of the farming systems of our more distant ancestors – the field systems, trackways, boundaries and settlements – have remained in the High Woods, sharply preserved for us to wonder at.

This evidence is a superb resource and must be preserved at all cost, but it is also a challenge: embedded within the confusion of earthworks is the history of farming development spanning the period 1500 BC–AD 500. So many big questions cry out to be answered. What was the landscape like before the intensification of agriculture began in the middle of the second millennium BC? When did the decline set in? How did the Saxon villagers fit into this already structured landscape? And then there are the detailed studies to be made – the careful planning of the communication networks, the definition of territorial boundaries, the identification of settlement nuclei and the need to work out the chronology of it all. It is a daunting task, but one that, carried out at the appropriate level, promises to make a real contribution to our understanding of the past.

It is fortunate indeed that the High Woods have now been designated as part of the South Downs National Park and that local volunteers are already beginning to be involved in exploring the archaeological riches of the area with the help of professionals. It is only in this way that the secrets of the High Woods will be completely revealed and, through their involvement, generations of volunteers will learn the joys of archaeology. This book celebrates the start of that journey of exploration.

PART 1: INTRODUCTORY CHAPTERS

1

INTRODUCTION TO THE SECRETS OF THE HIGH WOODS PROJECT

ANNE BONE

I STARTED WORKING AT THE SOUTH DOWNS NATIONAL PARK AUTHORITY ON MONDAY 11 JULY 2011. It wasn't any old Monday morning. It was a thrilling day. I had to get to know an amazing heritage over a large chunk of Sussex and eastern Hampshire – there was so much to learn, so much to see. And LiDAR was going to be a crucial tool to help me find out even more.

This wasn't the first time, however, that I'd heard about the stunning discoveries made by LiDAR projects and how they could uncover hidden sites in woodland. The archaeologist James Kenny had been full of excitement about it when we'd worked together previously. The creation of a new National Park for the South Downs, and its Authority, with money for projects, was an ideal opportunity to show that, with its help, we could make a real difference to the heritage of an area.

On the open, relatively treeless chalk downs and heaths in the National Park it's quite easy to see the archaeology as obvious humps and bumps in the fields and open spaces. We can survey what we see, and we can protect it if it's important. By contrast, the area of the National Park from the river Arun to the A3 is very different because it has so many forests and woods, which are managed by great landowning estates and bodies such as the National Trust and the Forestry Commission. This area, completely dissimilar to the open downland and heaths, is known in landscape terms as the 'wooded estates'. While these estates contain a wealth of information in their archives about the people who lived and worked in them, complemented by colourful historical maps, we can't see their archaeology because of the tree cover and associated undergrowth. It's so frustrating to be able to follow a length of bank or ditch until it disappears into the trees, and then be unable to pursue it. Unlike on open downland, we can't survey earthworks in the woods, so we don't know their extent and therefore can't protect them.

A LiDAR survey of the wooded areas seemed to be the answer to our prayers – but just a survey isn't enough without validating (or ground-truthing) the suspected earthworks by walking into the woods to locate and measure them. Now, this is pretty groundbreaking stuff in archaeology and I was on new territory, so I needed to find out what other people had done in other LiDAR projects – and what they wished they'd done differently.

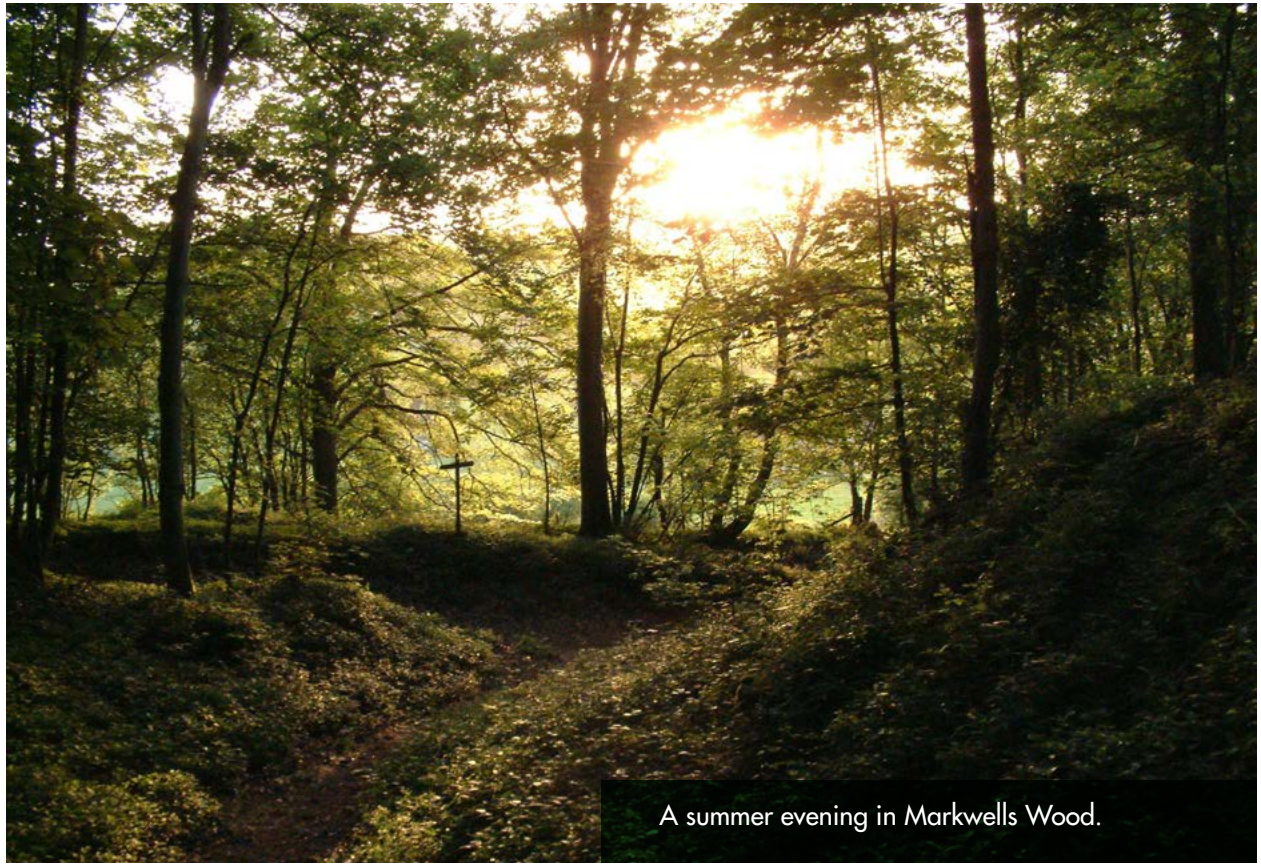
That's what took us to the County Hall at Lewes to look at the Ashdown Forest LiDAR survey – a great survey but one that was underfunded in terms of validation on the ground with volunteers. Another fact-finding trip saw us driving through delightful autumn-browned trees to the New Forest National Park offices. There we enjoyed a great session sharing lessons – we all like to talk about our exciting projects! Oral histories seemed to be a great component to add to any project. People telling their own stories of working in or enjoying our wooded estates would complement the rather voiceless remains that archaeology has to offer. Both these projects

had been funded by Heritage Lottery Fund and, as our ideas got more exciting and more expansive, it was clear that we would need that help too.

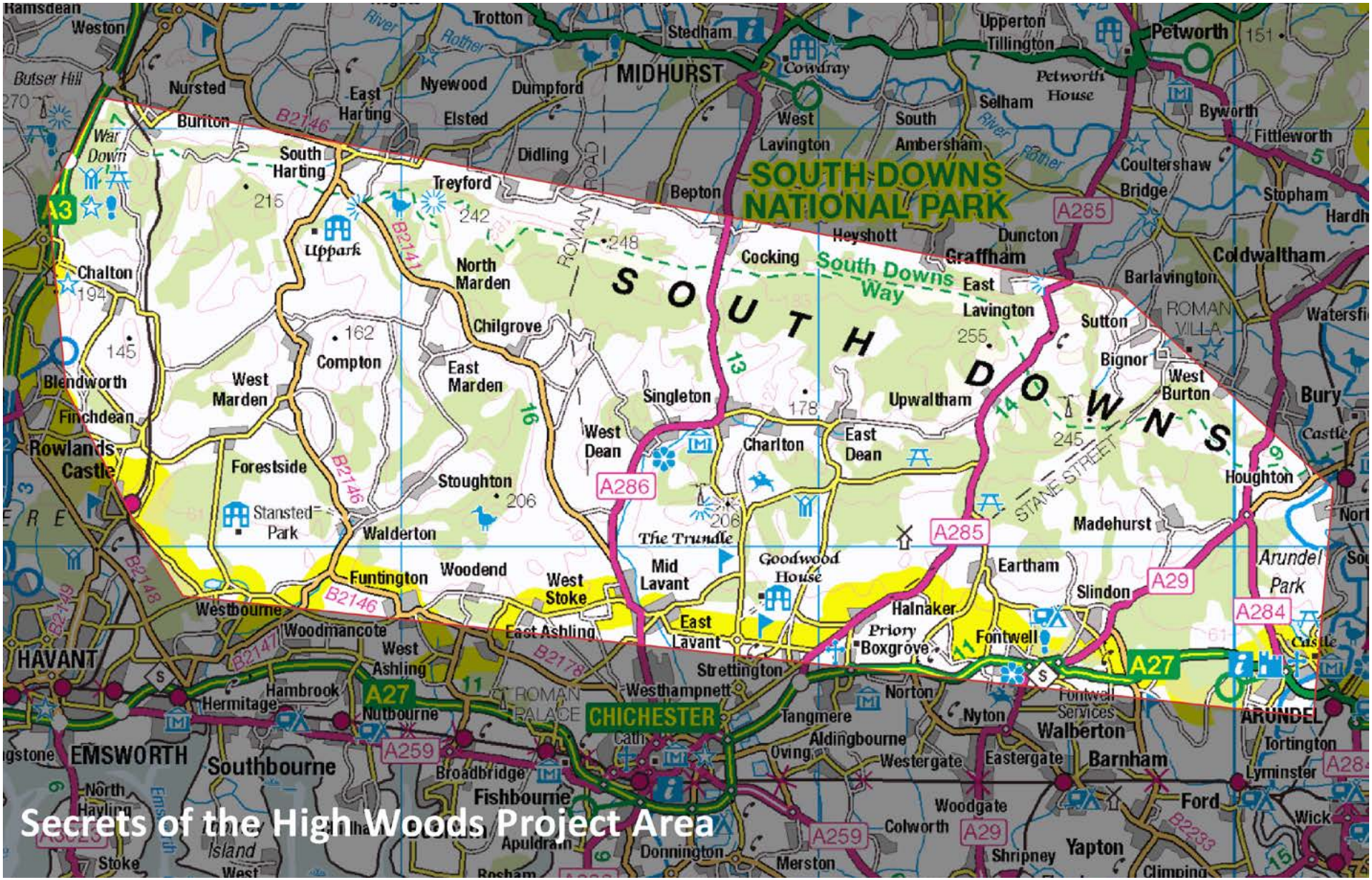
Planning projects is all very fine and necessary – but you can't beat the excitement of seeing the archaeology on the ground. It provides the buzz. It's also important to be enthusiastic when asking for £660,000 from the Heritage Lottery Fund and £130,000 from the National Park Authority. If you're not passionate, how can you persuade other people? So the other members of the project team, Ian McConnell and James Kenny, took me out into the woods to see some of the unrecorded sites they'd come across in their work.

It was a lovely summer's day as we drove out in the Land Rover, bouncing over the forest tracks, eventually pulling over to park. Boots on, cameras in hand, we set off under the trees. We were in 'ancient woodland': tree canopies above us, scattered flowers around our feet, sunlight and shade in ever-changing measures playing around us. We started to walk up the hillside. After a while we crossed steep banks which ran from side to side as far as I could see. Where the bank was worn you could see a great pile of grey and white lumps of flint, just tumbling down the slope. It was a stunning moment when I realised that these were fieldbanks from over 2000 years ago – they were perhaps even 3000 years old. They had never been accurately dated. I was as convinced as any convert. There were great mysteries to be solved here, and LiDAR would come to our aid. We needed grant aid, so it was time to finalise our application proposals, fill in the forms, write the reports, contact landowners – and start talking to potential funders.

A little later, but after a lot of work, we started to be successful in attracting money to run this project, first from the National Park Authority. That particular meeting was on my birthday, and was a lovely way to celebrate another year! Then, in summer 2012, funds came from the Heritage Lottery Fund to develop our ideas. This eventually culminated in our winning a much larger HLF grant, big enough to run the entire project, in the summer of 2013. What follows in this book is what we found amongst and under those trees. I hope these pages manage to convey some of the amazing archaeology mapped for the first time and some of the excitement and passion of the volunteers who helped us. For all of us, uncovering the Secrets of the High Woods has been nothing short of a revelation.



A summer evening in Markwells Wood.


SOUTH DOWNS NATIONAL PARK
SOUTH DOWNS
South Downs Way
ROMAN ROAD
STANE STREET
MIDHURST
Petworth
Cowdray
Petworth House
Upperton
Tillington
Selham
Byworth
Fittleworth
Coultershaw Bridge
Stopham
Coldwaltham
Barlavington
Watersfield
ROMAN VILLA
Bignor
West Burton
Bury
Sutton
Duncton
Graffham
Heyshott
Cocking
East Lavington
West Lavington
South Ambersham
Bepton
Treyford
Didling
Elsted
Dumpford
Nyewood
East Harting
Nursted
Burton
South Harting
Uppark
North Marden
Chilgrove
West Marden
East Marden
Compton
Singleton
Upwaltham
Charlton
East Dean
West Dean
Houghton
Madehurst
Arundel Park
Castle
Eartham
Slindon
Halnaker
Priory
Boxgrove
Fontwell
Fontwell Services
Norton
Nyton
Walberton
Barnham
Ford
Yapton
Climping
Tortington
Lyminster
Wick
ARUNDEL
Tangmere
Aldingbourne
Oving
Westergate
Eastergate
Colworth
Woodgate
Shripney
Merston
Donnington
Apuldram
Westhampnett
Strettington
CHICHESTER
ROMAN PALACE
Cath
West Stoke
Mid Lavant
East Lavant
The Trundle
Goodwood House
Funtington
Woodend
Walderton
Stansted Park
Forestside
Stoughton
Rowlands Castle
Finchdean
Blendworth
Chalton
Westbourne
Woodmancote
West Ashling
East Ashling
HAVANT
EMSWORTH
Southbourne
Hermitage
Hambrook
Nutbourne
Broadbridge
Fishbourne
North Hayling
Stoke
Island
Emsworth
A3
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War Down
Butser Hill
Trotton
Stedham
Nursted
Burton
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Blendworth
Finchdean
Rowlands Castle
Forestside
Stansted Park
Walderton
Funtington
Westbourne
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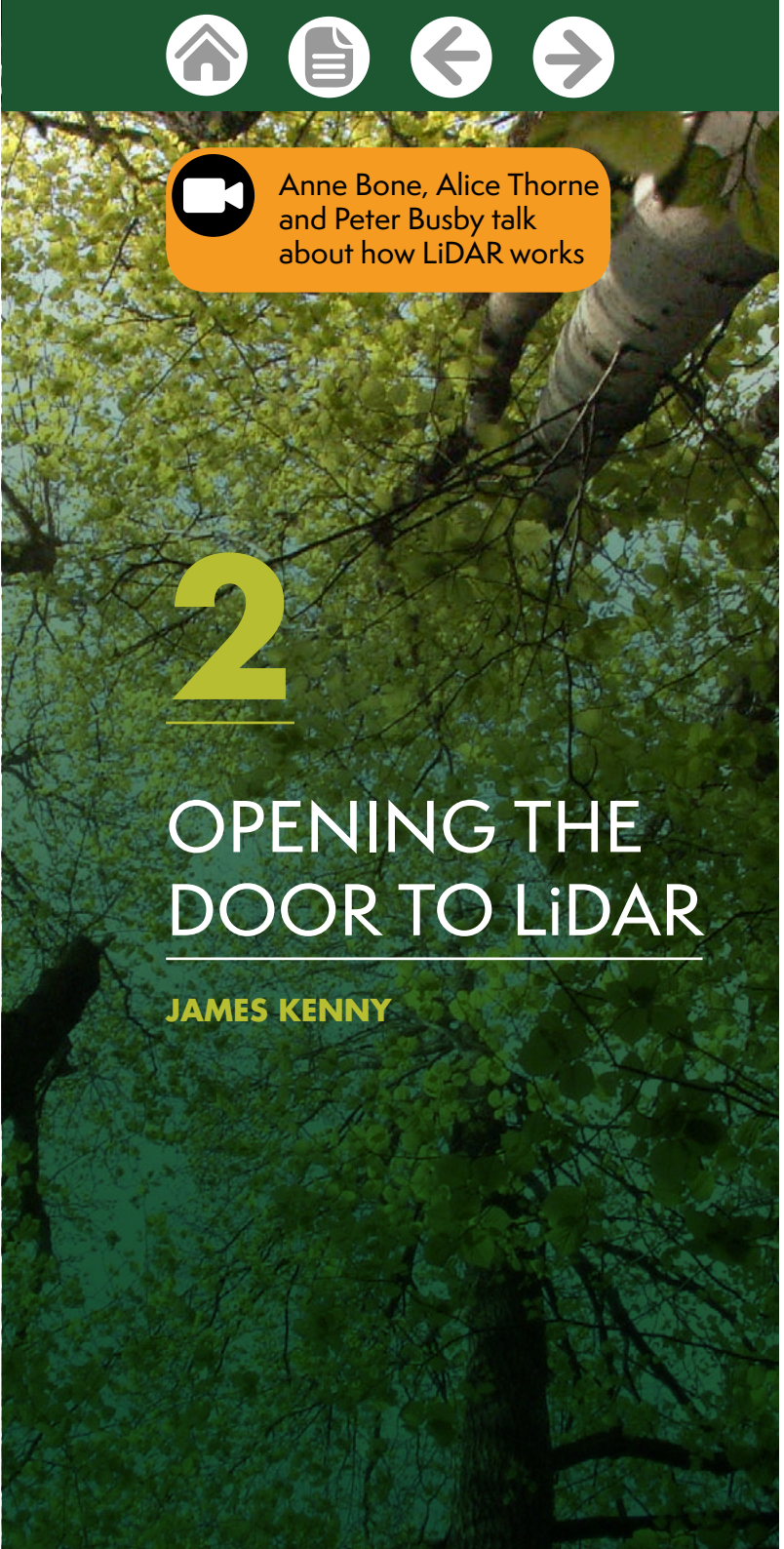
Stoke
Island
Emsworth
Secrets of the High Woods Project Area



Anne Bone, Alice Thorne and Peter Busby talk about how LiDAR works

2

OPENING THE DOOR TO LiDAR

JAMES KENNY

I REMEMBER WHEN I WAS FIRST TOLD ABOUT LiDAR. IT WAS IN 2007, when a colleague introduced me to a website that had a virtual tour of Stonehenge – essentially a 3D flypast based on LiDAR data that had been put together by Wessex archaeology (you can still visit it, at **www.wessexarch.co.uk/stonehenge**). We all thought it was fantastic, but I almost completely missed the point – I thought LiDAR was a way to produce virtual reality and started thinking about how we could apply the technology to making 3D images to help with the interpretation of archaeological sites and monuments. It was only later that I was introduced to the work done by Cambridge University and Forest Research in Savernake Forest and the Forest of Dean, where they had demonstrated the true value of LiDAR in recording earthworks hidden in woodland. But let me wind the clock back.

I grew up a few yards from the main entrance to Arundel Park, where a ban on cars meant children could wander free from traffic and where I discovered my fascination for archaeology. 'The Park' wasn't a great medieval deer park, it was one of those late-18th-century designed landscapes that utilised some very convenient downland and a man-made lake in a pretty valley. It was a picturesque playground for the gentry but, by the time of my childhood, was mainly used for training racehorses, shooting pheasants and grazing sheep. Nevertheless, it offered a number of interesting archaeological sites that small boys could poke around. I remember one year, when the Shepherd's Garden Roman site was ploughed to plant maize for the pheasants, I discovered large quantities of Roman pottery sherds, including samian ware with makers' stamps! To the consternation of my parents I kept quite a selection in shoeboxes under my bed!* This all served to stimulate the latent archaeologist that I think lurks within us all.

> LiDAR – It's the magic bullet we've been waiting for all these years ... from the thirties really towards the end of the 20th century when we were quite aware of the potential of the archaeology in woodland in West Sussex, which is some of the most important archaeology in the country because it's so well preserved, but we're frustrated by the fact that ... it's just so difficult to survey, so difficult to visualise.
>
> James Kenny

Years later and I had graduated in archaeology and was working with the Chichester District Archaeology Unit. In 1989 timber contractors working in East Dean Park made the chance discovery of a Roman cremation burial, complete with a collection of accessory vessels, all lying together in the upturned root-plate of a tree that had been blown down in the big storm of 1987. I went with a colleague to record the location of the discovery, which entailed quite a bit of wandering through woodland before we

A view of Arundel Park. A delightful playground for a young and budding archaeologist – James Kenny.

eventually found what seemed to be the right tree. I made the following note: 'Site visited 25/1/89. No additional finds. The whole of East Dean Park is full of lynchets and other earthworks, mostly in good condition. Presumably this all means that there is a villa hereabouts.' Interest thus stimulated (in those days I was really a Romanist), I decided to see what I could find out about the history of the park and the archaeology within it. It soon became clear that the medieval deer park and the ruined buildings at its centre were the most significant elements, and I was told by local historians that the ruins, known locally as 'King Alfred's Castle', had been partly excavated by a Miss Keef in the 1960s. Apparently she found buildings that she dated from pottery sherds to the 14th century, including the remains of a well and a chimney.

In the meantime I had been involved in the founding of a new archaeology group, the Chichester and District Archaeology Society, and had resolved to try to involve the members in proper fieldwork. It was clear that one of the last great untapped local archaeological resources lay in the earthworks hidden in the woodland of the western West Sussex Downs, and I thought it might be possible for the members of the fledgling society to get involved in recording some of them. East Dean Park seemed the perfect candidate for an attempt, so I put a project proposal together, obtained permission from Goodwood Estate and asked for volunteers.

We undertook the survey in the summer of 1992. The time of the year was a big mistake: all the trees were in leaf and it was almost impossible to use conventional surveying instruments, so the theodolite that I took along was left in its box in favour of even older technology – tape measures and ranging rods. We even tried a technique allegedly invented in the Burmese jungle during the war – using prismatic compasses to take a bearing on the noise of a whistle (with predictable results!). Over several weekends and after a great deal of confusion and wasted effort, we just about managed to produce a plan of the medieval site that was approximately

accurate. It was obvious that the intended lynchet or ancient field boundary survey wasn't a practical proposition – apart from the virtual impossibility of identifying relatively slight earthworks amongst the thick undergrowth, the real issue was that it was just too difficult to survey them. We gave the whole thing up as a bad idea and reverted to digging holes on the coastal plain.

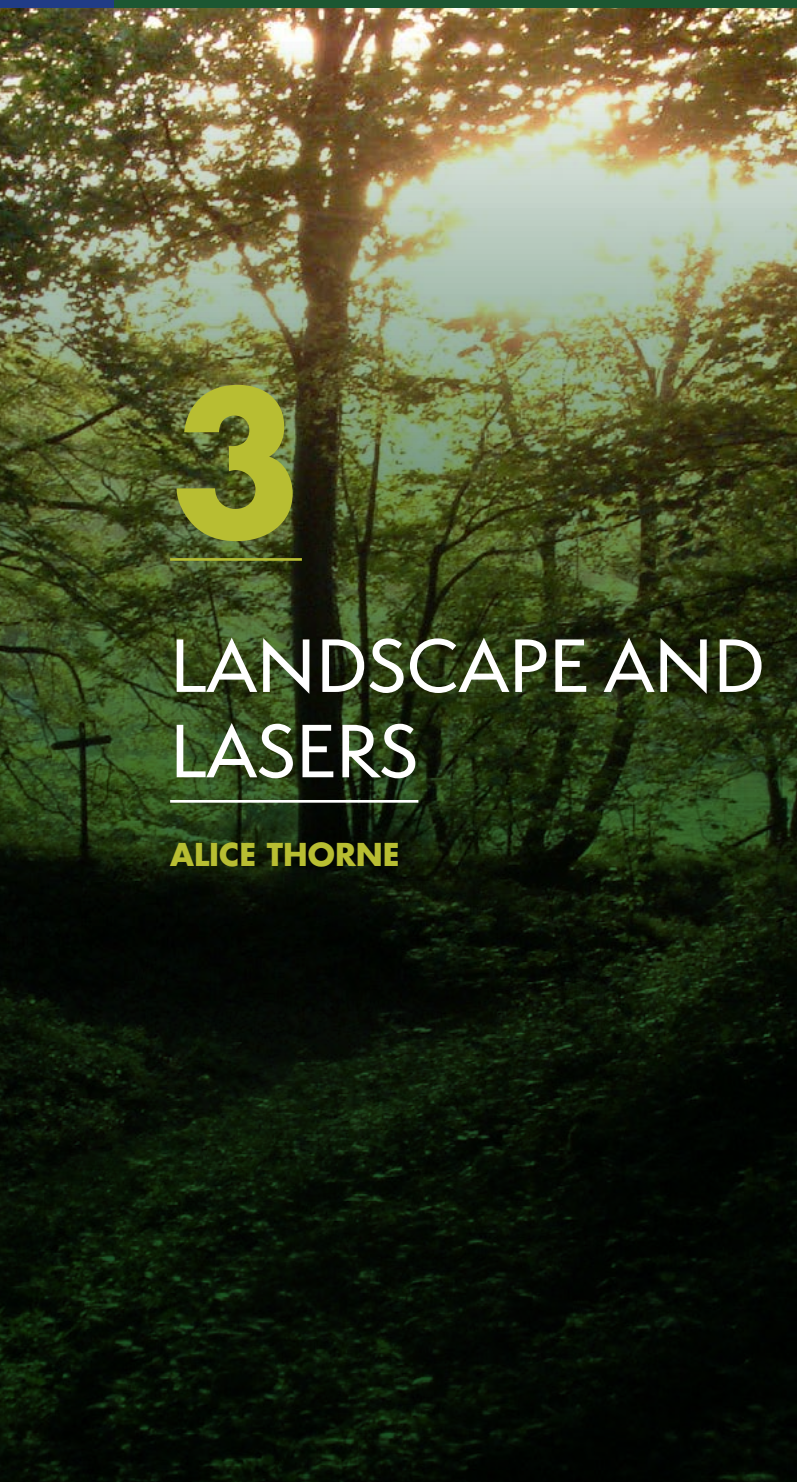
Over the next fifteen years experience only served to strengthen the conviction that something had to be done to record the archaeology hidden in, and preserved by, the woods. I remember discussions with very sympathetic colleagues at English Heritage (now Historic England), especially members of its aerial photograph plotting team and surveyors of the Royal Commission on the Historical Monuments of England (RCHME). But the only real progress towards a LiDAR project for the South Downs came with the involvement of members of staff of the Sussex Downs Area of Outstanding Natural Beauty. With their encouragement and support, and that of our English Heritage Field Monument Warden, an attempt was made to persuade Natural England to let us use Environmental Stewardship funding (the grants that farms get to support environmental improvements) for a LiDAR survey. Natural England had previously agreed to LiDAR projects elsewhere funded from the same programme.

I put together for Natural England a project to capture LiDAR data for discrete areas covering either Bow Hill or East Dean Park and its surrounds. Funding for ground-truthing would have to come from elsewhere at a later stage. This was early in 2010; the recent recession had begun to bite and it was becoming increasingly manifest that the Chichester District Council would not be able to provide any funding at all. We then received the reply from Natural England – that they did not consider it appropriate to use Stewardship funding for any further LiDAR projects. That shut the door. It seemed the project would never happen.

Hiorne's Tower in Arundel Park – an 18th century folly built by Sir Francis Hiorne to prove his architectural ability to the 11th Duke of Norfolk.

Just over a year later the South Downs National Park was operational and their Cultural Heritage Strategy Lead became interested in the prospect of a 'flagship' project. That door was eased open again. The Secrets of the High Woods would at last be revealed by LiDAR.

* Years later, when they ploughed Shepherds Garden again, I took the collection of Roman sherds and put them back as near as I could to where I'd found them!



3

LANDSCAPE AND LASERS

ALICE THORNE

WHEN I FIRST JOINED THE SECRETS OF THE HIGH WOODS PROJECT, it was with a mixture of trepidation and excitement. I had a lot to learn about Airborne Laser Scanning. But I also knew this tool was going to provide us with an extraordinary opportunity to explore this incredibly important archaeological landscape.

The South Downs have been at the heart of archaeological research in south-east England for centuries. The open chalk downlands have been at the forefront of much work, and consequently the wooded landscapes of the central downland are less well understood. Here, comprehensive survey has been hampered by the presence of large blocks of woodland. Knowledge of the archaeology preserved within the woodland has often come only from glimpses in clearings shown in aerial photographs, targeted research excavations and frequent, mostly unmapped, observation of earthworks.

The Digital Terrain Model (DTM) derived from Airborne Laser Scanning would provide us with a unique opportunity to investigate this landscape in the kind of detail never before possible. So, the learning curve was steep – and swift! With only two and a half years at our disposal, the entire project needed to be set up from the beginning and all the systems put in place. The team thus plunged into the task of delivering this community-based archaeology project.

AIRBORNE LASER SCANNING

Airborne Laser Scanning, commonly known as LiDAR (Light Detection and Ranging), is a remote-sensing technology that captures detailed 3D terrain data. A sensor attached to the bottom of an aircraft transmits millions of pulsed laser beams as the plane flies in swathes back and forth across the landscape. The beams of light can penetrate porous structures such as the woodland canopy. The sensor will measure and record multiple reflections, or 'returns', of the light beams from objects encountered on the way to earth. The last return reflection is recorded typically from the ground surface. As a result, the data set collected contains detailed information about both the surface of the landscape and the vegetation and structures located upon it.

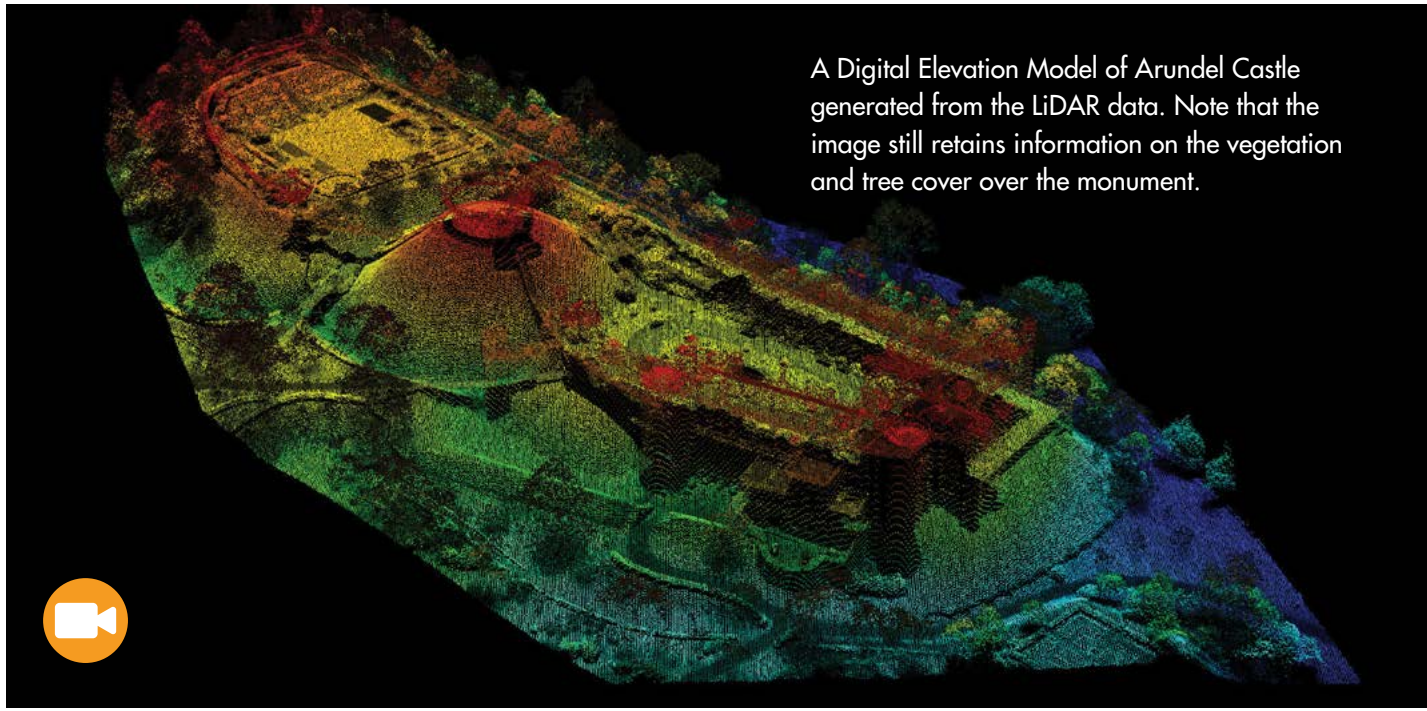
Critically, the point density, measured as the number of returns per square metre, determines the detail of the model; the more returns per square metre, the higher the resolution and the greater the clarity. Our then project manager Rebecca ensured that we obtained the best-quality data we could by commissioning a high-resolution survey and by ensuring that the data were captured at the right time of the year. By specifying a flight at the end of winter, the opportunity for the laser to penetrate the woodland canopy was maximised. Data for the entire project area were captured during a single day, in late March 2014.

LiDAR PROCESSING

Raw LiDAR data is captured as a 'point cloud' – literally, a cloud of 3D points. At 0.25-metre

spatial resolution, the data set obtained by the Secrets of the High Woods project is particularly detailed, enabling highly accurate models of the landscape to be generated. However, several processing stages are required to transform this raw data into models that can be utilised for archaeological prospection.

The first step is to create Digital Elevation Models (DEMs). These models, which depict the physical landscape, are of two types. Digital Surface Models (DSMs) are typically generated from the first return data captured by the survey and, as such, retain and include all the information about the vegetation and buildings which characterise the landscape. These models are extremely useful for landscape analysis, providing a structural and environmental context. However, in wooded areas it is the second form of model, the Digital Terrain Model (DTM), which proves most fruitful for archaeological analysis. The point cloud is classified into 'terrain' and 'non-terrain' data. Non-terrain data, such as buildings and trees, can then be selected and digitally stripped away, leaving a 'bare earth' model of the underlying terrain – the DTM. These models depict the land surface unobscured by vegetation and buildings. A further range of different LiDAR 'visualisations', or models, derived from the DTMs are necessary to highlight topographical changes and bring potential archaeological features to light. So the magic of LiDAR lies really in these kinds of data processing.

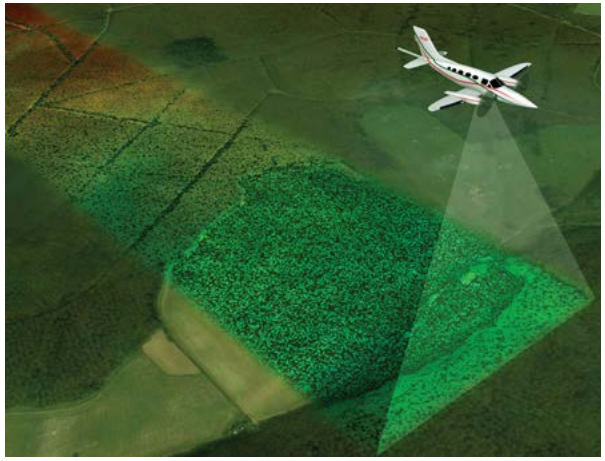


A Digital Elevation Model of Arundel Castle generated from the LiDAR data. Note that the image still retains information on the vegetation and tree cover over the monument.

MANAGING THE DATA

The High Woods project is founded upon a valuable set of survey data providing a level of detail currently unsurpassed for historic landscape analysis in the area. But how to manage such a collection? We needed a computerised system which would enable the project to host and manipulate the LiDAR data, alongside a wide range of other geospatial heritage data.

There were other major project requirements as well. In order to be able to quantify such a complex archaeological landscape within the short duration of the project we needed to commission a National Mapping Programme (NMP) report (see Chapter 4) to map and



Airborne Laser Scanning, commonly known as LiDAR is a remote-sensing technology which captures detailed 3D terrain data.

record features across the whole project area. Finally, the system would also be required to collect and manage all our volunteer fieldwork data records.

To overcome this challenge, a Content Management System was developed specifically for the project. Rebecca worked closely with Steve Smith, a software mapping specialist, to develop a bespoke system designed to cater for project requirements. This used a piece of community open source mapping software known as HEROS.

This Geographical Information System (GIS) database and mapping system allowed all our data to be hosted and accessed in a central web interface. It has underpinned an exciting new method of undertaking National Mapping Programmes, enabling the concurrent digital transcription and interpretation of features by multiple users in different locations. It has also enabled us to develop a computerised recording method for volunteer use in the field.

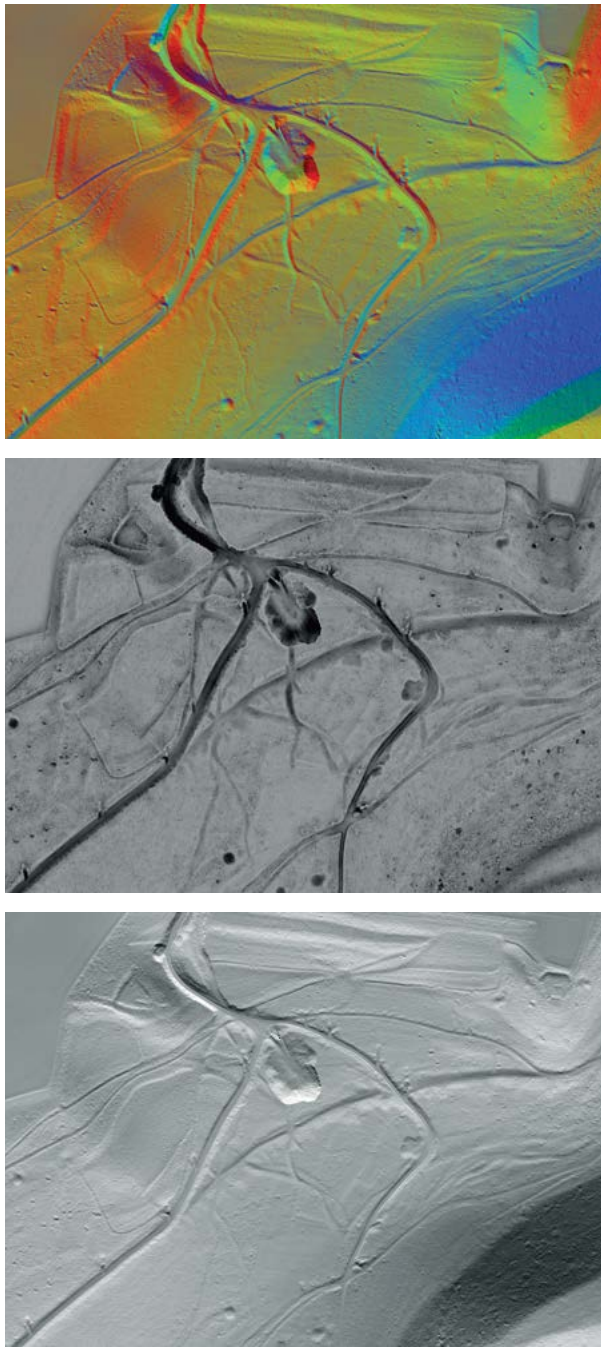
RESULTS

The technologies of LiDAR and associated data processing are remarkable enough, but it is the results which are simply wondrous. The survey has revealed an extraordinary, complex and well-preserved archaeological landscape. Many new discoveries have been made, testifying to the incredible value of Airborne Laser Scanning for landscape analysis, particularly in wooded environments. LiDAR helps us to move from the identification of individual monuments in isolation to understanding how these monuments related to their wider landscape and how they form part of a landscape which has changed and evolved over millennia.

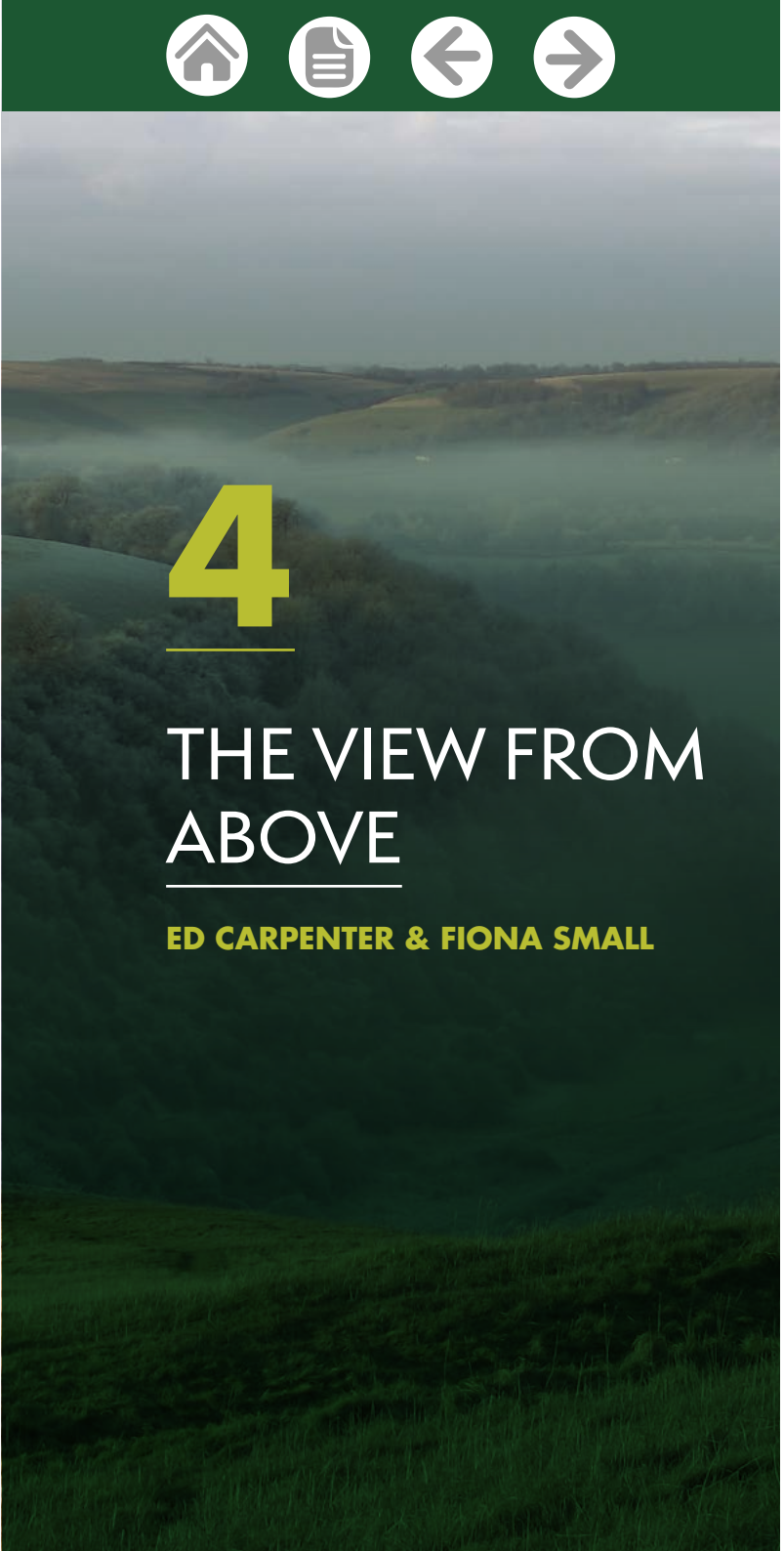
> LiDAR … it absolutely has transformed how we gather data; the rapidity of it and the volume of it is staggering, but it presents challenges … . What do we do with it? How do we make sense of it?
> David McOmish

> So, LiDAR first, a really intensive analytical field work. Second, and to really get the evidence – excavation.
> Barry Cunliffe

LiDAR interactive map



Some of the many different visualisations of LiDAR data, demonstrated on earthworks from Bignor Tail Wood. At the top is a colour composite model, in the middle an openness positive model, and at the bottom a hill-shaded model.



4

THE VIEW FROM ABOVE

ED CARPENTER & FIONA SMALL

STUDYING A LANDSCAPE FROM THE AIR is an invaluable way to identify new archaeological sites and better understand the historic landscape. This 'view from above' is relatively novel and certainly provides a view of the historic landscape unfamiliar to those who created it. The Secrets of the High Woods was not the first aerial survey Historic England had carried out on the South Downs, but the extensive woodland across the project area gives this central section of the National Park a very different character from that of the open downland further east. We were not entirely sure what to expect when we began this project, although we did know something of the early inhabitants of the South Downs from archaeological investigations carried out in the 19th and 20th centuries. These were largely concerned with archaeological sites situated on patches of downland between woodlands. Particularly tantalising, however, were the references made by these earlier archaeologists to earthworks continuing into the woods.

LiDAR

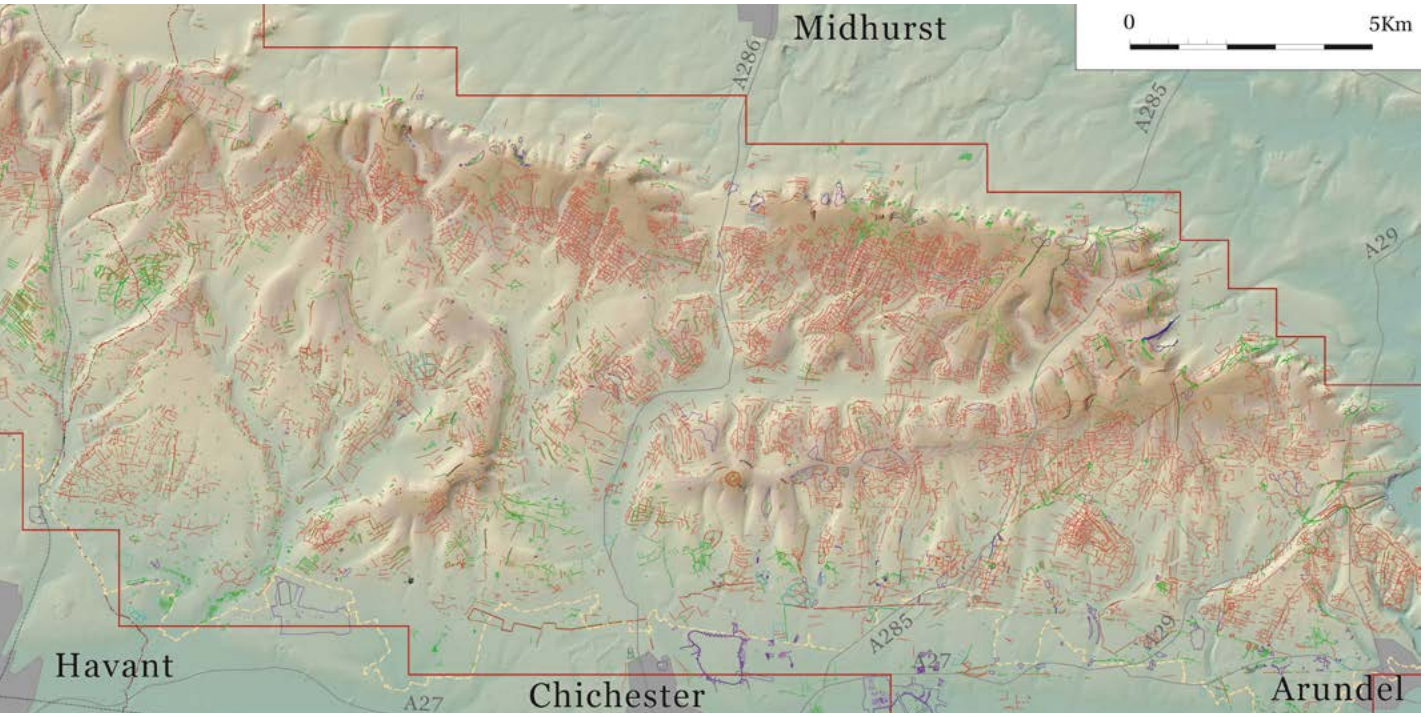
Woodland can be a great hindrance to archaeological investigation, but LiDAR gave us the opportunity to see clearly the monuments that earlier archaeologists had only caught glimpses of within the woods. The LiDAR recorded extensive earthwork remains and we were almost overwhelmed by the sheer quantity and quality of earthworks preserved within the woodland. When this imagery was interpreted it was clear that these earthworks could be dated to many different periods stretching back into prehistory. Most extensive of all were the near-continuous remains of prehistoric field systems.

FAMILIAR PATTERN, REMARKABLE PRESERVATION

These field systems consist of small, tightly packed fields defined by lynchets. Some small enclosures may mark the location of settlements, and trackways running between the fields apparently link these together. Some of these field systems may have originated in the Bronze Age and, after suffering abandonment, appear to have been brought back into use in the Iron Age and Roman periods. The pattern of fields seen from the air is a familiar one and has been noted elsewhere on the South Downs and on other areas of chalk downland across the country. What is so remarkable about the fields seen in the High Woods is their good state of preservation – they appear to have lain untouched since their abandonment. Across the country the earthwork remains of prehistoric and Roman field systems are best seen on aerial photographs taken in the 1940s as, from this decade onwards, these prehistoric landscapes were beginning to be ploughed up. We are far more used to seeing their gradual levelling, as opposed to their survival, in the post-WWII decades.

CROPMARKS

Even when historic sites have been levelled by the plough substantial elements may survive beneath the surface. These buried remains



An outline of the project area, indicating in red lines the extent of the 'new' archaeology surveyed and recorded by LiDAR. The green lines are features mapped by Historic England from aerial photographs.

can affect the growth of the crops above. These cropmarks will form when the conditions are right and are best seen and understood from the air. Where identified on aerial photographs in the High Woods, these buried sites were added to the map produced from the LiDAR imagery.

COMPLEX PICTURE

The results of the aerial survey have revealed an archaeological landscape that is breathtaking in its complexity and extent. The identification of surviving earthworks combined with evidence of buried archaeology provides a detailed picture of how this landscape has been utilised over time. Individual sites can be understood in relation not only to monuments of the same age but also to earlier features in the landscape. We can start to see where the earlier landscape has influenced what has come later. The results provide examples where earthworks have been reused again and again, such as the field boundaries established in the prehistoric period that are still used as boundaries today.

> It's no exaggeration to say that this has allowed us to see a complete landscape of archaeology, which is an extremely rare thing ... the field systems, the boundaries between the fields stand still as earthworks, and it's possible to see the whole landscape of them. Somewhere in there will be the settlements, certainly the burial mounds, the hillforts. There will be the dewponds and the wells and all of the paraphernalia of human management of the environment going back to really the earliest times of management of the natural environment.
>
> James Kenny

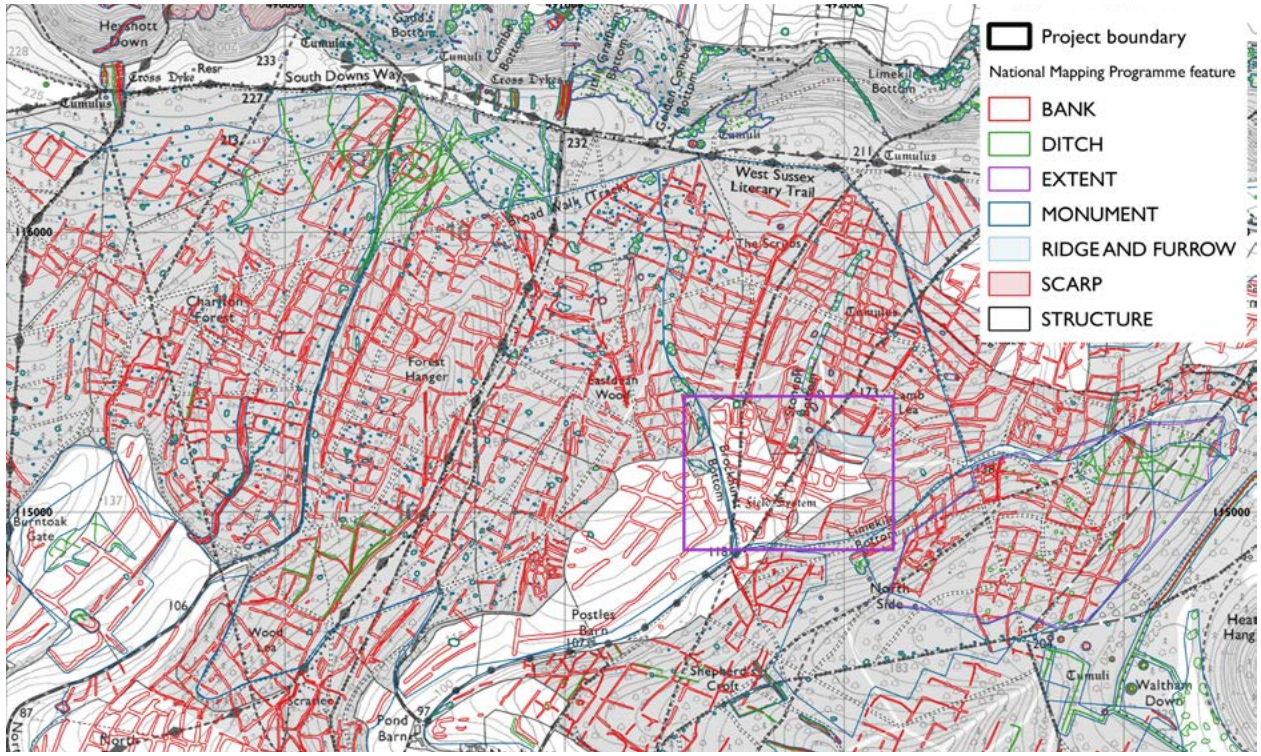
The results also show where existing features have been ignored, such as the medieval boundaries that cut across earlier earthworks. In addition, they highlight other relationships, seen clearly, for instance, where Roman Stane Street cuts through older fields. These findings are already beginning to answer specific questions. There had been speculation as to the existence of a Roman road between Chichester

and Arundel since the first half of the 20th century, but the line it followed was unknown. One of the highlights of this project has been the confirmation of its existence. Cropmark and earthwork evidence have been used to identify part of this road and so begin the accurate recording of its course (see Chapter 24).

CONCLUSION

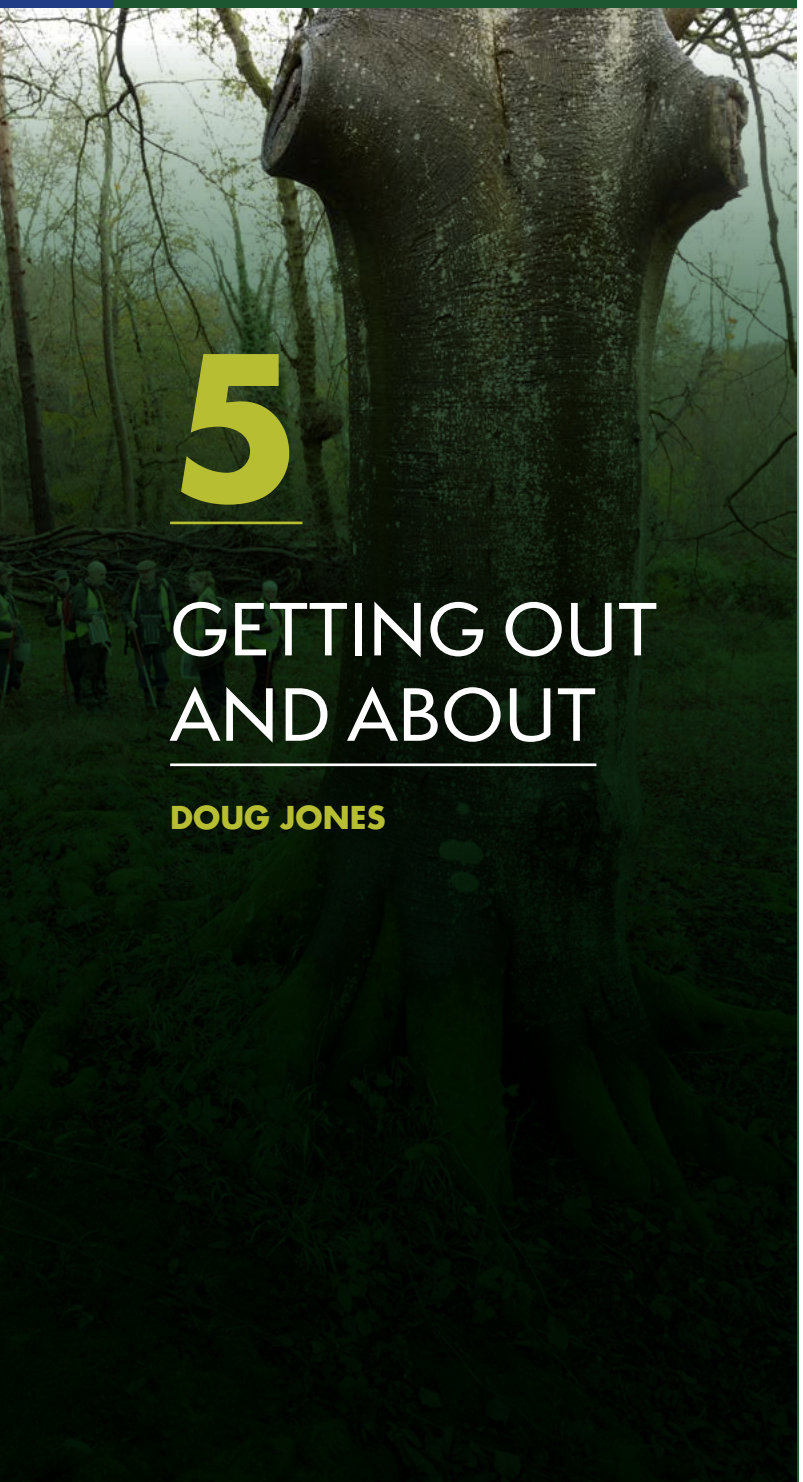
The identification and the mapping of the archaeology of the High Woods are the first steps towards an improved understanding of this landscape. Through such an understanding of this part of Sussex and Hampshire we may hope to gain insights into the similar but now lost earthwork landscapes that once existed on other parts of England's chalk downland. Furthermore, these earthworks provide a tangible link to the men, women and children who made their marks on this land millennia ago. In 1902 the Sussex poet and author Hilaire Belloc wrote in his book *The Four Men*: 'He does not die that can bequeath some influence to the land he knows.' These previous generations live on through their fields, trackways and settlements, which have been seen from the air with such crystal clarity. And on the ground we can walk across the same fields, and along the same trackways, experiencing the same gentle undulations in the land that they too must have felt.

An investigation and analysis of the South Downs National Park – The High Woods from above, NMP 2016.



The Lamb Lea field system is set in its broader landscape context in this map prepared by the National Mapping Programme of Historic England.

An action shot of the National Mapping team at Historic England! The two small viewers (on legs) on the table allow the team to view two-dimensional aerial photographs in three dimensions.



5

GETTING OUT AND ABOUT

DOUG JONES

AS SOMEONE SELECTED TO BE A MEMBER OF THE NATIONAL PARK AUTHORITY I was delighted to hear about this project when its successful bid for major Heritage Lottery Funding was first announced in 2013. And I was subsequently able to join the Secrets of the High Woods team as a volunteer, taking part in some fascinating activities, learning a range of new skills and helping to discover information about this very special area.

All Members of the National Park Authority are able to attend regular tours and visits to different parts of the Park to illustrate aspects of the Authority's work and the challenges being faced and addressed. But much of our time is inevitably spent studying reports and considering decisions on strategic matters. Now this is obviously necessary but it does mean we spend quite a lot of time sat inside the South Downs Centre in Midhurst! So, to be able to grasp this opportunity to take part in this project, to get out and about and to discover in a hands-on way what the Park has to offer to the public was a welcome adjunct to our responsibilities – and a real treat.

Trying to interpret some of the LiDAR images was great fun and I will always remember the moment when I first spotted a chain of small chalk quarries strung out along the scarp-face of the downs, almost like a necklace of beads. I have lived within a few miles of these old quarries for about thirty years but had simply never been aware of their existence because they have all become completely overgrown with scrub and tree cover during the last century and a half. Chalk was important in the production of lime; it was also used in agriculture, and as a component in making mortar. These small quarries help to tell part of a story about how people have exploited the resources of the South Downs. With the arrival of the railways and the industrial revolution, they became redundant and larger quarries opened in other places.

After poring over a wide range of LiDAR images, the opportunity of finding out 'on the ground' what things actually looked like (and beginning to think about what they might have been) just multiplied my interest. I was fortunate to not only to help locate the chalk quarries and remains of old lime kilns but to be amongst a group of volunteers who gradually discovered a series of foundations of a number of as yet unspecified military buildings in the underwoods. It was sometimes quite hard work to reach the places where the mysterious shapes were hidden. Deep in the woods, battling through the vegetation, I am sure some of us thought we were a chalkland reincarnation of Indiana Jones!

I very much enjoyed studying some of the wealth of material in the county record office too. This revealed to me just how lucky we are to have such wonderful documents from years gone by. But, if I had to choose, the real highlight of my involvement as a volunteer was conducting some of the oral history interviews.

It was a huge privilege to meet and chat with some of the people who have helped to shape and conserve the Park's landscape over recent decades. Their knowledge about the

area (past and present) was often inspirational and always passionate. Richard Williamson describes himself as an 'observer' rather than a scientist, but his intimate knowledge of one of the first National Nature Reserves to be designated in the country, at Kingley Vale, just outside Chichester, and his appreciation of the surrounding countryside, were extraordinary. His knowledge of the local past stretched from the Stone Age through to WWII and the present day.

> Volunteers bring so much to it. They not only bring their enthusiasm and their energy but come from all walks of life – and everyone has a contribution to make, everyone will ask a question from their own position, which will make you think in a totally new way, so I think volunteers are absolutely essential to archaeology.
> Barry Cunliffe

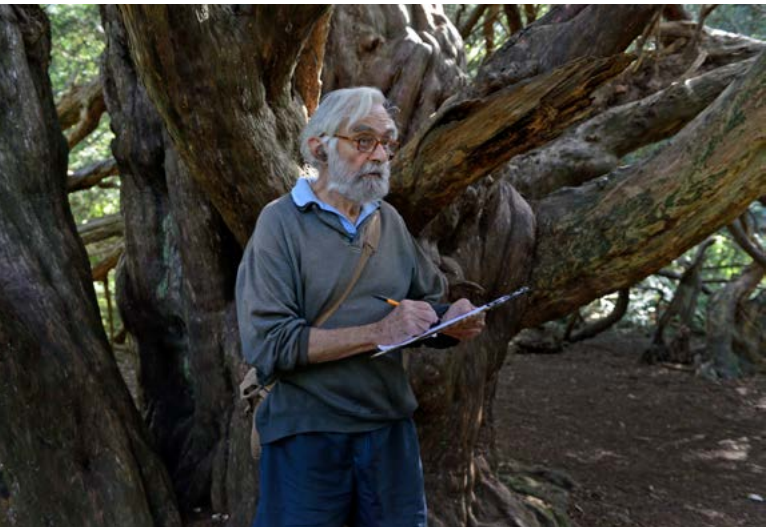
Richard was appointed Warden for the Nature Reserve in 1963 and arrived with two suitcases containing his bird and botany books tied onto the back of his beloved BSA motorbike. In his role as Warden he spent many years living in an isolated cottage in the middle of a coppiced wood surrounded by bluebells, wild daffodils, orchids and rare butterflies. It was a privilege to visit him at home and to learn so much from such an entertaining and knowledgeable man. 'Thank goodness the downs became a National Park,' he said, before the interview had really started. 'This offers a valuable opportunity to conserve the area whilst encouraging people to enjoy and understand it.'

The LiDAR survey had revealed hundreds of lumps and bumps in the Nature Reserve and Richard was able to breathe life into these. The Reserve contains some of the most important archaeological sites in southern England, with over a dozen scheduled ancient monuments, including burial places of ancient chieftains who had lived there more than 3000 years ago, evidence of prehistoric

A guided archaeology walk for volunteers of the Secrets of the High Woods project on The Trundle, an Iron Age hillfort, in September 2015.

Discover how the Trundle has developed through the ages in this short video.

Come and discover the secrets of the Trundle using these self-guided walk leaflets.



Richard Williamson, retired Nature Reserve Warden at Kingley Vale, West Sussex, on a tour of the nature reserve monitoring bird and insect populations.

Sometimes you just can't beat a good bit of old-fashioned technology. Here a magnifying glass helps to decipher old documents at Arundel Castle Archives.

flint mines, signs of medieval settlement and abandoned dewponds. Richard also explained that the area has been used for military practice for over 150 years and that evidence (often unexploded!) can still be found from the time of the Boer War through to WWII, when Canadian troops used the area for training. In 1944 the valley was used as a collection point for allied troops in the run-up to D-Day.

For over fifty years Richard has conducted weekly monitoring surveys in Kingley Vale. These have shown the huge diversity of wildlife, flora and fauna that exists and how it has reacted to a range of conservation management techniques and to climate change. 'Sometimes you don't always get what you want,' he explained, 'but you have to look after the rarest things.'

I'm sure that Richard is only one of dozens of experienced individuals who have been interviewed as part of this project. It is wonderful that the High Woods project has tapped into so much knowledge. It has demonstrated that there are a variety of ways for more information to be collected in the future.

So what do I conclude? I think that the whole project has, in effect, held a big magnifying glass over a relatively hidden part of the South Downs. It has revealed so many new facts and features. It also holds out the promise of doing much more in the future, as the project records and database will provide a legacy and resource for research for years to come. Having enrolled as a South Downs Volunteer to take part in this project I can recommend it to everyone. You meet some great people, take part in some fascinating activities and get a chance to explore a very special landscape. And, although I perhaps shouldn't say this, whenever I'm sat in the South Downs Centre in the future, considering another weighty report, there'll always be a part of me that would like to be out in the High Woods on the trail of one of those LiDAR anomalies!

I arrived there in September 1963 and it had not been managed at all, which was a problem because rabbits had managed it for centuries, keeping the grass nice and short, and then all of a sudden the rabbits died in 1952–3 and the grass started to grow – and so did the brambles and the wood and the whole of that lovely big dry valley, grassland valley, was going to turn into woodland, which we didn't want. That wasn't why it was declared as an NNR. It was declared because it was thought to be the finest yew forest in Europe … and what was described as the finest view in Britain from the top of the hill by Sir Arthur Tansley.

Richard Williamson

PART 2: RESEARCH METHODS

Alice Thorne talks about the value of community archaeology.

6

COMMUNITY ARCHAEOLOGISTS

ALICE THORNE

ONE OF THE PURPOSES OF THE SECRETS OF THE HIGH WOODS project was to raise awareness of the hidden heritage of the wooded downs and to engage the public in exploring and researching our past. The South Downs have been shaped and modelled over thousands of years by generations of people, and the LiDAR survey provides testimony of the depth and complexity of these historic and prehistoric landscapes.

Through the High Woods project we wanted to encourage people to become actively involved in the process of discovering our rich cultural heritage. With the help of people-participation we have been able to support the South Downs National Park Authority in protecting and exploring this very special landscape. Ultimately historic elements from our past have a much better chance of preservation if as many people as possible care about them. Of course, there is legislation to help in some cases, but local people are the best protectors. And knowledge and involvement with their past can enrich peoples' lives in the present in all sorts of surprising ways. So, one of our aims was to create a whole new army of community archaeologists!

The Secrets of the High Woods generated a large amount of public interest from the outset, with over 180 people signing up as volunteers. This was very encouraging, but also posed some significant challenges in designing the project. Our volunteer base contained lots of different individuals, with different perspectives, interests and expectations. We had a spectrum of backgrounds, from people with little or no previous experience of history and archaeology to seasoned professionals attracted to the project by the lure of compelling technology and the promise of new discoveries.

How to appeal and cater for such a broad variety of people and approaches? How to develop something that was flexible and

Just look what I've found! A young archaeologist shows off his find of the day – perhaps a flint tool more than 3000 years old. From the excavations at Whiteways in 2016.

inclusive, rather than rigidly prescriptive? We wanted to create a project that could provide guidance and focus but also allow people to find their own interests and take ownership of their own research. We needed a volunteering structure that enabled people to engage in a way, and to an extent, that suited their lifestyles.

> I don't think there's ever been an archaeology project that has resulted in such benefit … to the general archaeological knowledge, to the amount of new archaeology that we've discovered. There's never been a project as good as this. Not ever.
> James Kenny

Luckily we had a great tool to help us achieve this. The LiDAR survey has provided so much new information that there was something here which could appeal to almost everybody! The intriguing images of trackways, field systems, barrows and numerous humps and bumps, previously hidden by the tree cover, invited speculation about what they could be. Nagging curiosity is a powerful motivator and many wanted to get 'out in the field' to find out what these features really were.

Volunteering on the project was divided into three main categories – Fieldwork, Archival Research and Oral History. By using the survey data as a foundation, each of these elements could exist as standalone opportunities in their own right. This enabled us to appeal to different interests and preferences. Some people favoured working with archives, searching through historic maps and old documents. Others wanted to use their skills in capturing interesting stories and information from people who know and manage this landscape. And there were some volunteers who preferred the great outdoors, exploring archaeological landscapes out in the field.

Which way do we go now? Volunteers check their bearings at Queen Elizabeth Country Park, Hampshire, with the use of LiDAR imagery.

However, archaeological knowledge is built up slowly by utilising different kinds of sources. It is this cross-referencing of information from complementary resources which helps us put together a fuller understanding of the past. By encouraging volunteers to try different approaches, we demonstrated how consulting various information sources alongside the LiDAR models assists people in developing more detailed knowledge of the historic landscape.

This was achieved in many ways in the High Woods project. Earthworks identified during fieldwork can often be verified by going back to the archives to pore over ancient maps or documents. Conversely, when identifying a possible historic site or feature on an old map, or in an ancient document, then a search of the LiDAR imagery, or some of the existing Historic Environment Records (usually maintained by the local authority), can help us to find out much more. Wide background reading and research is essential to build up knowledge of the range of different features and periods that characterise our historic environment. But never forget the importance of talking to local people too: those who live and work in the local area, especially those who work on the land.

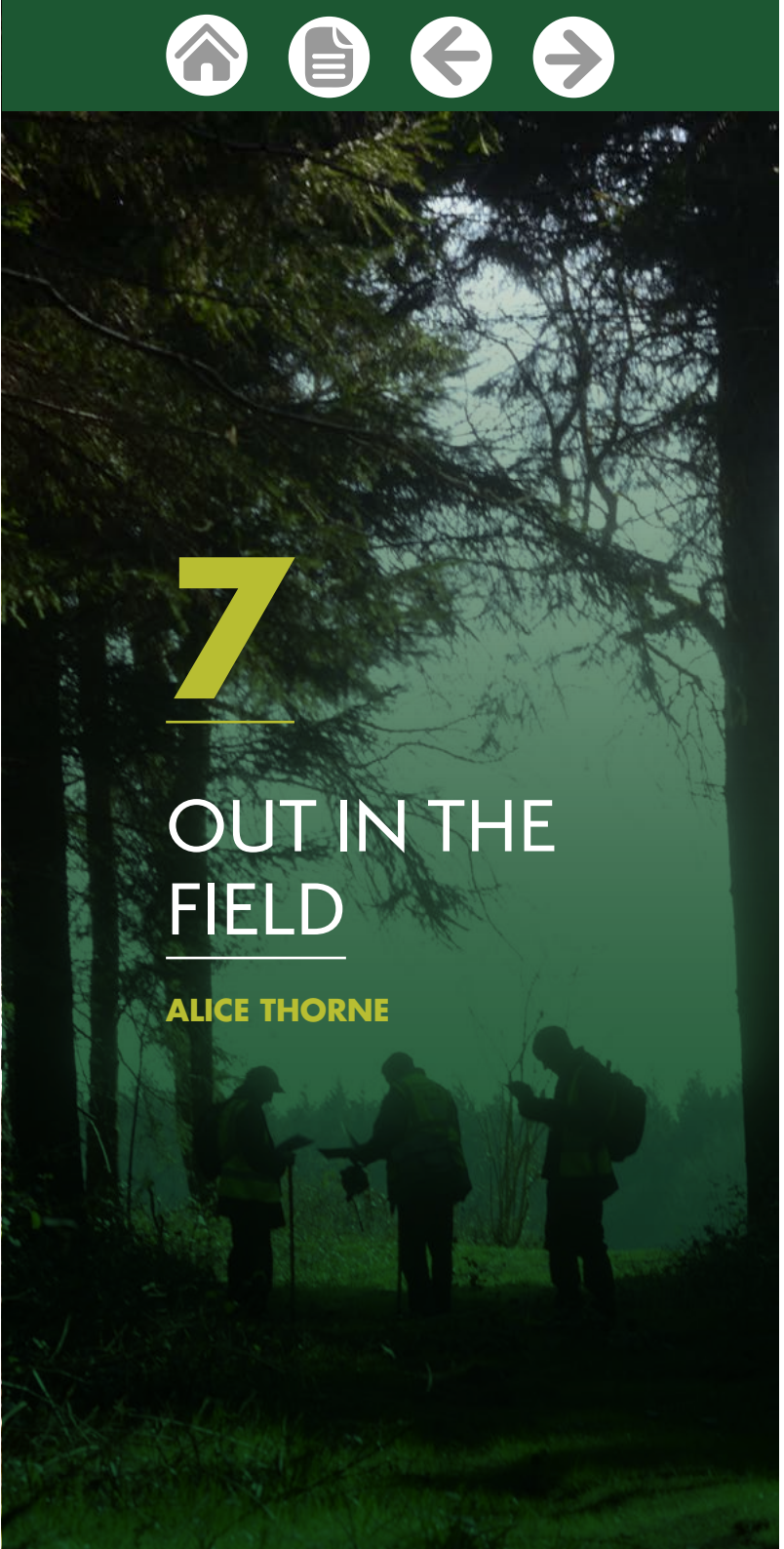
Whilst the three main strands of the project, Fieldwork, Archival Research and Oral History, formed the core of the volunteering opportunities, technical training sessions, guided walks, tours, workshops and community excavations have helped to build the depth of volunteer experience. It really was a joy to see people work together, grow their understanding and increase their enjoyment.

By introducing a range of techniques and approaches we hope that we have demonstrated what a broad discipline archaeology is, and how it pulls in information and sources from a wide range of approaches. The LiDAR survey has proved to be a magical resource for engaging people, and has provided an entirely new perspective on the past landscapes of the project area.

It's important to acknowledge that through the High Woods project we have made only a miniscule advance into the research possibilities the landscape offers. In effect, we have just barely scratched the surface. But we hope we have provided a springboard and raised an interest and an engagement among people that will continue to fuel investigation into the historic and prehistoric environment for many years to come. Our small army of community archaeologists has been well drilled. And they are very, very enthusiastic.

> Just to spend some time with people who are coming at it from a different perspective, who will then see things differently and ask different questions as well, and challenge those accepted notions of landscape development … it really makes you think about your own knowledge.
>
> David McOmish

Archaeologist Alice Thorne explains to volunteers what kinds of archaeological sites to look out for in Queen Elizabeth Country Park, Hampshire.



7

OUT IN THE FIELD

ALICE THORNE

ARCHAEOLOGY IS THE STUDY OF PEOPLE IN THE PAST. Standing in the midst of the South Downs National Park above Chichester, looking across the countryside, you see a mosaic of woods, fields and settlements. The landscape feels timeless and unchanging, but of course there are traces of the past, and evidence of change, all around us.

Many of these modern woods, parklands and estates are ancient in their own right: a living legacy of the medieval forest of Arundel. This vast medieval landholding fragmented into a number of estates that continue to dominate the landscape today. But hidden beneath these woods are traces of even more ancient places.

The LiDAR survey of the High Woods is bringing a hidden world of life and death, of agriculture and burial practice, to light. Working closely with landowners, the project has been able to arrange access to many private landscapes. A range of LiDAR models has been utilised by project volunteers to explore and record many exciting new features. Whilst there has been a long history of research within the area, the survey data have confirmed what has been long suspected – that there are many more archaeological sites just waiting to be discovered!

APPROACH

The LiDAR data were processed to create highly detailed models of the ground surface. These contain a huge amount of information and can include a wide and perplexing range of features. The traces of thousands of years of human activity are complex and often difficult to unravel. All the humps and bumps depicted in the models could represent a wide assortment of features of different periods, such as boundaries, enclosures, settlements, quarries and trackways, to name just a few. The variety is huge, and interpreting them is made even more difficult by the fact that many of these features overlap, criss-cross and can be refashioned, incorporated or erased by later earthworks.

The LiDAR survey has demonstrated significant survival of the archaeological topography. So much information was present that a National Mapping Programme (NMP) by Historic England was requested to help us start to quantify the extent and the different types of feature present (Chapter 4). This was undertaken by professional teams with specialist knowledge of mapping landscapes using aerial survey. But this mapping would, by necessity, be carried out remotely. We wanted to find a method by which our volunteer fieldwork programme could provide useful data to support the NMP. And that meant going out in the field, and under the trees!

A rapid field survey methodology was devised. The LiDAR models were used to identify interesting features, which were then visited and recorded by project volunteers. However, how do we record and interpret the monuments we encounter? The LiDAR models may tell you that 'something is there', but they don't tell you what it is, or how old it might be. In the absence of excavated and scientifically

Having LiDAR images and maps available on mobile devices makes archaeological fieldwork a lot easier.

obtained dating evidence, the evaluation of archaeological features is fraught with difficulty.

The process of interpretation is ultimately based on experience, judgement and an informed knowledge base. Good observation skills and a self-critical approach are also essential. Understanding of a site-type can often be achieved only by reference to comparable monuments, particularly excavated and dated examples, to help us with interpretations and possible dates. Wide background reading is essential, as is the ability to challenge constructively received wisdom about categories of sites. An interesting aspect of this process in our fieldwork teams was that we often had a wide range of people, with different backgrounds, contributing to the discussions. Debate out in the field was often lively, with new perspectives bringing novel insights. Sometimes arguments raged about whether a feature should be considered archaeology at all!

Background research is fundamental in archaeology. Are there, for example, historic maps, photographic sources, documents or existing records that could help us develop and refine our interpretations? A selection of resources, including existing Historic Environment Records, was provided for every session out in the field, and a member of the project staff accompanied each group to provide support and guidance and to help stimulate discussion.

The interpretation of archaeological topography using non-intrusive methods (i.e. without excavation) is challenging. But it doesn't mean we shouldn't try! Volunteers develop experience as they carry out surveys. As more sites are visited their depth of knowledge deepens, and they develop confidence and get a 'feel' for the landscape. Interpretations are based upon open discussion, research into comparable sites and experience built up over the months of fieldwork. Our interpretations remain that – our best guess about the function and date of features. Skills can be learnt, practised and honed, but the learning process never stops.

METHODOLOGY

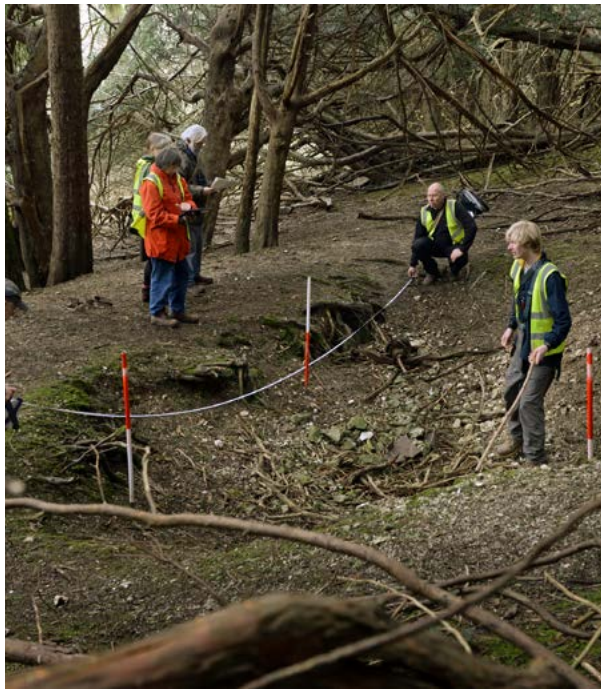
Whilst acknowledging that much interpretation is subjective and personal, there are methods for focusing and guiding interpretation. A first priority was to provide a range of resources for volunteer use out in the field. A specially designed recording system was developed that provided access to a selection of digital materials, including LiDAR data, satellite imagery, historic cartography and the NMP records, by way of a computer tablet.

A digital recording form was then developed to collect a systematic set of data. By prompting our volunteers to ask a range of questions we hoped that people would get into the habit of thinking about archaeological features in a consistent way. We encouraged our volunteers to consider parameters such as environmental context, topography, the condition of monuments and relationships between features, and to provide interpretation and estimation of period and age.
More than 550 records were eventually completed by volunteers. These were downloaded to our central database, therefore becoming available to the NMP teams.

The High Woods community-based project is part of a long history of archaeological exploration and research focused on the South Downs. The data have proved to be both a great tool for community participation and a non-intrusive method of exploring the prehistoric and historic landscapes of the Park – moving away from single site-focused excavations to developing an understanding of the wider landscape context. As well as engaging people with our cultural heritage, this process of rapid field survey has been found to be particularly useful in characterising discrete monument forms often difficult to characterise remotely, such as pits, quarries, ponds, craters and terraces.

We delight in the fact that a nationally important archaeological landscape has been revealed – one that is remarkable not just for the coherence, extent and quantity of the archaeological remains but also because of the levels of preservation that have been identified. The historic legacy of woodland management within the central downs appears to have played a very significant role in protecting these vulnerable monuments from the damaging effects of the plough. However, we cannot be complacent. Whilst much woodland management to date has been low impact, we cannot assume that, with changing management practices and new technologies, this will necessarily remain the case.

The volunteer fieldwork programme has contributed towards raising awareness of the importance of these past landscapes. We hope that this region will continue to be a major research focus for decades to come. Our volunteers can look forward to many more lively on-site discussions and many more days out in the field.



The art of finding an archaeological site in the field is to spot an obvious disturbance to the natural ground surface. Here volunteers measure up a pit-like feature at Kingley Vale.

Caroline Adams talks about archival research.

8

AN ARCHIVES CONSULTANT'S VIEW

CAROLINE ADAMS

ONE OF THE BEST THINGS ABOUT ARCHIVES IS THAT THEY ARE ABOUT PEOPLE – both the researchers in the present and the men and women who wrote or handled the document you are looking at. It is the interplay of the present and the past that makes the study of documentary evidence so rewarding. Let me give you an example.

It is a Wednesday morning and up to fifteen people are crammed into the record office work room in Chichester. Each volunteer has a story to tell about their progress on their own area of study, and the others listen intently because there is so much connectedness between each experience. Ideas fly back and forward across the room, and the conversation ebbs and flows between the Iron Age earthworks at Arundel (are they shown on the 1590s map?) through racing and stables (it wasn't only Goodwood) along the south side of the slopes to the Canadian Battle School around the Stansted area. The LiDAR survey is the common factor in each of the areas of study.

I have loved these meetings. There are very few areas of research more rewarding than being able to compare letters, deeds and other documents that give landscape information with maps dating from the 1590s, the 18th century or the 1940s, and then looking at the LiDAR imagery, going out to walk the area (or carrying out ground-truthing, as it is known), and returning to search for answers to the new questions raised. But it's even better being the research consultant!

I joined the project as a consultant on the advisory committee when I was still working as Senior Archivist at West Sussex Record Office. My working life has been in outreach, and I really enjoy introducing people to the archives of their area or their family, and sharing their excitement at what they find. I was very pleased to be asked to be the consultant for the documentary research.

The contents of the cloth bags in the foreground are weights to hold down, gently, the corners of maps in the West Sussex Record Office.

I have been amazed and thrilled to see how enthusiastic people can be and how much time the volunteers are prepared to give. Most of the work has taken place in West Sussex Record Office and Arundel Castle Archives – where Rebecca Hughes is the most patient and long-suffering archivist I have ever met – and also at The Keep in Falmer and the National Archives. Intrepid volunteers have braved the battery of 'dos and don't's' required at any archives repository (for, unlike books, these documents are completely unique and irreplaceable, and therefore security is high) and discovered a world that many of them didn't know existed. From that beginning, they have used the record offices regularly and enthusiastically.

At meetings and training days the archives' volunteers shared their knowledge openly and discussed each other's viewpoints without animosity. Some had become obsessive over faint lines on the LiDAR images, pits or lumps in the ground or ambiguous words in estate deeds and accounts in the archives. Everyone was prepared to learn a great deal, but nobody got precious over their theories. Many people displayed a passionate knowledge of the locality that I found very moving.

In the end it's down to grounding yourself in the roots of where you live. The sense of satisfaction in having gained a deeper understanding of your surroundings is coupled with the knowledge that you have contributed to and taken part in a much bigger project, and that the work you have done will give other people that satisfaction too. It's about feeling 'a sense of place', and that feeling is more beneficial than any amount of prescriptions from the doctor.

Read the stories that have been uncovered through archival research.

Caroline Adams and Arundel Castle archivist Rebecca Hughes point out something of interest to a volunteer in the archives of Arundel Castle.

Kathy Azopardi, project volunteer, talks about oral history.

9

STORIES OF THE HIGH WOODS

GILLIAN EDOM

ORAL HISTORY IS A TOOL BY WHICH WE ARE ABLE TO CAPTURE THE MEMORIES, EXPERIENCES AND OPINIONS OF THOSE LIVING IN THE PRESENT AND PRESERVE THEM INDEFINITELY. We tend to think of history as belonging to the distant past and forget that it is shaped in the present and that the lives we live now will be the history of the future. Oral history gives us the opportunity to launch into the unknown, to become explorers of other people's lives, and there is no knowing what we might discover when we step out on this journey of exploration.

The Secrets of the High Woods project was set up to investigate and understand how people lived and worked on the South Downs from the earliest of times until the present day. This was achieved through LiDAR surveys, archaeological investigations and documentary research, and by asking people still living today to recount their own memories and stories, and even what they predict or hope for the future.

It seems a relatively straightforward process to ask someone a few questions about their life and capture their answers on a machine, but ask the project volunteers what they thought and their replies would be 'It's not as easy as it's made out to be' or 'I had not appreciated how skilful the role of a good interviewer was.' The acquisition of new skills and knowledge is something I know all of them have benefited from by volunteering for the project.

But there is more: the opportunity and privilege to be able to share in another human life for just a short while. Every life is unique and valuable and our aim has been to capture memories and experiences that will enhance our understanding of how people have interacted with the downs and its landscape in the more recent past. The volunteers have really taken this to heart and frequently mentioned how inspired they have felt. For example, 'What I feel quite strongly about is that, if these interviews aren't done now, a very important part of local history could be gone without realising it. These interviews bring things to life in a way that reading a book doesn't.'

> … forestry's not about trees, it's about people … and in my experience they have always been good people. They're earthed if you like. And it's very enjoyable to work with people who are earthed and there's nothing fancy about them. They're just straightforward people.
>
> Tom Compton

The seventeen volunteers who have taken part in the Oral History side of the project have been highly committed and have produced a collection of fifty fascinating interviews that show how living and working on the downs has changed from the middle of the 20th century to the present day. Their dedication has been outstanding and several of them intend to use their skills beyond the life of the project. One said, 'Oral history is now

something I feel passionate about and so hope my journey can continue.'

The people interviewed during the course of the project were chosen because of their strong connection with the South Downs. They include woodsmen, gamekeepers, coppicers, charcoal burners, woodland and estate managers, farmers, nature wardens, those who handle or work with wood, local residents, archaeologists and those responsible for preserving the heritage of the downs. Woodland work is traditionally male-dominated and most of our female interviewees are those who grew up in the local communities or married into them. Their descriptions are fascinating and illustrate the difficulties that women, in particular, had to overcome in the past to make life comfortable, especially when everyday facilities were so basic and local supplies few and far between. We were delighted, however, to be able to interview some women who work in the woods on an equal footing with men. What an inspiration to listen to their accounts!

'Relationships' is a word that is woven through most of the interviews: the relationship between the woodland worker and the environment. The people who have spent most of their lives working in the woods developed such an intimate knowledge and connection with them that they seemed to have become part of the woods themselves, or had the woods become part of them? Several of our interviewees spoke knowledgeably and affectionately about working with the seasons, the diversity of the trees, the wildlife and the

John Potter, Goodwood Estate, interviewed by a volunteer for the Oral History part of the project, at a coffee morning in East Dean, West Sussex in 2015.

Then and now. David Botting, retired gamekeeper for the Goodwood and Cowdray estates, interviewee for the Oral History part of the project, photographed at his home in Midhurst. He proudly holds a picture of himself as a younger forester.

sensitive management of the landscape. Sadly there appears to be a growing disconnect with the environment owing to the ever increasing use of large-scale machinery and short-term work practices. The symbiosis between human beings and the natural environment may not be what it once was.

I just love the woods. I'm not anti-social as such, but I could work for months on my own and never see a soul and it wouldn't worry me.
Gordon Long

We also learnt about the changing relationship between the large estates, their employees and the local communities. The social divide between these groups has diminished and a greater mutual respect has developed. Local villages are no longer dependent on the estates to provide employment for their communities and rural living attracts new residents from different social groups.

Those who still depend on the woodland for their income spoke about the struggle to make a living in the face of cheaper foreign imports and our preference for more disposable products. The skills and knowledge of these woodsmen and the relationships they have with their crafts have been developed and honed for thousands of years. We should value and preserve them before they are lost forever.

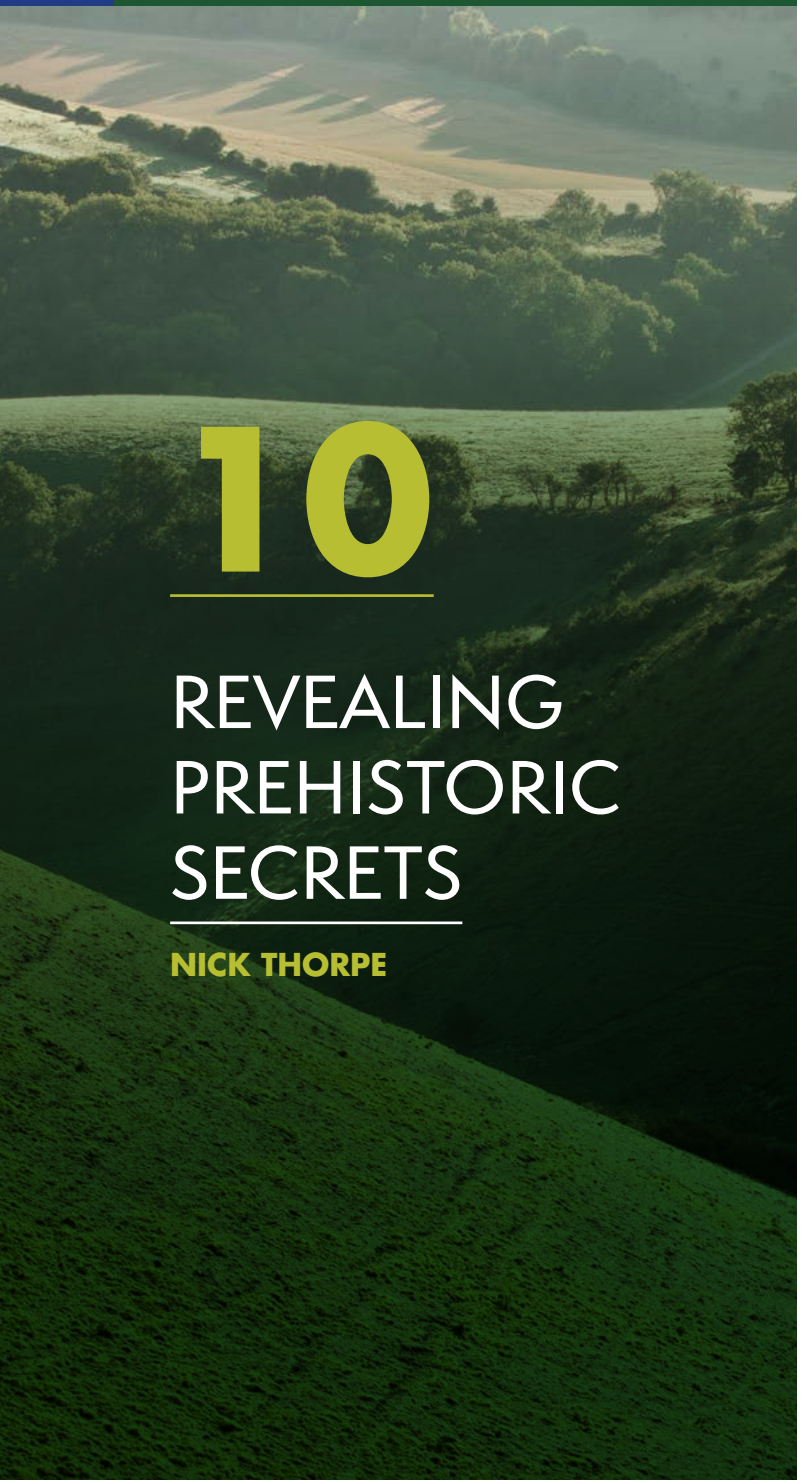
Rosie Rendell, woodworker and interviewee for the Oral History part of the project, coppicing on the West Dean Estate in January 2016.

What all interviewees had in common was their love for the South Downs: the beauty of the landscape and its rich heritage. For those who lived in the local villages there was a real sense of community. Those who worked in the woods and the surrounding environment spoke of the interdependence of woodland workers and the support they gave to one another.

The success of this part of the project cannot be overstated and its legacy is a rich and inspiring collection of personal testimony that will benefit future generations. We learnt so much about how things have changed and what has endured.

I played in these woods and I worked some of them and I worked all the land and worked with the people that were here then, so to me it's part of me.
Adrian Hill

PART 3: PROJECT TEXTS



10

REVEALING PREHISTORIC SECRETS

NICK THORPE

THE SUSSEX DOWNS HAVE LONG BEEN FAMOUS TO PREHISTORIANS SUCH AS MYSELF. Britain's earliest major industrial sites and oldest monuments are found here, dating back to around 4000 BC (in the Neolithic), followed by Bronze Age barrows (burial sites) and Iron Age hillforts; but these well-known sites are often small islands of knowledge in a sea of ignorance. The great advance provided by the Secrets of the High Woods project is to enable us to start to place these key sites in their contemporary landscape.

Nationally important Neolithic monuments in the project area include sites such as The Trundle causewayed camp, the Stoke Down flint mines and the long and oval barrows at Stoughton Down. As yet, we cannot add much to our understanding of these sites from the LiDAR results, and indeed we have little knowledge generally of Neolithic settlement, and no examples of Neolithic houses in Sussex. On the other hand, Neolithic fields are known in Ireland, so it is possible that some of the examples the project has located may be that old. From a later date (after 2000 BC) there are many fine cemeteries of earlier Bronze Age round barrows, such as the Devil's Jumps, but again we wait to see if elements of the everyday landscape in which they were situated can be located through the project.

So we cannot yet say much that is specific about the Neolithic or the earlier Bronze Age periods. However, as prehistorians we take a long view. So one question we are interested in is how these ancient sites were viewed from later prehistoric times onwards. Were they ignored, set aside as sacred land, used as landmarks or even incorporated into fields? At the Devil's Humps on Bow Hill (not to be confused with the similarly named Devil's Jumps on Treyford Hill) we can now see in great detail how a variety of boundaries and trackways run up to and beyond the barrows – working out when these were constructed would tell us something important about how the past was used in the past.

> You have a landscape and it's got a few lumps and bumps on it and you know that embedded in that landscape is information about the past, information about people, information about their history, their lifestyles and everything, and if you're interested in that and if you're curious an excavation is a way of discovering all those things … . ways; that it's a person that has secrets and you have to get to know that person for those secrets to emerge.
>
> Barry Cunliffe

One of my own research interests is the development of warfare (conflict between groups) in Europe, particularly Britain. A constant question for those of us studying ancient warfare is: what were people actually fighting about? One of the possible answers is access to land, and the later part of the Bronze Age across much of Britain sees the construction of both some very long (several

miles) major boundaries and some very large groups of fields, maybe sometimes created in a single operation (suggesting someone was in charge). The key problem with trying to combine this evidence of landscape division into a coherent whole is that we are looking at disconnected fragments found through the examination of aerial photographs, and excavations can only give a date to these fragments. The crucial breakthrough offered by the Secrets of the High Woods is that we can now begin to join these dated fragments together by filling in the gaps previously hidden under the modern-day woodland.

The later Bronze Age also sees the appearance of the earliest actual weapons (in the sense of objects which can be used only as weapons), many found in hoards in pits. It has always been very hard to see how these finds relate to the wider landscape, but with the LiDAR results we should be able to see whether these are well away from settlement and agricultural activities or occur round the edges of these. Finally, the earliest hillforts also date to the Bronze Age. One of the big questions with hillforts is how far they were, from the start, defended settlements dominating the landscape around them. If they had this function from the beginning then we should see a landscape of fields laid out around them which could be controlled by the hillfort dwellers.

In the Iron Age we have plenty of hillforts, some of them very large and many, such as Goosehill Camp, seeming to dominate the land below the downs. Some of the fields laid out in the Bronze Age, however, appear on

These innocuous grass-covered depressions at Long Down, north-east of Chichester, cover the filled-in shafts of 6000-year-old flint mines.

One of the Bronze Age barrows forming the Devil's Humps on Bow Hill, near Kingley Vale. Not to be confused with the Devil's Jumps on the northern edge of the South Downs near Treyford.

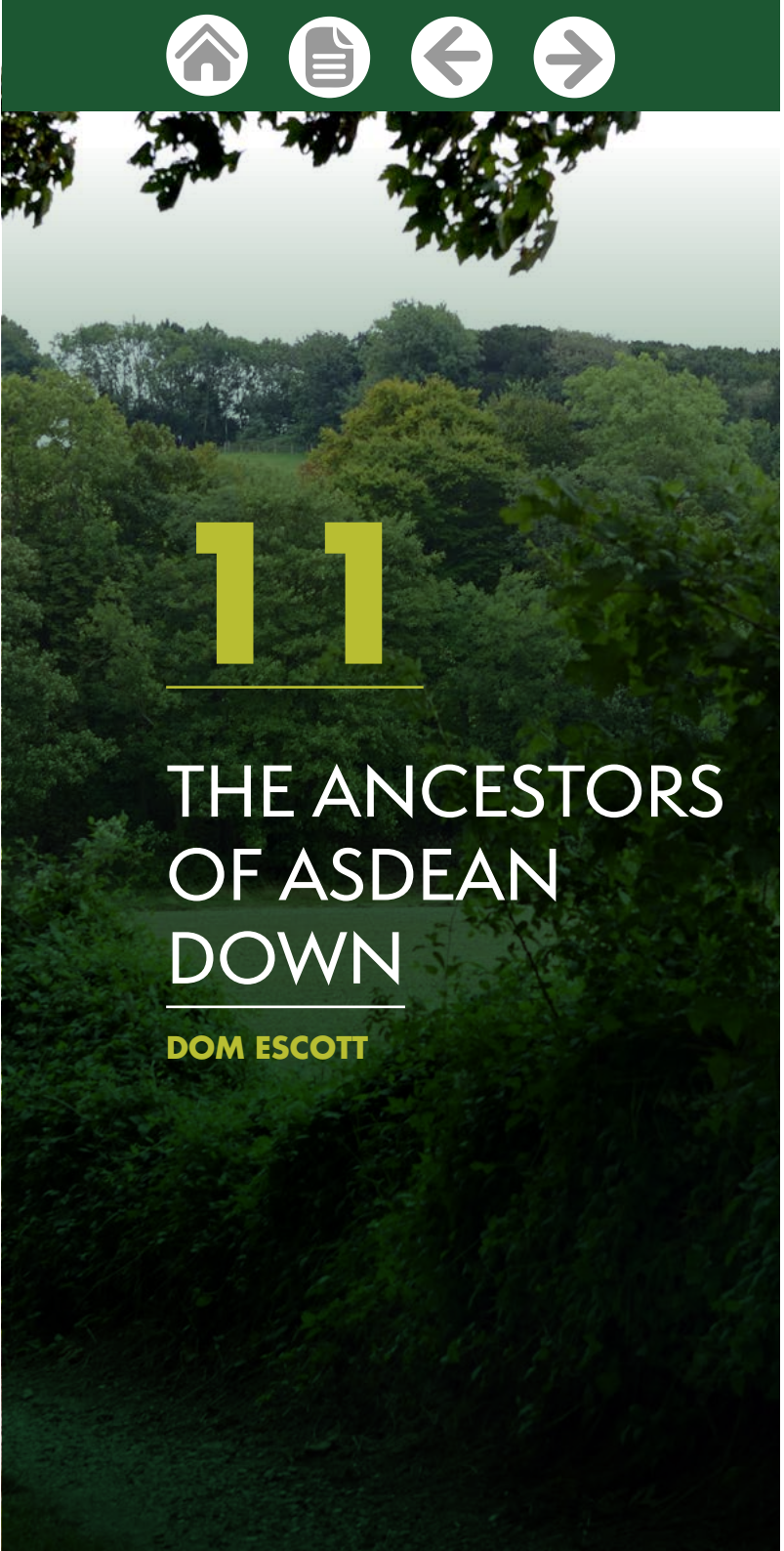
the basis of lots of small keyhole observations from archaeological excavations, to go out of use. What we cannot say yet is whether this is a general pattern, or if areas of fields near to hillforts continued to be farmed. Again, the much better mapping of field systems we can now produce will help to answer this.

Of course, I mainly think of the High Woods in terms of the extremely rich prehistory, but many of the same points about the wider landscape can be made about later periods. In Roman Sussex we know a lot about towns such as Chichester, and villas such as Bignor, but our knowledge of the countryside on which they depended and the network of roads and tracks which would be used to move people and goods is really very thin. What doesn't seem to happen, as far as we can see at the moment from the LiDAR imagery, is a major reorganisation of the agricultural landscape of fields. Perhaps, as an occupying power, the Romans were happy enough if taxes in the form of grain kept coming in, so mainly left things as they were. They certainly had a big army that needed feeding.

When towns appear again in the later Anglo-Saxon period we still do not have a good archaeological idea of how the countryside worked, and so probably rely too much on the written sources. More surprisingly, given our usual understanding of large-scale population movement, there, again, seems to be little change in the rural landscape. Maybe, in the countryside, there was more continuity than we normally assume. Later on, under the Normans, we do see a real shift in the way the land was used. This was away from agriculture, as the Norman lords used large parts of their estates, which were their reward for supporting William the Conqueror, for hunting deer. This meant the creation of deer parks, involving both the construction of boundaries that cut across field systems which may have been there for 2000 years by that time and the planting of trees to provide good browsing and cover for deer. The country estates that then evolved from these lordly landholdings also often preferred woodland to crops as more pleasing to the eye, at least to the owners. So the tree-covered landscape which gives the project its name is probably, to the prehistorian at least, a recent development.

Known locally as Bevis's Thumb, this long barrow lies near the village of Compton. It's likely to be over 5000 years old and probably covers the burials of some of the first downland farmers.

All in all, therefore, the results of the Secrets of the High Woods project have opened up the woodland of the down to such an extent that we now have a chance to answer some of these big questions about the landscape of the past. I think that, in the next few years, decades even, as research projects take place, there will be some real breakthroughs in our knowledge of the landscapes of the High Woods. I am sure they will become even more famous – and not just to prehistorians!



11

THE ANCESTORS OF ASDEAN DOWN

DOM ESCOTT

THE DEVIL'S HUMPS ON THE SUMMIT OF BOW HILL IN THE KINGLEY VALE NATURE RESERVE are regarded as some of the finest examples of Bronze Age burial mounds (or barrows) in the south-east and are a popular destination for ramblers, hikers, bikers and visitors to the National Park. Such mounds were probably reserved for special people in the Bronze Age, such as priests, chiefs or warriors. These people became the ancestors, and the ancestors watched over the living.

Yet, not far to the west on the next down, overlooking the tranquil village of Stoughton, is an ancient monument, perhaps unique in its design, hidden under impregnable brambles, thick undergrowth and a blanket of dense yew trees. An unofficial footpath passes just below. But the majority of passers-by will be totally unaware of the monument, or at best make out obscure and curious silhouettes against the down's hilltop.

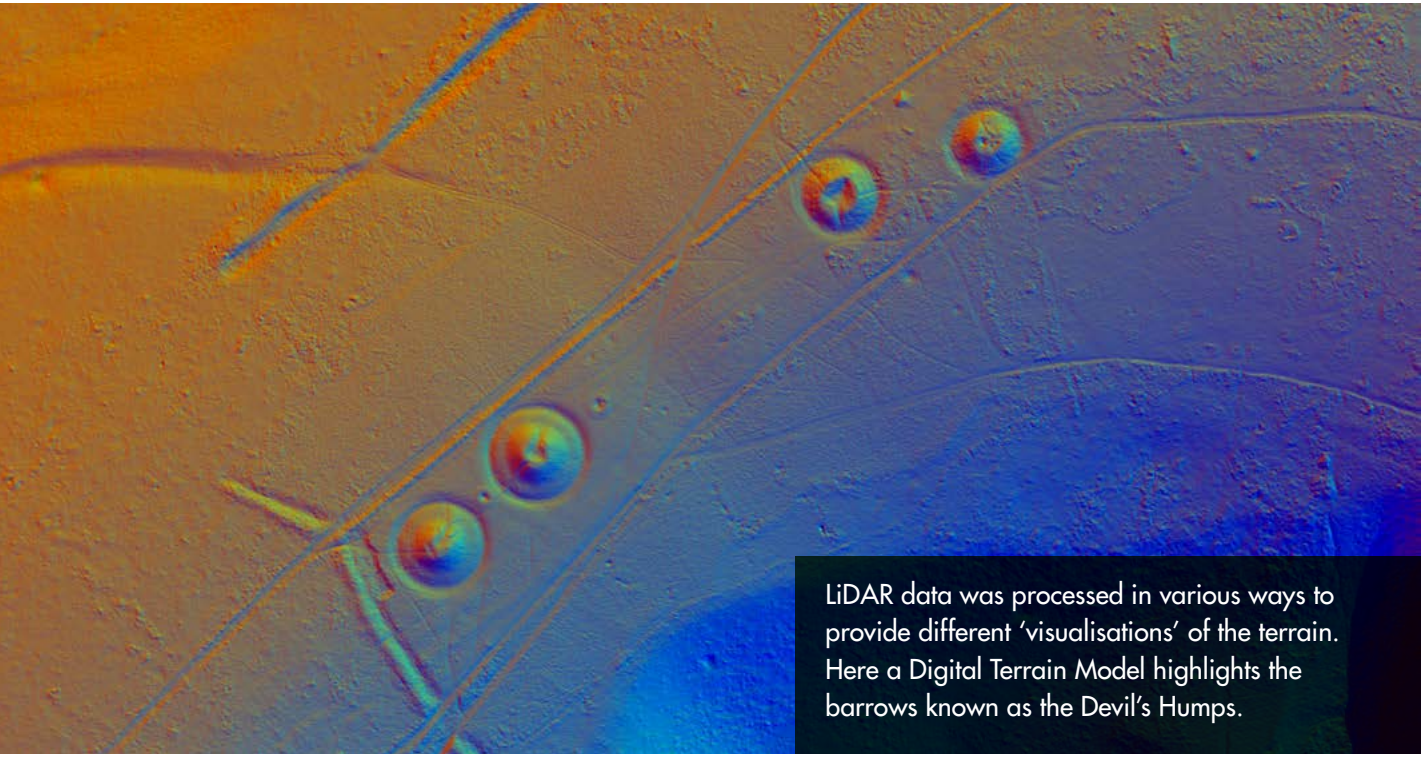
There are several different types of barrows, the most common being a mound that looks like an upturned dessert bowl, hence the label 'bowl barrow'. These are generally constructed by digging a circular ditch and throwing the material into the centre or by scraping up the surrounding terrain to form a central mound. There are other forms, but one that is regarded as 'special' is the 'bell barrow'. The central mound of such barrows extends out into a sloping platform, or berm, before reaching the surrounding circular ditch. The two westernmost barrows on Kingley Vale are perfect examples of this type.

A word of archaeological caution is needed here. Bowl and bell barrows are terms invented by archaeologists. We have no way of knowing whether in the remote past a similar distinction was made by the people who made these mounds. Bell barrows might be 'special' in archaeological terms, but whether they were special in prehistory is unknown.

> Place-names can influence the development of a story. The burial mounds are said, aren't they, to be the burial place of four kings and that must surely be because it's called Kingley Vale?
> Professor Jacqueline Simpson

The bell barrow (or barrows) on Asdean Down is unlike any other of the approximately 250 examples known nationally: it consists of two bell barrows of near uniform dimensions which merge together to form a conjoined or twinned monument. Or, to put it another way, it looks like a single living cell about to divide into two. To add to their uniqueness, the surrounding ditch encircles both barrows to make a single platform for both mounds. It is clear, therefore, that they were probably meant to have this twinned appearance from the outset.

The duality of the bell barrows on Asdean Down might suggest some sort of relationship between the deceased occupants. Could they be members of the same family, or household?



LiDAR data was processed in various ways to provide different 'visualisations' of the terrain. Here a Digital Terrain Model highlights the barrows known as the Devil's Humps.

Or do the two juxtaposed barrows refer to the duality of the sun and the moon, of the day and the night, or of the living and the dead?

Adjacent, and to the right of the linked barrows, is a smaller bowl barrow. Perhaps its proximity suggests some direct relationship of the occupant to those of the linked barrows: a child or sibling perhaps? There is also strong evidence for two bowl barrows nearby. All three form what is categorised archaeologically as a linear cemetery. Sometimes lines of these barrows appear to be aimed at significant celestial occurrences, such as the midsummer or midwinter solstices. It was clearly important for these people to harmonise their lives, and their deaths, with the cycles of the sun and moon.

There are no records of any historical excavation at these sites, and it seems that no professional investigation has taken place either. However, in both summits of the twinned barrows the customary 'craters' of antiquarian investigation can clearly be seen. These began in the Middle Ages and peaked at the turn of the 19th century. Any evidence for what they found is unknown and lost to us.

LiDAR has given us our first glimpse of how spectacular these monuments really are. We can now strip the camouflage of dense undergrowth away, albeit digitally only, and see these conjoined barrows with their outer ditch tightly wrapped around them. As explained in Chapter 3, LiDAR imagery is used to produce spectacular visualisations such as the Digital Terrain Model, formed from the 3D co-ordinate system, or 'point cloud', that is the raw LiDAR data.

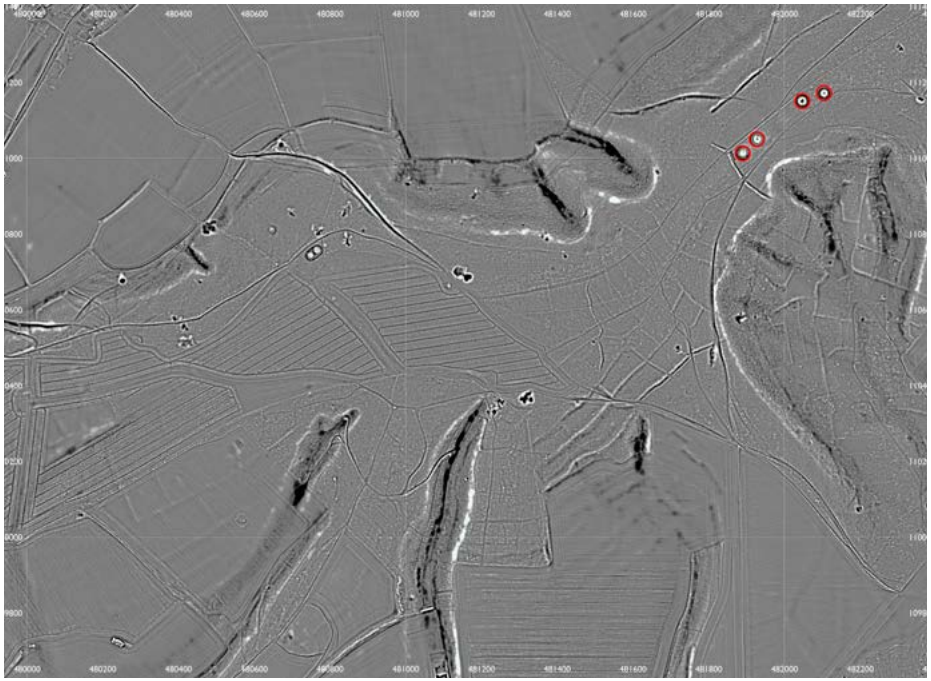
The point cloud for Stoughton Down can be manipulated in several ways. A line can be drawn through it to produce a vertical profile of the area; by computer analysis the ground surface and tree-line can be extracted. Now we can see the profile of the mounds, the antiquarian craters and a stippled outline of the trees and undergrowth that obscure the barrows today. Lastly, the outer ditch can still be seen, although it is heavily infilled today and hard to discern on the ground. LiDAR offers even more possibilities. The data can be manipulated to reveal a pseudo-3D perspective of the twinned barrows and, finally, a magnificent visualisation that allows us to glimpse finally what is hidden. Now we know, of course, that all this data manipulation is what computers do best. But watching these hidden features appear on the screen still feels quite magical.

Whilst in itself this twinned barrow is exciting, it should not be considered in isolation. A map of all the local barrows demonstrates that the now-dry valley running between Bow Hill and Stoughton Down was in fact a massive Bronze Age cemetery. Our twinned barrow and the two barrows opposite at the edge of Inholmes Wood (to the north of Stoughton) actually stand almost as portal

guardians of a sacred area that could have been devoted exclusively to the dead. The ancestors must have been really important to the living. The valley also contains two rare Neolithic oval barrows, hinting at the area's ritual significance well before the Bronze Age.

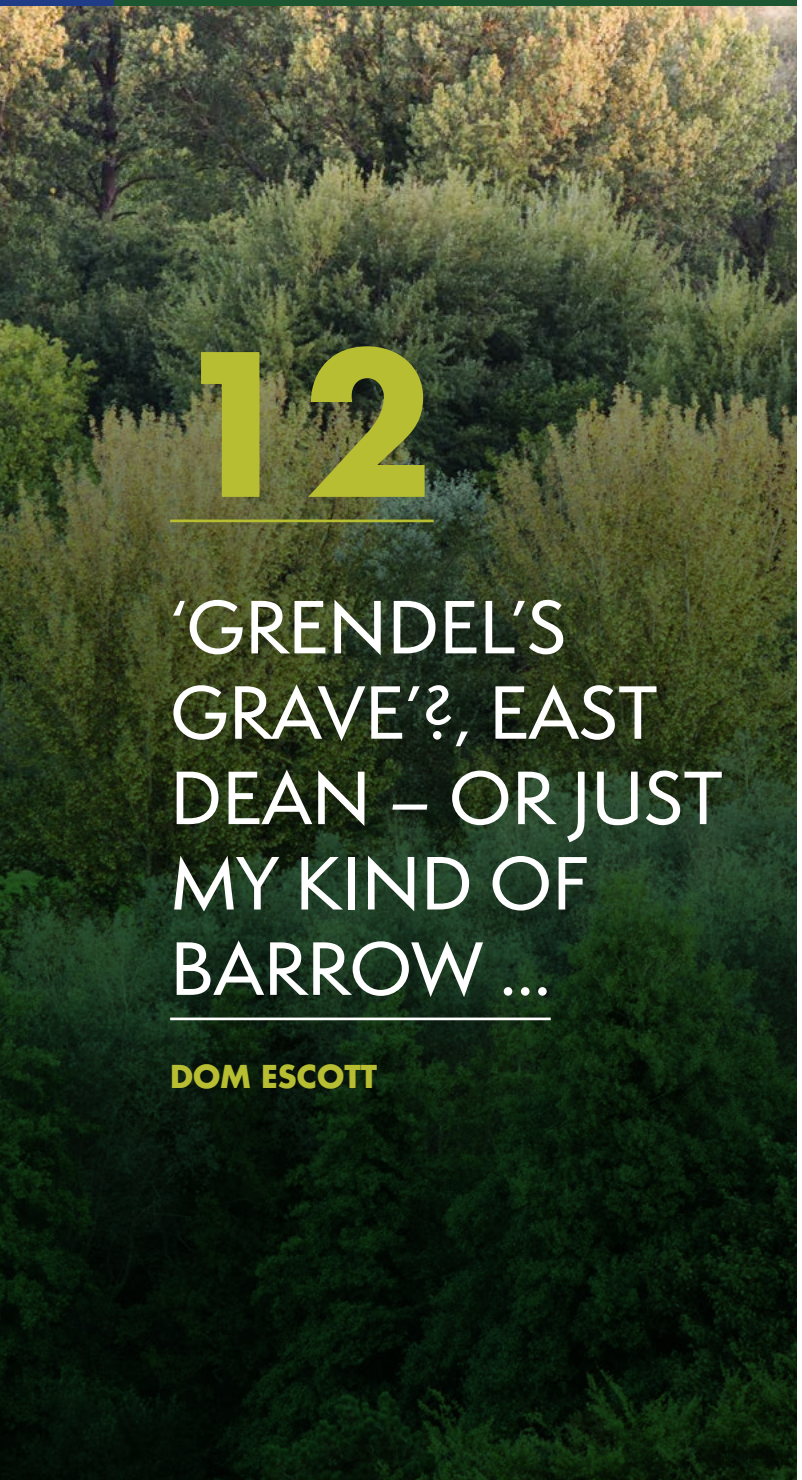
Perhaps next time, when you have had your fill of the spectacular viewpoints from the Devil's Humps, and those stunning views of the surrounding National Park and coastal plain, linger a little longer. You could prolong the Kingley Vale nature trail by branching off to the west and discovering for yourself this special landscape. Take a moment to ponder what the people in the Bronze Age thought of those views. Did they appreciate them in the same way you do, for the same reasons? Or were these special views reserved for their ancestors, those people under the barrows? Archaeology can't provide all the answers. But one thing is for sure. By walking a little further you will most definitely be rewarded with a spectacular view of the Stoughton valley, even if the twinned barrows remain hidden. You might not see them, but those ancestors are still watching.

Treasure, graves and possibly fairies
are the main things we get in barrows.
I suppose you might get the odd ghost.
You can get ghosts practically anywhere.
I think treasure is the likeliest one in
Sussex.
Professor Jacqueline Simpson



A LiDAR image of the barrows on Asdean Down. Note the four prominent barrows known as the Devil's Humps marked by circles in the top-right of the image. The conjoined or twinned barrows appear centre-left, immediately below a curving track or earthwork.

Partial view of the twinned barrows on Asdean Down near Stoughton. They are very difficult to spot in the woodland understorey.



12

‘GRENDEL’S GRAVE’?, EAST DEAN – OR JUST MY KIND OF BARROW ...

DOM ESCOTT

ONE OF THE MOST EXCITING POSSIBILITIES OFFERED BY THE SECRETS OF THE HIGH WOODS LIDAR is the discovery of monuments and features that have gone unrecorded for hundreds of years. The South Downs host a multitude of tumuli or barrows – Bronze Age burial mounds, the most famous in our region being the Devil’s Jumps on Treyford Hill and the confusingly similarly named Devil’s Humps in Kingley Vale on Bow Hill. They probably mark the graves of important people – elders, priests, chiefs, warriors, craftworkers – who knows?

These barrows usually sit close to the summits of the downland slopes on false crests and ridges and would have looked dazzlingly white when the chalk mounds were freshly constructed. In addition to their location with respect to height, another general truism is that barrows can sometimes be located on lower ground, on the central arc of a hill’s spur. These particular locations in the High Woods are often obscured by woods and forests.

During the field surveying sessions at East Dean, a specialist in Scandinavian rock art and professional archaeologist and regular volunteer, James Dodd, spotted a tell-tale feature showing up in the LiDAR imaging. It consisted of a raised circular feature. Naturally this needed to be investigated and verified – especially as it had, as yet, not been identified in the National Mapping Programme and so was therefore unrecorded!

Interpretation of a feature can be very difficult and particularly subjective; one individual may see one thing and another be decidedly dubious. This feature is one such example: on the ground it was greatly obscured by the dense ash woodland and almost invisible to the eye. Indeed, the qualified archaeologist leading the volunteers this time was extremely sceptical, but a field survey computer record was taken nevertheless. To the untrained eye nothing is particularly discernible at the site, although I was of the other persuasion and was convinced it was indeed a barrow.

Volunteer James Dodd, using LiDAR data and maps during a field survey at Stansted Park. Having the ability to access digital data in the field via a computer tablet has revolutionised the methodology of field surveys.

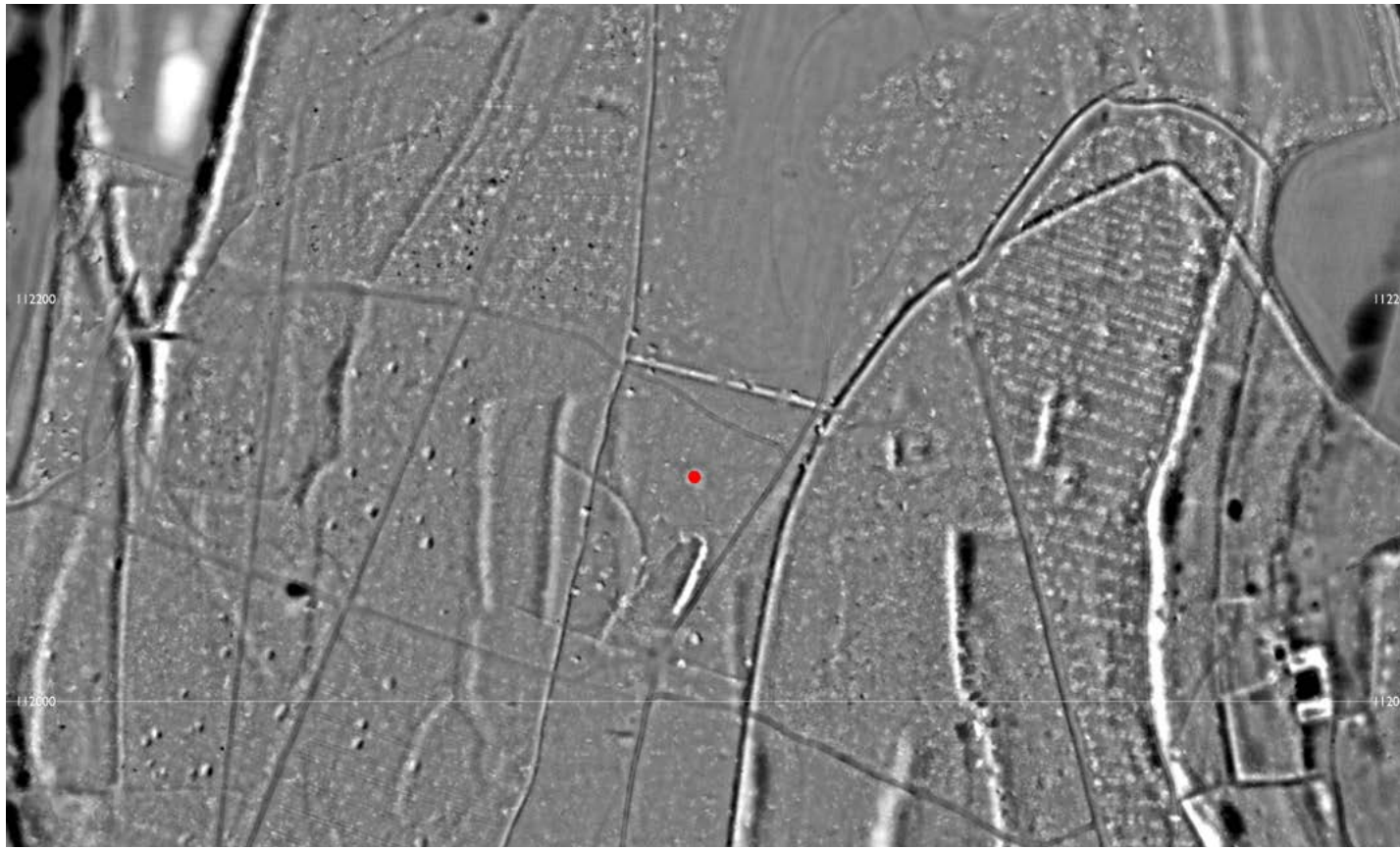
Several months later the volunteers and leaders of the High Woods had returned to the East Dean deer park to film some interviews and footage for the exhibition. Along with the regular team leaders and volunteers, we were joined for interviewing by prominent archaeologists Mark Roberts (from UCL and Boxgrove Man fame) and the High Woods region's Archaeology Officer, James Kenny.

> It's the woodland that's preserved all these sites. It's the woodland that hides it and presents this wonderful opportunity to have that sort of 'Aha' moment when you wander through and see something new. I've been with people who've discovered new barrows and burial mounds ... It's all remarkable and interesting stuff.
>
> James Kenny

Now the annoying thing about filming is that you spend a significant amount of time standing around, waiting to be filmed or interviewed. Filming sounds a bit glamorous, but the reality is much duller. Later in the afternoon, whilst chatting to James Kenny, it became apparent that we had the time to visit some other features we might have identified. James challenged me to 'show him something new'. How could I resist?

This was the perfect opportunity, as our possible barrow was less than 100 metres from the filming location – this was my big chance for an authoritative interpretation! Upon arrival at the feature we found, to my surprise, that the trees had been cleared from the site and a glade of foxgloves and reed grasses had sprung up in the meantime. But they looked definitely as if they were growing on a slight mound.

'Well, it's a barrow', stated James, and I was elated – another definite barrow monument found exclusively by the LiDAR! This poor barrow had undoubtedly been reduced in height by ploughing in the past and overall



A red dot marks the location of 'Grendel's Grave' on the LiDAR imagery. An archaeologist can hazard a guess at many LiDAR anomalies, and this time the guess proved right – it was a barrow!

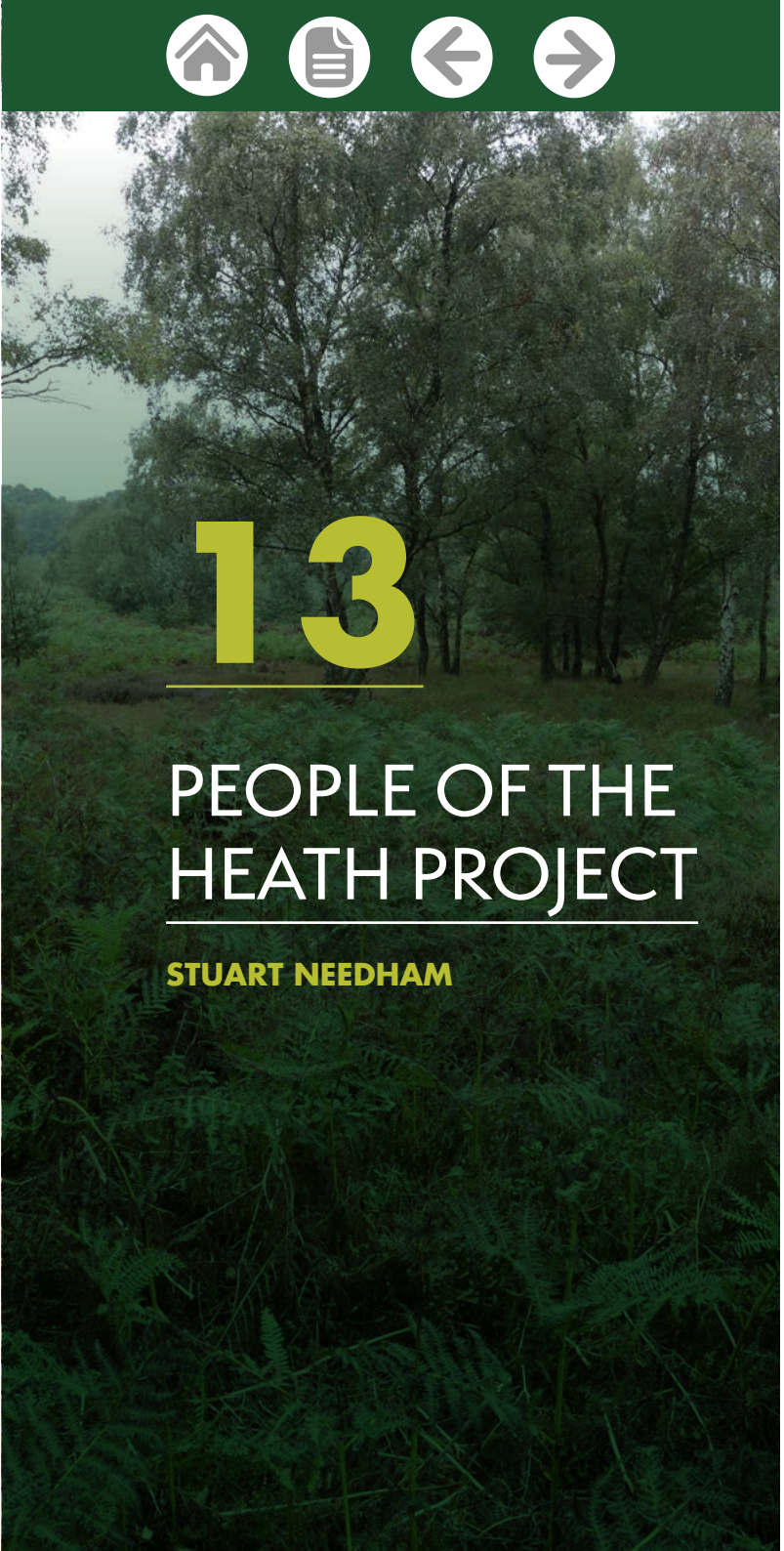
An aerial view of the barrow now known as 'Grendel's Grave' in East Dean Woods.

was not in a good state of preservation. No matter! It was new and it was mine!

James then informed me that apparently there is a tradition amongst archaeologists: you are permitted to name your discovery after some mythical creature. Really? I must admit that this was news to me but I wasn't about to contradict him. As James Dodd, not myself, had originally identified the feature, I felt the creature should surely be Grendel, from the poem *Beowulf*, to respect his Danish background. Thus, 'Grendel's Grave' barrow was named. I was then informed that this naming had to be confirmed by toasting the barrow with a pint. I did look at James at this point. I couldn't see where his tongue was – perhaps in his cheek? Whatever. In due course my friends at my local did me proud by toasting the new barrow with a loud cheer! Traditions have to start somewhere, don't they?

Interestingly, as I've mentioned before, there are tell-tale clues to the potential siting of tumuli, insomuch as they are often located near the summit or on a spur. This particular barrow is not only some fifteen metres lower than the 168-metre summit, it most definitely lies close to the very apex of the slope's spur. This location is almost impossible to discern by eye, but it is clearly locatable on the Ordnance Survey map's contour line.

Truth to tell, 'Grendel's Grave' isn't the most spectacular Bronze Age round barrow that you could visit. However, should you wish to – well, its tranquillity, its quiet and moody glade, make up in atmosphere what it lacks in height. It is located only thirty metres to the west of the Monarch's Way footpath and a short distance from the Counter's Gate car park. Maybe it's just me, and I'm biased of course, but on a nice day with the light streaming onto the barrow's glade from the surrounding dark woodlands, you might feel a little in awe of the barrow – and then you think about the people millennia ago who venerated this place and … what can I say? I find it a truly beautiful experience. If you are passing – why not give it a try?



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PEOPLE OF THE HEATH PROJECT

STUART NEEDHAM

THE PEOPLE OF THE HEATH PROJECT, run by Petersfield Museum (2014–18), was set up to give a major early Bronze Age barrow cemetery (*c.*2200–1500 BC) on Petersfield Heath its first ever archaeological investigation. A parallel objective is to put this group of monuments into context by looking at the many other barrows in the region. A small team of volunteers has been working steadily to this end during the winter months and will complete the process by 2017. Aside from the records built up by previous researchers, our most valuable source of information is without doubt LiDAR. LiDAR images not only help us discover more potential sites for subsequent ground inspection but are also a considerable aid to understanding how the barrows sit in relation to one another and within their immediate landscapes.

Petersfield Heath lies towards the western end of the valley of the Rother, a small river flowing from springs beneath the Hampshire hangers to a confluence with the River Arun in the east. The valley is of very modest size, yet a number of important barrow cemeteries have survived the passage of time well there owing to the agricultural marginality of the acidic and nutrient-poor sands on which they were sited. These 'heathland' barrows lie beyond the northern limit of the High Woods survey area and LiDAR images have had to be drawn down from the open-access lower-resolution Environment Agency data.

Our interest, however, extends beyond the Rother Valley itself to take in the contrasting environment of the chalk downs to south and west, where barrows again survive in reasonable numbers. For the southern block of downland the High Woods LiDAR is proving to be of considerable assistance.

Bronze Age barrows are most often circular mounds carefully constructed of local materials such as – on the downs – turf and chalk. A minority are, rather, circular enclosures lacking a mound or only having a very minor mound. One important function was to house the dead, but it is likely that they had a much broader ritual role and served to bond local societies together.

Barrows vary enormously in scale. Small size is sometimes a product of progressive reduction by cultivation over many years, but occasionally it is possible to make a case for the small scale being original. It is self-evident that prominent barrows will be the ones most likely to have been spotted by previous generations of fieldworkers and, conversely, that small or very low ones will more likely have been overlooked. This is where high-quality LiDAR really pays dividends, and this can be the case even in areas close to well-known monuments, as I shall illustrate with the regionally celebrated Devil's Jumps group on Treyford Hill.

The 'Jumps' comprises a line of five prominent barrows (nos 2–6; respective heights in metres:2.25, 2.3, 4.0, 4.6 and 3.8), but these are only the most dramatic of a larger cluster of monuments. A sizeable barrow once stood a little to the west (no. 1); it was still three feet (*c.*0.9 metre) high when barrow doyen Leslie Grinsell saw it in about

East-to-west view of the Devil's Jumps on Treyford Hill (a group of five Bronze Age bell barrows). To the right of the image the chalkland drops dramatically away into the lower Weald.

1930, but has since been totally levelled by the plough. One of the smaller mounds (no. 7) was recognised (and dug into) as long ago as the mid-19th century, while nos 8 and then 9 were spotted in more recent times.

When we came to examine the site early in 2016, armed with High Woods LiDAR images, we noticed other apparent small rises in the ground surface that invited investigation. Careful ground inspection suggested that four small mounds should be added to the group (nos 10–13). Varying in diameter from 6.5 metres to 10.5 metres and in height from 0.2 metre to 0.5 metre, these are fairly insignificant mounds. Prior to the woodland edge being taken back to clear the immediate environs of the Jumps, they would have been difficult to spot amongst the trees and undergrowth. Nevertheless, despite the potential for damage from tree roots and wind-felled trees, these little features in the landscape have survived remarkably well. Other hummocks in the ground flanking the south-west of the Jumps are readily dismissed as due to tree-root boles and woodland disturbances.

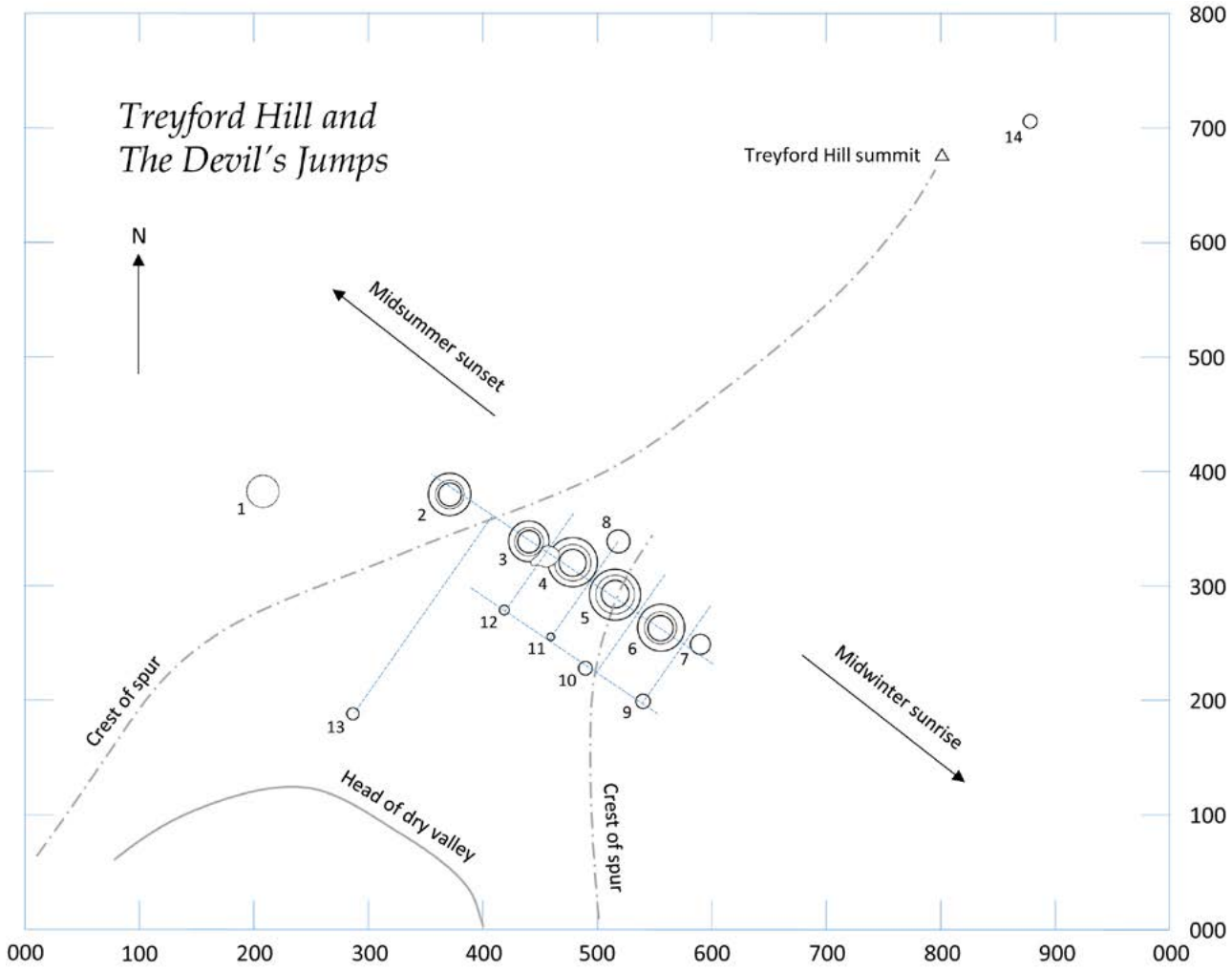
Pieces of highly heat-stressed flint, known generally as 'burnt flint', were also noted on the surface of mounds 11 and 12. Burnt flint is almost always an indicator of prehistoric activity and, in particular, a certain mode of cooking. Large heaps of burnt flint (and elsewhere, burnt stone of other types) could build up on sites used for cooking for prolonged periods, but we should not necessarily apply this explanation to the small mounds on Treyford Hill.

The small mounds, taken together, present a wholly new insight into the structure of the complex. Not only do four of the five form an approximate line parallel with that of the Jumps, but they also seem to be placed in line with the gaps between the main barrows. This pattern looks highly structured, although it may still have developed through 'organic

design'. Past researchers have noted that the Jumps themselves are aligned north-westwards, roughly towards the midsummer sun setting over Beacon Hill, one of the most prominent heights of the South Downs ridgeway. By the same token, in the opposite direction they would point to midwinter sunrise, and this may have been the more important date in the calendar for early farming communities. However, it needs to be appreciated that because the barrows are set out across a well-rounded spur it is not possible to see all five from either end of the line.

Another striking feature of the five Jumps is that they are all very similar in form, each having an encircling ditch separated from the mound base by a narrow sloping berm. This is a form known as a bell barrow, and is not common locally. It would certainly be possible to envisage their construction, or perhaps final modification, over a limited time-span as part of a single plan.

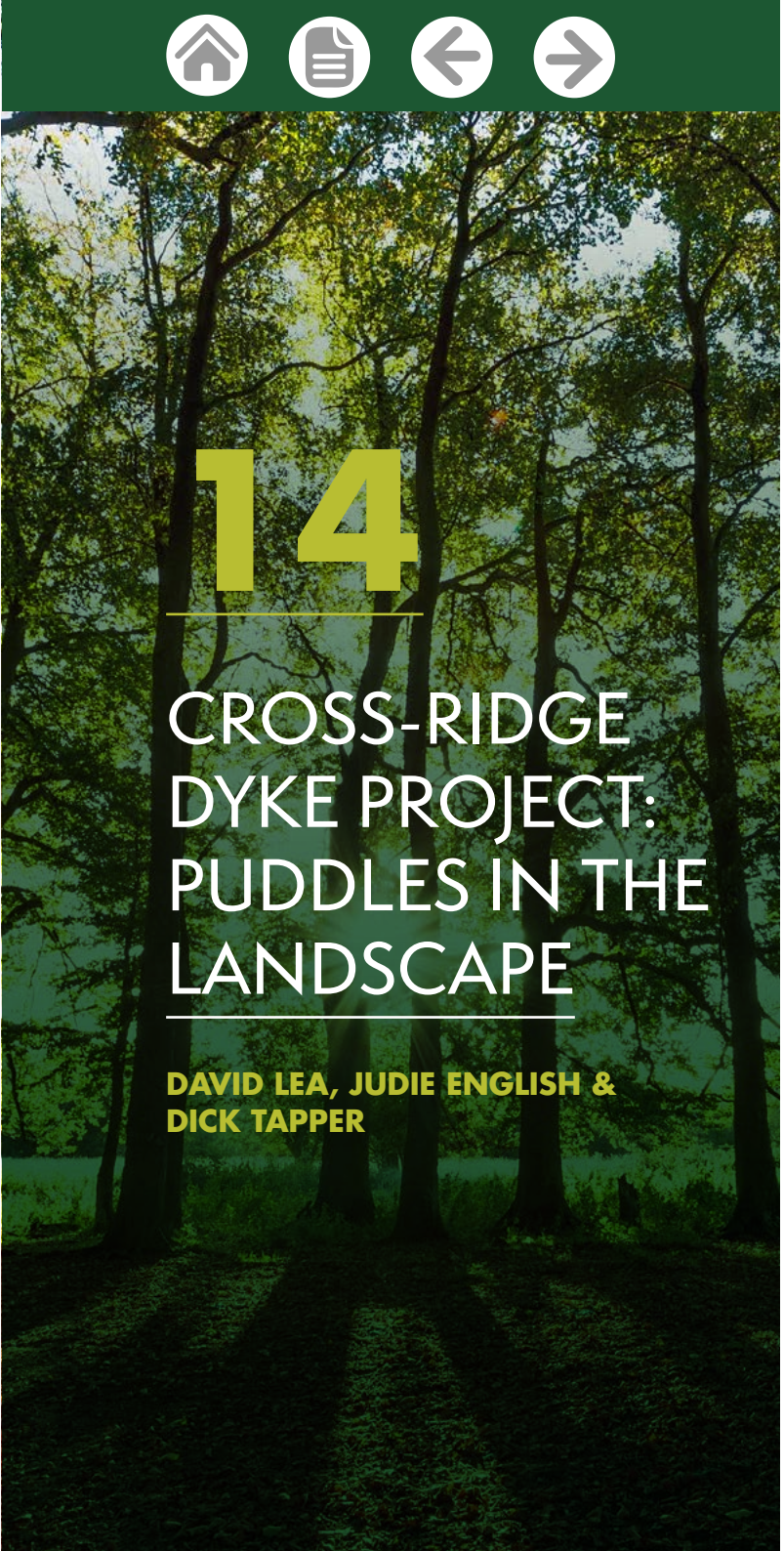
Perhaps of equal significance to its solstice alignments is the topographic setting of this group. It sits astride a gently sloping spur coming south-west off the summit of Treyford Hill, where lies an apparently solitary and modest barrow (no. 14). The land has already dropped fifteen metres from the summit and as it continues to fall the spur quickly gives way to the head of a dry valley running down to Hooksway. In the absence of trees the Devil's Jumps complex would command a fine view down the length of this valley, across the lower downs around the Mardens and beyond towards the coast and the Isle of Wight.



A plan shows the main barrows, and the newly discovered smaller ones, lined up on the axis of the midwinter sunrise and midsummer sunset. Note the location of the barrow cemetery at the head of a dry valley, which lies to the south-west.

A reconstruction of the the Bronze Age bell barrows now known as the Devil's Jumps, near Treyford. The mounds are separated from their encircling ditches by a narrow platform called a berm.

The Devil's Jumps – note the very obvious linear arrangement of the barrows, and the platform or berm upon which each sits.



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CROSS-RIDGE DYKE PROJECT: PUDDLES IN THE LANDSCAPE

DAVID LEA, JUDIE ENGLISH & DICK TAPPER

WHY ARE THERE OCCASIONALLY LARGE PUDDLES ACROSS OTHERWISE DRY PATHS WHEN WE WALK ACROSS THE SOUTH DOWNS? Our project looks at strange features called cross-ridge dykes – ditches with banks alongside.

Where are they found? Many can be found dotted along the length of the downs close to the edge of the scarp slope, running at right angles to that steep slope. Others are found cutting across the short spurs that project out northwards from the ridge or eastwards from the end of the downs at Eastbourne. Yet more cross the spurs that run down from the northern scarp towards the coast.

Who built them and when? This is where the mystery deepens. There is very little positive evidence left behind by the builders, but what there is suggests that they were constructed about 3000 years ago by the people who farmed the downland. Where can they be seen? You pass many cross-ridge dykes when walking along the South Downs Way. Along Heyshott and Graffham Downs (NGR SU897165) you cross two sets of cross-ridge dykes, the easternmost of which has the banks and ditches cutting through a line of prehistoric burial mounds or barrows. But if you want see a large, well-defined cross-ridge dyke that has easy access visit Lamb Hanger. From the car park near Bignor Hill take the path that leads past the radio masts on Glatting Down to Lamb Hanger (NGR SU964133), a distance of 950 metres.

The above two examples of cross-ridge dykes are well known, but the LiDAR survey data made available by the Secrets of the High Woods project have allowed us to find a number of previously unrecognised cross-ridge dykes. Stubbs Wood, Upwaltham (NGR SU947125) is a good example of this, as the LiDAR shows several earthworks of different periods and, most importantly, the relationships, both spatial and chronological, between them.

> On the downs all the lumps and bumps will represent everything that humans have done to the downs from the Neolithic period until probably the Saxon period in this area. So you've got 5000 years of human activity that those bumps represent, so it's a palimpsest of activity; and then the skill is to analyse it in terms of phasing.
>
> Barry Cunliffe

The previously recorded sites in Stubbs Wood comprise three bowl barrows, burial mounds probably dating to the second millennium BC. However, the LiDAR shows that one of the barrows was apparently built on top of a slight bank that forms one side of a rectangular enclosure. On the ground this bank is less than 0.2 metre high, but it is clearly delineated by the moss growing on it. This difference in vegetation must reflect some variation in the soil below and the enclosure may suggest agricultural use of the land before it was selected as a suitable place for the disposal and memorialisation of the dead.

The cross-ridge dyke in Stubbs Wood, Upwaltham, comprises a bank (to the left) and a ditch (to the right). This particular section of dyke seems to have been reused as a parish boundary.

Thus, in this case, the barrow is later (i.e. more recent) than the enclosure.

The LiDAR image shows two other mounds close to the track that have been dug into from the top – a sure sign that someone in the past thought they might indeed be barrows. If they are small, and have a low profile, this might suggest a Saxon, rather than a prehistoric, date for their construction. However, some putative barrows may simply be the result of trees falling and pulling out the root plates, or even remarkably circular animal burrows that could be mistaken for the ditch that often surrounds barrows. In these sorts of cases the only way to be really sure about their date is to carry out an excavation.

Crossing the path up from the A285 road in Stubbs Wood is a bank less than half a high with a ditch on its uphill side. To the north the low, abraded bank reaches as far as the steep side of the spur, but its nature changes south of the path. It becomes 'crisper' – the bank is taller and the ditch better defined, as if it had been dug more recently. After a change in angle and decrease in width its line continues down the southern side of the spur and across the next valley. This probably represents a cross-ridge dyke, between the northern slope and the change in angle, which has been reused south of the path as a medieval parish boundary. This boundary, probably orginally built as a dyke in the centuries either side of 1000 BC, now separates Upwaltham from Slindon parish. It slices through one of the prehistoric barrows, leaving a trench across the centre of the mound. This section of the boundary, at least, is therefore later than the barrow.

Many parish boundaries on the downs incorporate prehistoric barrows, perhaps simply as convenient sighting points in an open landscape, but generally the boundary goes up to the mound, stops, and then restarts on the other side. Here the boundary slights the burial mound. Was the foreman just making sure the job was done thoroughly, or was the Christian parish boundary deliberately made to damage a pagan monument?

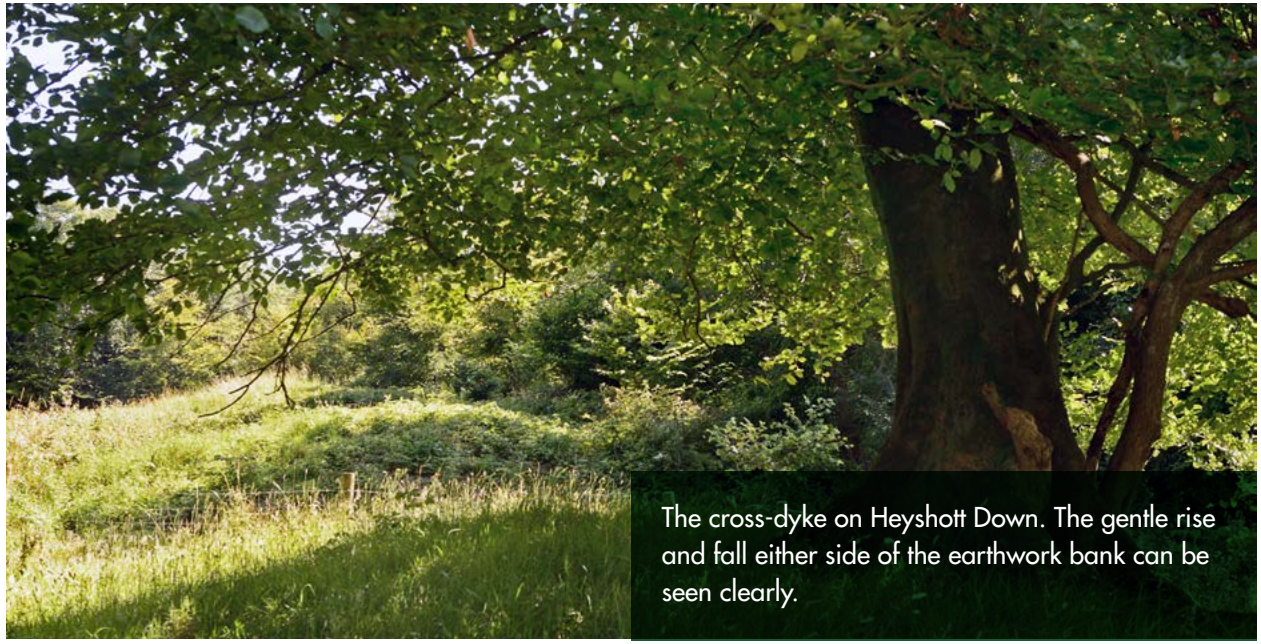
This small area in Stubbs Wood on top of one of the many spurs on the South Downs

is now used for commercial forestry, but it has played a range of different roles in the past. In common with much of the chalk of the South Downs, it seems to have been part of a farming landscape at the start of the second millennium BC and possibly for long before that. But its height and visibility made it suitable as a place for the important dead, covered with mounds to mark the land for their descendants and to remind the living of their ancestors.

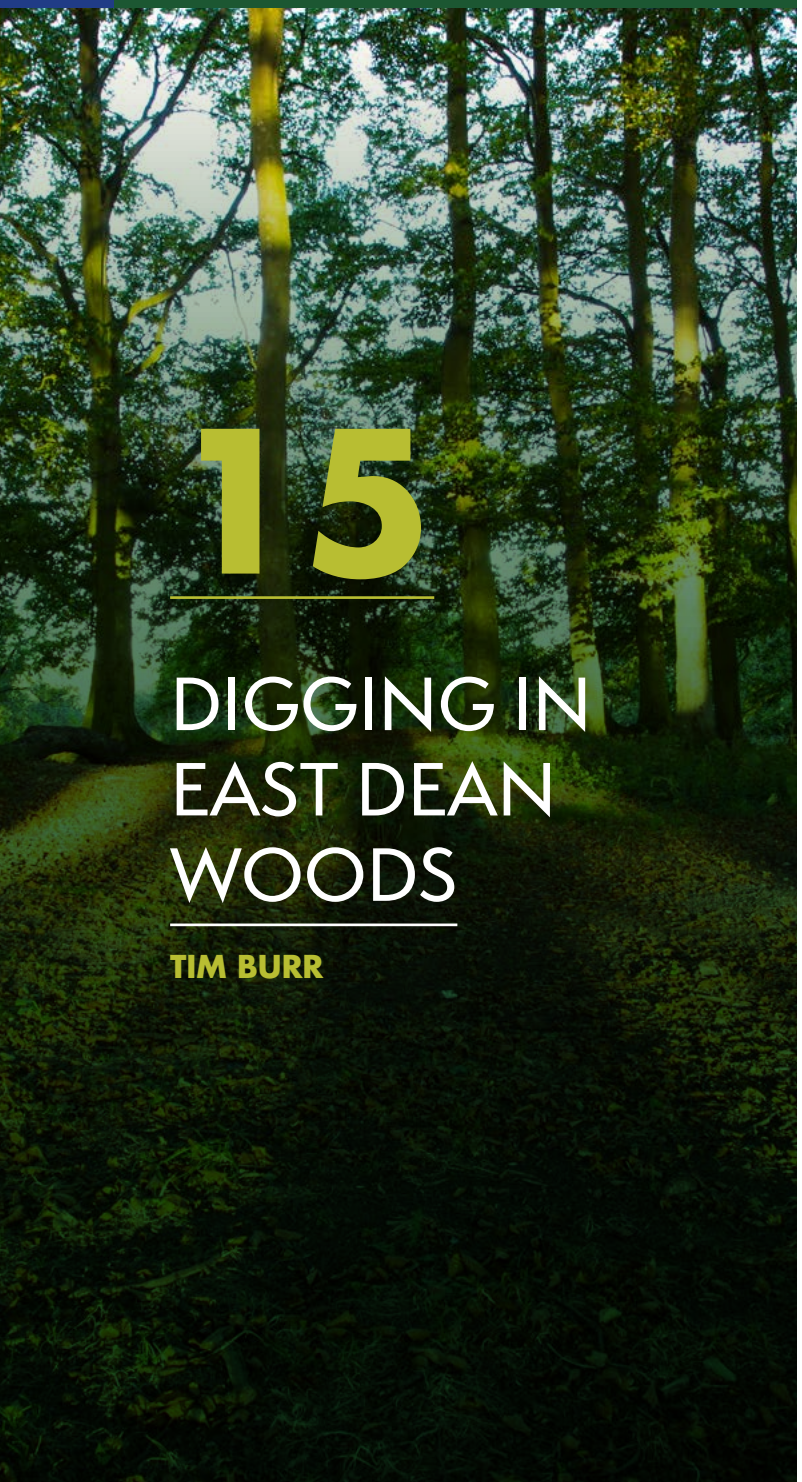
Later the end of the spur was cut off by a cross-ridge dyke. We really don't know why, but this was one of many on either side of the Upwaltham valley and on the scarps of this block of downland. Perhaps controlling or guiding the movement of people and stock between the valleys and high ground was important as society became more fragmented and communities possibly more antagonistic.

LiDAR data have increased the number of known cross-ridge dykes considerably but the old technology of walking the ground will always have its place. So the next time you go walking on the South Downs and encounter a puddle that crosses the path, look to either side. If you see a ditch and bank wonder about the people 3000 years ago whose earthworks caused your puddle to form.

The cross-ridge dyke on Lamb Hanger near Bignor Hill. The earthwork ridge, still a significant boundary after 3000 years, runs away from the viewer.



The cross-dyke on Heyshott Down. The gentle rise and fall either side of the earthwork bank can be seen clearly.



15

DIGGING IN EAST DEAN WOODS

TIM BURR

EAST DEAN, NORTH OF CHICHESTER, IS THE QUINTESSENTIAL DOWNLAND VILLAGE IN WEST SUSSEX. Lying in a shallow dip in the landscape, it has a medieval church, about 100 houses, some built of local flints, some dating back to the late medieval period, plus a village pub and a village pond. It is surrounded by an ordered agricultural landscape of hedged fields. Beneath this modern landscape, however, lies a much earlier agricultural one, an arrangement of fields and trackways that may date back to the pre-Roman period.

Just how extensive the former field systems were on the downland chalk is clear from the LiDAR imagery at the heart of the High Woods project. Such extensive features are a challenge to archaeologists more used to excavating specific 'sites', such as monuments or buildings. They can't excavate a whole landscape. But, using the imagery, they can pinpoint places most likely to hold clues to the meaning of the wider system. Such a place lies in East Dean Woods, 1.5 miles uphill from East Dean itself, where a trackway once threaded its way through ancient fields.

The main task for the excavators was to cut a trench through the trackway, and the banks on either side of it, down to the underlying chalk. The work was hard going, as the banks contained a lot of flints. These would have been cleared from the land by its first farmers and dumped at the field margins, helping to form the banks. Once the banks were established, and perhaps topped with hedges, further changes would have followed. As the fields were ploughed, the loosened soil would have shifted downhill.

Later on, people needed a new trackway through the fields, perhaps to move their cattle between the low pasture around today's East Dean village and the high pasture of the downs' crest. The thin and unproductive soil below the bank would have seemed a good place to put it. Ploughing would have continued on the downhill side of the new track, removing not only soil but some of the chalk as well. The effect was to create a step or bank between the track and the field below, enhanced by the dumping of more flint cleared from the field.

But then, as the excavation proceeded, something else came to light. Where best protected from damage by the thick soil of the lynchet, the chalk was marked by a series of parallel lines. They continued round the corner into the smaller trench. The marks or stripes were spaced at about half-metre intervals. The lines were blurred, but their general sense was still clear enough to call for explanation.

The lowest part of the overlying earth looked like an ancient plough-soil, rather than redeposited material from further up the slope. So perhaps the marks were originally made by equally ancient ploughs? As the author of a detailed study of such marks, when at university, this was for me an exciting possibility, but I had some misgivings. Prehistoric ploughs, known as 'ards', were simple devices that pulled a wooden or, later, an iron share through the soil, and were typically drawn by oxen. They were not

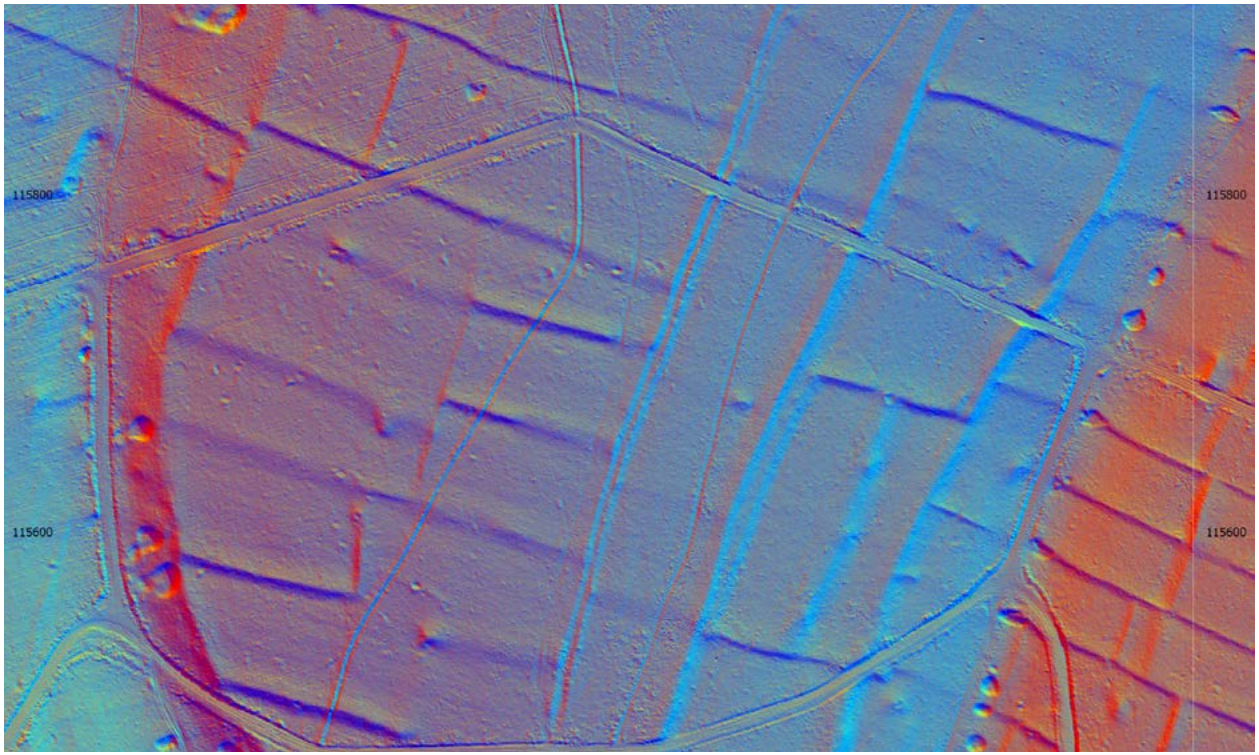
ploughs in the historical and modern sense, with a twisted blade to turn the soil over and throw a furrow. To achieve sufficient tillage of the soil, the grooves cut by ards were typically quite closely spaced, at around 30cm, rather than the 50cm spacing we had found. What's more, the soil was usually cross-ploughed, with a second set of grooves at right angles to the first, of which there was no sign here. Another difficulty was that the marks apparently extended under the bank marking the edge of the field, suggesting they were there before the field even existed.

When the sun's going down in the summer you can see the shadow of all our field systems.
Pearl O'Leary

So what were they? Or rather, how should they be interpreted? There are many things we don't know about the past, and perhaps never will, but we can still offer our best interpretation of the available evidence, prompting fresh research and debate. On further consideration, the excavation director felt they were more likely to date back to the last Ice Age. Under the conditions prevailing then, saturated material from the chalk would tend to move downhill. And the marks were indeed orientated in the direction of maximum slope. On this reading they were a matter of geology rather than archaeology. So archaeology is not a self-contained practice, but requires awareness of other

In the foreground the trench is cut through a lynchet, the boundary of a prehistoric field. The soil up-side of the lynchet, closer to the viewer, has built up slowly during the field's use.

This is a close-up of the soil-filled linear marks in the chalk at the excavations in East Dean Woods. The length of the scale pole is two metres.



A LiDAR image showing the extensive field system in East Dean Woods. Note the regularity of most of the layout of the fields and the indication of trackways.

branches of knowledge, not least the battery of scientific techniques now informing the study of the past – including LiDAR!

Thus there's plenty to think about with this kind of excavation. It's not about making glamorous finds. Apart from struck flints, pottery sherds and a few fragments of bone, this was not a finds-rich site. After washing many of these finds, I suspect that some of the flint may prove to have been struck by excavators' mattocks rather than by prehistoric tool makers, while the sherds looked worn by long exposure to ploughing.

However, here we were getting to understand how a whole landscape had been modified to produce the food on which everything else depended for the people of those times. The field systems' survival in the present is not only a testament to their efforts but suggests, too, that at some stage the fields fell out of use, escaping later 'improvement'. To a significant extent, Iron Age ard marks are on heavier soil than those of earlier periods, and there is other evidence to suggest that plough agriculture shifted to such – predominantly lowland – soils once iron ploughshares were available. Agriculture has more recently made new inroads, but in the High Woods of the downs we can still gain insight into a much earlier stage of its development. The history of the East Dean area thus goes back much further than the present-day village buildings would suggest.

I think the biggest, in terms of cultivation, in terms of the impact of ploughing on archaeology, the really, really big impact happened in the middle of the 20th century, and a couple of decades thereafter, where you started to get really, really deep ploughing – 18 inches plus. I think the farming community has responded quite positively to our concerns about damage to the environment, but it still happens.
David McOmish

16

WHITEWAYS PLANTATION EXCAVATION

PETER BUSBY

ON THE BRIGHT AND SUNNY MORNING OF 18 APRIL 2016, eight community archaeologists walked the winding path through Whiteways Plantation to the excavation site. The excavation comprised a trench across the south-western boundary of a large (380 × 360 metres) earthwork enclosure on the southern side of the War Dyke. This walk to work was to be the first of nine over a two-week period that shed light on perhaps 3000 years of downland history and, coincidentally, welcomed the first leaves of spring.

The enclosure bank was originally thought to be a 'terraced way' or a cross-ridge dyke – both common archaeological features on the South Downs. However, this feature was reinterpreted by David McOmish, in 2006, as a previously unrecognised hilltop enclosure. However, it was not until the Secrets of the High Woods LiDAR survey, in 2014, that the true extent of this monument was revealed. The War Dyke, immediately to the north, has massive ditches and banks that seem to wind around the northern extent of this enclosure. More intriguingly, at the point where the War Dyke intersects with the south-western enclosure bank, the Dyke's southern ditch and bank turn 90° to the north for a short distance. To the west of the enclosure the War Dyke suddenly becomes a much smaller earthwork. All of this suggests that these two landscape features – enclosure and War Dyke – were closely related.

Working days started at 9.30 am and involved digging through the root-matted soils to reveal the structure of the boundary earthwork. On most days the mild spring weather allowed lunch breaks to be taken next to the trench, using moss-covered tree stumps as seats. Even rain, mid-way through the dig, did not dampen the outdoor dining, or the spirits, of the excavation team. However, the route between the upper and lower parts of

Is that something interesting on the end of my hand-shovel? A volunteer helping at an Open Day during excavations at Whiteways enclosure, Arundel Estate, April 2016.

Taking off some of the top layers of soil at the Whiteways excavation. This is usually an arduous task, especially in woodland.

the site did become treacherously slippery. No-one embarrassed themselves by falling over, with the notable exception of the dig director! Be warned – sometimes you do have to take your eye off the archaeology and look where you are going!

By the end of Week 1 it was becoming clear that the south-western enclosure bank had a long-hidden external ditch, just four metres to the west, thankfully within our trench. The construction of the bank itself proved to be far more than just a mound of chalk – chalk, of course, comprising the underlying geology in the area. It became clear that the enclosure and the land around it had been subject to cultivation long after the enclosure's abandonment. As a result, the last week of excavation began with a feeling of real, excited anticipation that we were going to change our understanding of the monument.

The excavation of the ditch revealed it to be 3.35 metres wide and 1.15 metres deep. It had a moderately sloping inner face (eastern), a steep outer face and a flat base with a narrow slot cut into it along the base of the western side. This provided useful evidence of how the ditch was originally dug. A narrow slot had been cut through the horizontal beds of chalk on the western side of the ditch, which allowed the hard chalk within the ditch to be simply levered out with little effort and carried up the shallower eastern slope to form the bank.

After the ditch was cut, it subsequently silted up with a chalk-rich fill, and at some point was recut. The fill of the recut was unusual, as it contained a large quantity of flint nodules, one of only two deposits from the trench to do so. Even the natural chalk in this location was devoid of large flints. The recut also contained some precious sherds of probable late Iron Age pottery, which may provide a date for this phase of the ditch.

> And there's one element of the War Dyke that cut off on a spur just north of Rewell Wood and joined a big linear earthwork that heads along to Chichester, and suddenly the penny dropped. You've got this incredible late prehistoric Roman land organisation on the Sussex coastal plain. It's just beautiful. Really really beautiful … . And you could see that the War Dyke – which is this fantastic earthwork that comes up from the Arun, sweeps up into Whiteways Plantation and then heads back down towards the coast – was enclosing a big block of land … and within that you of course have those earthwork complexes that I was working on with the Worthing Archaeological Society. So this wonderful narrative of landscape development emerged.
>
> David McOmish

While the ditch was being dug, the bank was being sectioned (i.e. we dug a trench right across the bank). It quickly became clear that the inside of the enclosure had been intensively ploughed during a later period, after the bank had been constructed, as a

chalk-rich plough-soil had built up against its inner face, forming a positive plough lynchet. Positive 'lynchets' or field boundaries are created when ploughed soil moves gradually downhill over time and forms a larger boundary. This explained why the ground level within the interior of the enclosure was over one metre higher than that outside.

The construction of the bank had begun with chalk-rich soils piled up along the line of the bank. On this layer, loose crushed chalk was dumped, with larger lumps of chalk employed to consolidate the eastern face of the bank. This gave it a relatively gentle profile and a width of at least 4.25 metres.

However, it was the western face of the bank that provided the real surprise. It had been cut away at some time after the enclosure had gone out of use, presumably when the land to the west of the enclosure had also been ploughed. It was this ploughing that had partly removed any earthwork evidence for the ditch, explaining why it was not visible on the LiDAR survey. Under this plough-soil were found the fragmentary remnants of a flint wall running parallel to the bank. This suggested that the enclosure bank was originally revetted (or faced) on its outer side by an unmortared flint wall. It seems probable that the large flints recorded in the fill of the recut ditch probably originated from the outward collapse of this wall.

As with many excavations, on the penultimate day a remarkable discovery was made. The bank had been built over an earlier plough-soil, which in turn covered an even earlier stone-surfaced trackway 1.9 metres wide running from north to south across the trench. It had been cut into the underlying chalk.

The last day on site ended with afternoon cakes and tea, taken in the dappled and greening light of spring-time woodland. The animated talk, between mouthfuls, was of a new, possibly Bronze Age, trackway cutting across the hilltop landscape. We pondered the fact that we had investigated an area of downland landscape that appeared to have been subjected to cultivation since at least the Iron Age, and quite probably earlier.

Our enclosure had been built within this farming landscape, possibly during the middle Iron Age. Its ditch provided the quarry for material for the enclosure bank, and the large flints for its outer revetment wall presumably came from the flint-rich exposures of chalk further down the hill. We imagined that the bank could have looked spectacular with its flint wall, but it would probably not have been much over 1.5 metres high, and may have had a hedge rather than a palisade on its crest. Given this, and the fact that the ditch was three metres wide and could have been easily crossed, it seems most unlikely that the enclosure boundary was defensive in nature.

This suggested that the enclosure might belong to a class of monument called a univallate enclosure (a fancy name for an enclosure surrounded by one ditch), which may have contained a high-status trading and farming settlement complete with animal pens. Unfortunately, the later ploughing which obliterated surface evidence for the ditch has also obscured any earthwork evidence of internal structures and features from LiDAR's all-seeing gaze. We all retraced our steps through the Whiteways Plantation for the very last time. We knew a lot more now about that enclosure; also knew that there was a lot more to discover. But that's archaeology for you!

Volunteers help out in the excavation trench at Whiteways. Archaeologists spend a lot of time on their knees or bent over!

View the full Whiteways Plantation excavation report here.

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EAST DEAN WOODS EXCAVATION

PETER BUSBY

ONE WEEK AFTER THE END OF THE WHITEWAYS EXCAVATION AND WE WERE BACK OUT ON SITE. It was a Monday morning, 9 May 2016. This time we were deep in the woods at East Dean for eleven days, excavating a trench across a trackway and the ancient fields to either side. Parts of this hidden landscape have been known since the 1950s, and a Roman site was excavated in 1953–4, just to the south of the trench. However, the Secrets of the High Woods LiDAR survey has revolutionised our understanding of this landscape. It clearly reveals what is known, rather inelegantly, as a 'co-axial field system', which covers almost the whole of the wooded area. This is a field system comprising small, sub-rectangular fields formed by earthwork boundaries or lynchets, divided by north–south-orientated banked trackways running from the valley bottom up to the high downs. Parts of this agricultural complex could have been in use anytime from the Bronze Age up to the Roman period and beyond.

The journey to the site involved a long drive along forest tracks, then off-road through the trees to the trench. Here, the noise of the 21st century was muffled by the rustle of leaves. The halting progress of deer through the wood was disturbed only by the chink of our mattocks on flints. Deer were not the only things on the move that Monday morning, however. Our quiet concentration was broken by very unexpected glimpses of a nude jogger striding through the trees. He looked as surprised as we felt.

Lunch breaks, as at Whiteways, were taken al fresco, next to the trench. And, as at Whiteways, the work was hard, involving much mattocking through root-matted soil and mounds of flints. Responding to requests at the end of the Whiteways excavation, some training was given in the art of mattocking and the use of a fork. By the end of the excavation, both old and young were as proficient in the use of these tools as they were with trowels.

> It's one of the areas with the best surviving field systems. In other words, the banks between the fields in some places stand metres tall.
> James Kenny

The excavations also provided many opportunities for the volunteers to record the deposits we were excavating. Every different layer of soil has to be fully described. In addition, during the second week, the arrival of Professor Martin Bell (Reading University) and his research student, Elsie Brooke, to take environmental samples, gave us the opportunity to learn a little about the geochemical analysis of archaeological sediments. Such analyses can help answer questions such as how particular soils were formed or whether animals were located nearby in our ancient landscapes.

By the end of the second week the excavation, recording and sampling had been completed and the story of this little part of the field system brought to life. It was clear

from the different soils exposed in the trench that the three fields investigated on either side of the trackway (which turned out not to be an original feature of the field system) had very different histories. This was perhaps not surprising, as fields were no doubt often chosen to grow a variety of crops, and these may have changed over time with different developments in farming. Phenomena such as soil exhaustion would also have dictated changes in field use. But what we managed to expose in the trench was evidence of a long history of use from possibly the Bronze Age through to the modern woodland plantation.

Now for the archaeological details. The earliest deposit was a largely stone-free plough-soil to the west of the trackway, lying directly on the natural chalk. It was possibly of Bronze Age date. The battered and worn edges of the flint waste flakes (flakes discarded from the knapping or manufacture of flint tools) from this layer, and the small, abraded fragments of pottery, indicated that this was indeed a plough-soil. However, chalk lumps, which might be expected in a plough-soil, caused by a plough cutting into underlying chalk, were largely absent. This suggests that the soil in the woodland has been subject to decalcification – a natural process that breaks down chalk lumps. We also recognised the development of a field boundary in its earliest stages, along the line of the eastern side of the trackway, as this layer became thicker at this juncture. This was due to soil moving downhill as the result of ploughing, and accumulating against a field boundary, forming what is called a 'positive lynchet'.

As at Whiteways, taking off the topmost layers at the excavation in East Dean Wood is a challenge. Mattocks, pick-axes and shovels are the order of the day.

Subsequently, an east–west-orientated field clearance cairn developed on the surface of this plough-soil. People, millennia ago, must have collected and dumped on the field's margins the larger stones that had been brought to the surface by continued ploughing. The construction of a clearance cairn directly over the early plough-soil suggests that a bigger field was being subdivided into smaller fields at this time.

Cultivation appears to have continued during the Roman period, and at some point the trackway was cut into the western edge of these fields. A spread of flint gravel was laid to form the surface of the track itself. This demonstrates that this particular trackway is not an original feature of the field system. Over time, another clearance cairn was built on the western side of the track and cultivation ceased – probably first in the north-western field (as a thick windblown soil had time to develop over its plough-soil), then possibly in the south-western field and finally in the eastern field. This last field matches a long, narrow area of pasture depicted on the 1874 Ordnance Survey map, a record of an agricultural echo from a distant past. By the late 1890s it was incorporated within woodland.

Compared with the some of the more dramatic archaeological discoveries in Britain in the last few years, our excavations at East

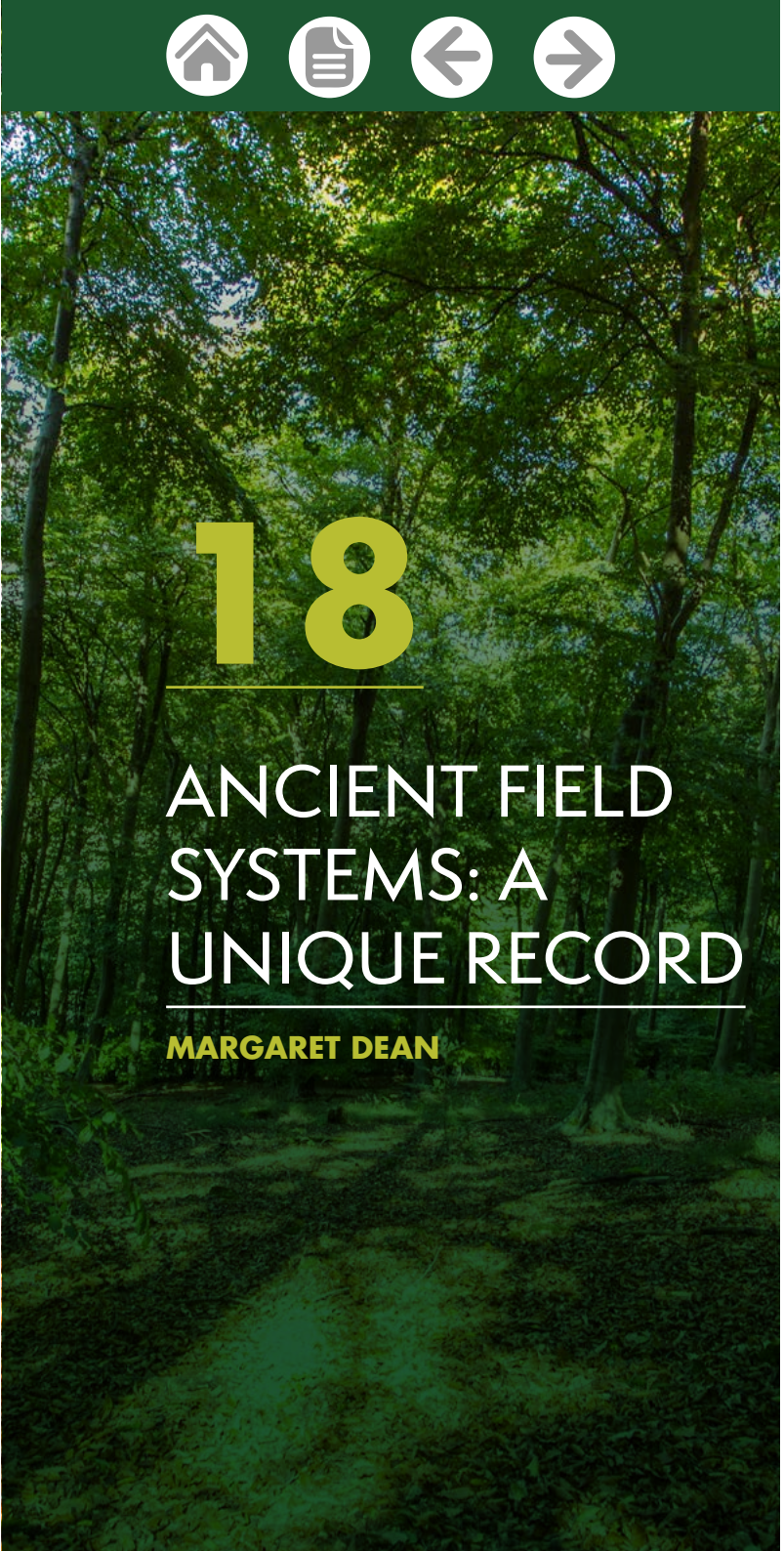
An al fresco lunch amongst the trees during the excavations at East Dean Woods. Proper chairs were limited, so tree stumps and tree trunks provided alternative supports.

Start of the excavations at East Dean Woods. Here volunteers get to grips with trowelling (i.e, cleaning) one of the upper and more recent layers.

Dean may seem, well, a little underwhelming. However, they have a direct relevance to most of the ancient field systems discovered in the High Woods. They remind us that, despite some field systems initially appearing from their plan as if they were laid out all at the same time, the reality on the ground was probably more complicated. Some fields were added over time, some fields divided, some enlarged, some abandoned. Trackways, too, may have been extended, fallen into disuse or been realigned. These transformations were ultimately caused by changes in the practices of communities of people who farmed those fields and walked those trackways. It is going to take a lot of hard work to unravel some of these complexities – but it's going to be fun, too.

> We don't know when these field systems were put in place. We don't know who operated them. We don't know what they grew. We don't know where they lived. We don't know how they transported the produce. We don't know whether they used animals in some of the fields and corn in other fields. We don't know if they rotated them. We just don't know. Nobody's really been able to study them … . This is the start of an opportunity to do that.
>
> James Kenny

View the full East Dean woods excavation report here.



18

ANCIENT FIELD SYSTEMS: A UNIQUE RECORD

MARGARET DEAN

IN AUTUMN 2014 I BEGAN STUDYING FOR A MASTER OF SCIENCE DEGREE in Applied Landscape Archaeology at the University of Oxford. My chosen area of research was the ancient field systems on the South Downs in Sussex. But why this topic? I come from a background of both farming and aviation and, strangely perhaps, these two subjects come together for this research. I studied agriculture at university as an undergraduate and worked on a variety of mixed farms afterwards before taking on my father's farm in Sussex. However, I have always taken an interest in what can be seen from the air and most of my career has been spent working as a professional pilot, flying both light aircraft and large airliners.

The new technology of LiDAR, employed in the aerial survey of the Secrets of the High Woods project, has revealed vast areas of previously unseen field systems within the woodland landscapes. LiDAR provides aerial imagery from laser scanning and has the facility to 'see' through a woodland canopy to reveal features on the ground surface.

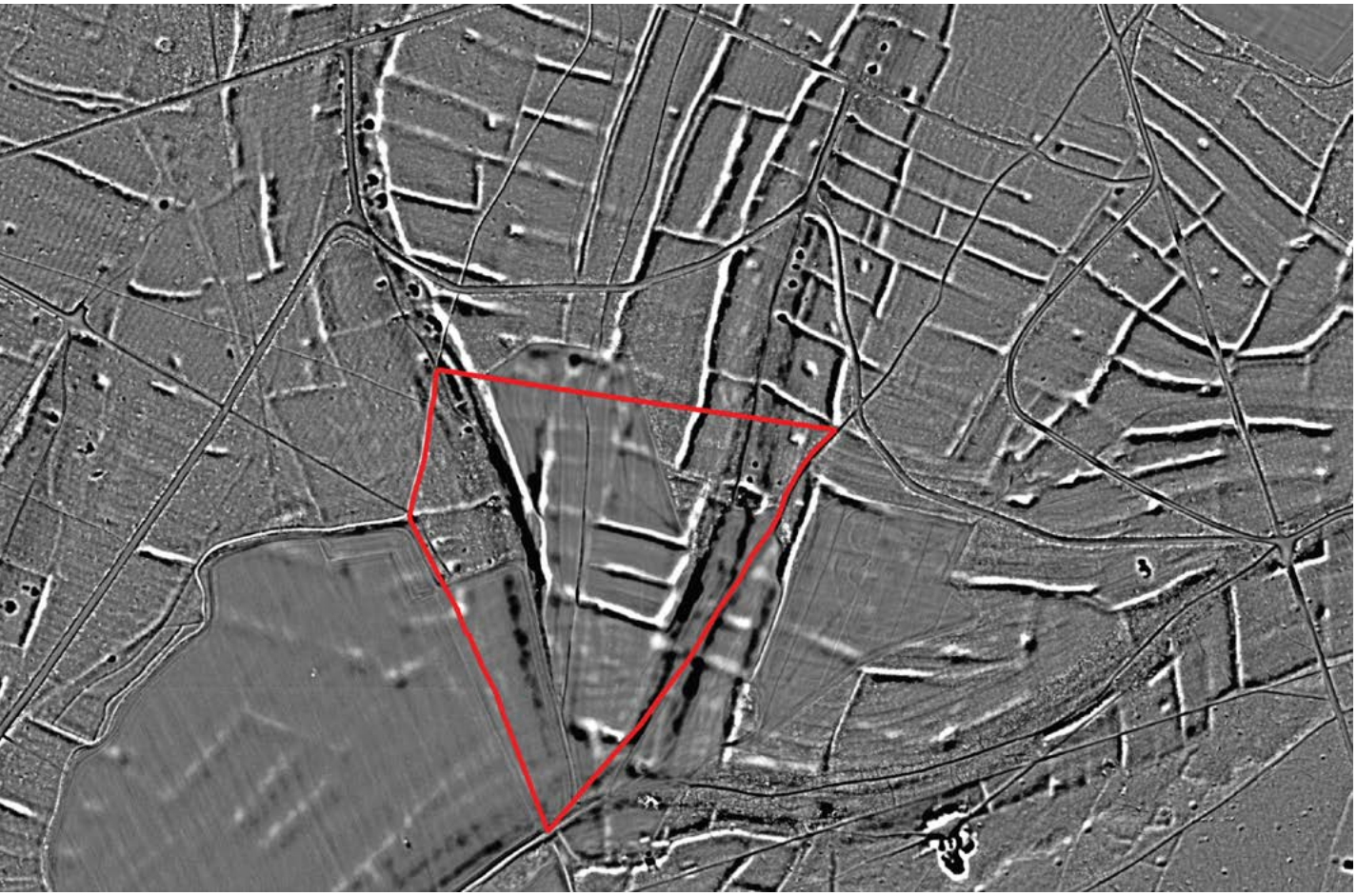
BACKGROUND

In the early days of aerial photography, in the 1920s and 1930s, extensive areas of ancient fields were found to be still visible on the Sussex downlands. They were laid out in an ordered pattern and although their origin was unknown they were given the name of 'Celtic fields'. They showed as upstanding boundary features in the grassland and scrub, and in the ploughed areas could be seen as differentially coloured soil marks. Because the soil was chalky and relatively unproductive, many areas were not routinely cultivated and the old boundaries remained. Modern satellite images sometimes show the layout of the ancient field systems within the extensive present-day fields as cropmarks and soilmarks or in grassland as earthworks.

Since WWII, however, these fields have largely been destroyed by the action of the plough. The demand for extra food production meant that many areas were returned to cultivation. After the war the demand continued and agricultural subsidies encouraged farmers to increase production further. Horses and light tractors were replaced by heavy tractors pulling ploughs which cut deeper into the soil. As a result most of these old field systems have now disappeared from the open downlands of Sussex.

When the results of the LiDAR survey carried out in 2014 for the High Woods project started to come in, it became apparent that there were ancient field systems almost everywhere in the woodland within the project area. A fantastic resource had been uncovered by the survey: field systems hitherto unseen could be seen stretching in huge tracts across the landscape. What had been lost to the plough in the downland further to the east had been found again in the project area.

The evidence of these field systems gives rise to a whole series of new questions: questions about the people who farmed this land, when the fields were created, how they were formed and over what period of time.



A LiDAR image of the field system at Lamb Lea, East Dean. The LiDAR survey has greatly increased the known extent of the field system.

Were they changed and reused in a different form and when did they fall out of use?

The boundaries identified with the LiDAR are detectable on the ground. They appear as raised banks, sometimes several metres high, or as changes in level from one 'field' area to the next. We can investigate the relationship of the field boundaries to the slopes and contours of the land, and it can be seen in some cases that the fields do not follow the shape of the land but cut directly across it. It is almost as though a complete pre-planned field system has been draped over the land and made to fit. Another point of interest is the apparent lack of 'gateways' or obvious means of getting from one field to the next.

> I, from my musing around and stumbling about, trying to learn this ground, have discovered that those field-banks at Gumber go a lot further than the field they're in, and … one of my issues with us as people is we see things in our anthropomorphic, as they look at the time, view and we see field-banks in a field and we think that yeah, maybe the field was bigger, but we've never once thought that it was possible that the Bronze Age field system stretched from the top of the Downs to the coastal plain.
>
> Mark Wardle

My research divides into three parts. The first examines and records the form of the field boundaries, both individually and within a defined area, to see how they relate to each other. To do this a small representative sample area was chosen to look at in more detail. Measuring and recording the area will help to answer the question of 'What?' is the structure and plan of the layout. The fields vary in size but by modern standards are small; typically they are between forty and sixty metres in

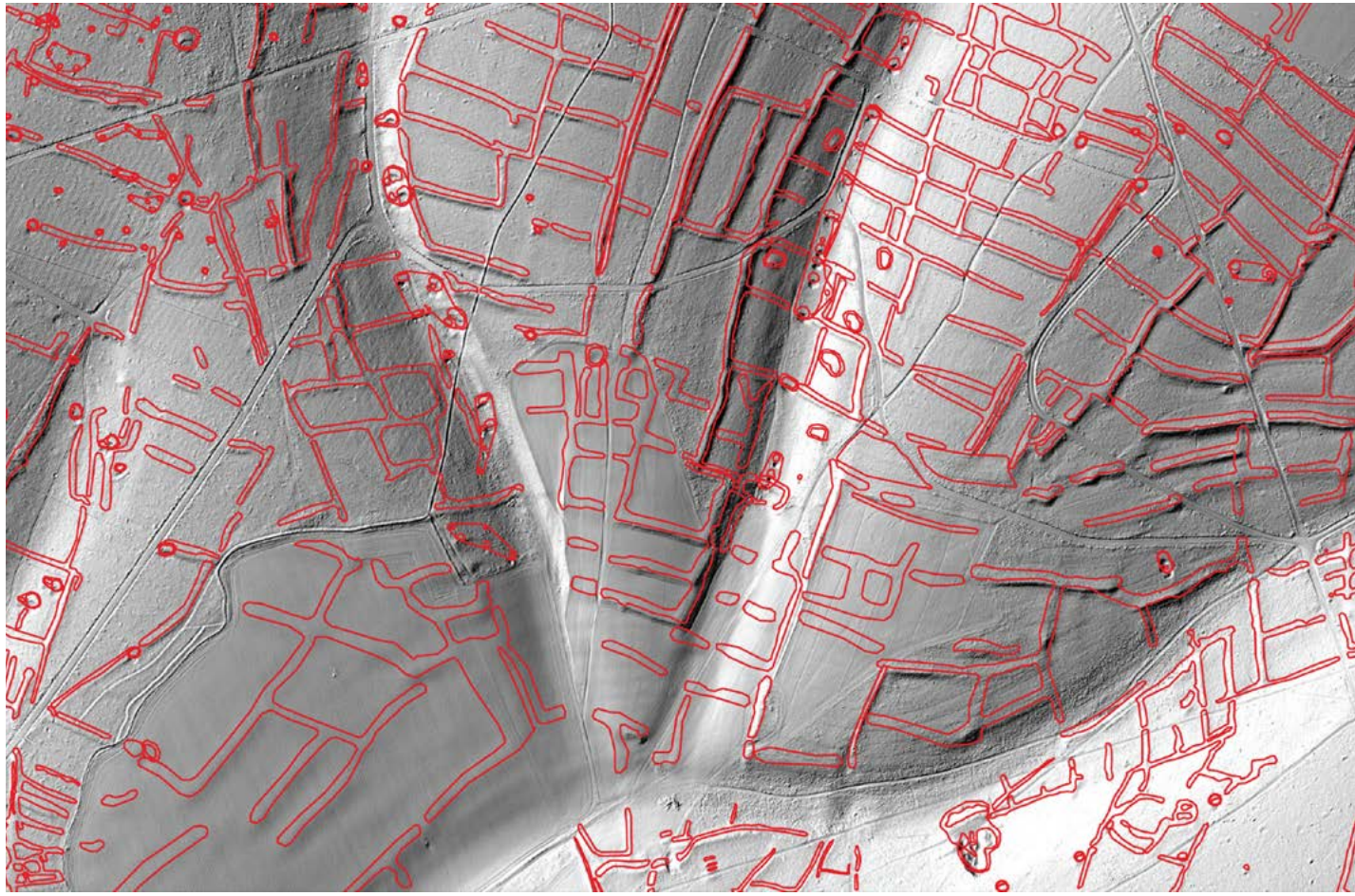
width and sixty to a hundred metres in length – less than a hectare in area.

The next step is to try to understand 'How?' the field boundaries systems came into being. Were they built specifically, did they form naturally, or was there some combination of both over time? How old are the fields, and how long were they in use? To find answers a closer examination of individual boundaries was needed. Fortunately, in May 2016, I was able to join a community excavation in Charlton Forest where probable field and trackway boundaries were excavated. The results of this excavation will give a deeper insight into how they were formed and perhaps give some idea of their age.

The third part is the most difficult and speculative: the question 'Why?' Why are the fields a particular size and shape, why do they follow regular patterns in the landscape and why are the boundaries so substantial? At home on our own small sheep farm I find myself imagining how these earlier farmers may have used the land, and indeed whether they considered they 'held use rights in' or 'owned' the land outright. How was land shared out amongst communities and was farming a collective activity or carried out in small, perhaps family, groups? So far we have little indication of where the people working the fields lived. Did they live amongst them or were their homes somewhere further away?

Can we, by considering these various factors, come to understand more of their likely use? The small size of the fields suggests that they would be more suited to livestock than crops. Ox-drawn ploughs need space to turn and would be hampered by boundary banks and restricted access, although if the ground was broken prior to sowing with much simpler implements then the small fields would not have been so constraining. Indeed, it is possible that some of the smallest fields could surround small settlements.

An explanation for the considerable size of some of the banks is that they have



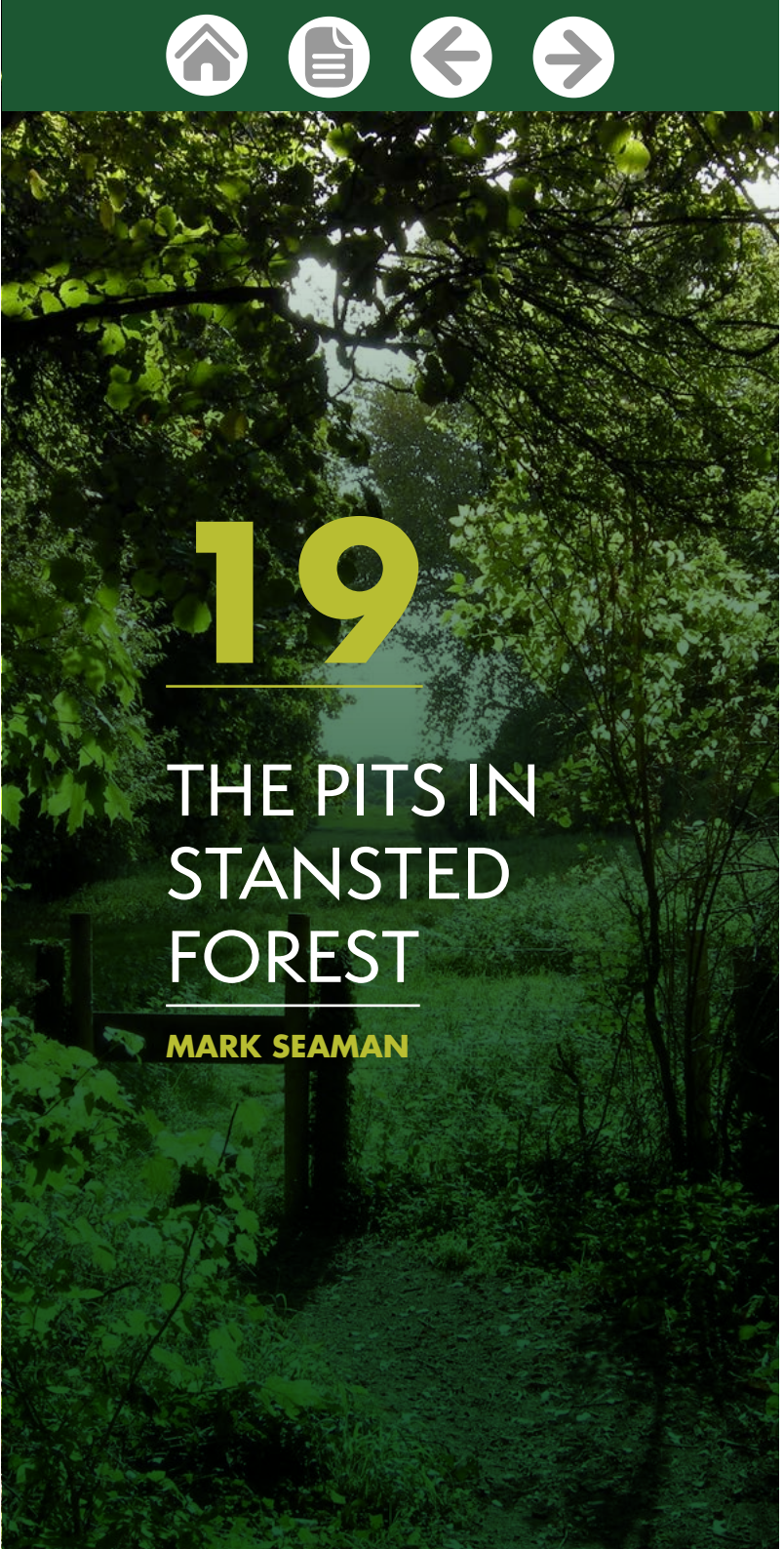
A map of a field system known as Lamb Lea, north of East Dean, prepared by staff of Historic England's National Mapping Programme from LiDAR imagery.

An aerial view of the field system at Lamb Lea, East Dean. The area outlined in red is the previously known and legally protected part – called a Scheduled Ancient Monument.

accumulated over time: they were marked out with flint originally, and then flints cleared from the fields were placed on top. Disturbed soil will naturally move down a slope until it meets a barrier, where it will accumulate – this is how lynchets are formed. But this natural process doesn't account for the boundaries across the slope. These large features seem to be a deliberate creation, and represent a great deal of work. In some places the banks are two or three metres high, which is higher than surviving banks around some Iron Age hillforts. In an open landscape these fields would have been highly visible. Was part of their purpose to impress? Could they be a statement of power, of ownership and control of the landscape?

CONCLUSION

It may not be possible to answer all these questions, but the existence of these ancient field systems allows us a special insight into the everyday lives of our predecessors. A final part of my work is to consider the future of this unique record. Should we try to ensure it is not all erased, in the way that other areas have been? These ancient field systems are an extraordinary monument to the industry of past communities and their effect upon the land. As our earliest examples of fields they hold a special place in the history of our landscape.



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THE PITS IN STANSTED FOREST

MARK SEAMAN

STANSTED FOREST IS AN 'ANCIENT FOREST', one used by Henry II, Richard the Lionheart and King John for hunting. It forms part of the Stansted Estate, which totals about 1700 acres. In turn the estate is centred on Stansted House, which dates from 1900, the previous house, built in 1688, having burnt down. For hundreds of years sweet chestnut has been grown in Stansted Forest. At one time, hundreds of thousands of fencing stakes were produced each year by an army of coppice workers. There are also many 'ancient yews' apparently randomly spread through Stansted Forest. Of course, the terms 'ancient forest' and 'ancient yew' do not mean that these trees have been growing there forever. LiDAR in the Secrets of the High Woods has categorically proven that they have not.

Stansted Forest has steep wooded escarpments or 'hangers' to the north, but slopes gently down to the south. The main house has distant views over to the Isle of Wight and the English Channel. This view is illustrated in Kip's 18th-century engraving, although the channel is actually a lot further away than it appears (see Chapter 36).

Now the odd thing about Stansted Forest is that it contains over 200 pits of varying sizes and shapes. They appear to be spread randomly through the woods. I've often wondered how old these actually are and what they were used for. The National Mapping Programme (Historic England) considers that they date from the post-medieval period. But I am not so sure. Stansted has been woodland since at least Saxon times, when 'Stanestede', as it was then called, formed part of the forest of Bere. So why dig pits in a forest?

It is true that some of these pits are probably quite recent; they have steep or nearly sheer sides consisting of chalk from just below the surface. These are known to be for extracting chalk, typically for use in lime burners or lime kilns. We know of one locally at Warren Down. However, the majority look quite different. They are shallow and saucer-shaped.

> That's one thing you pick out – the boundary banks. The dells must have been in the corner of fields. There are quite a few plantations that have got boundary banks in them and they say they were fields. They wouldn't build a boundary bank around a wood, would they?
> Michael Sutton

One day I realised that the dating of these pits was more complicated than I had first considered. I was on a field survey exploring one of the pits that had been spotted on LiDAR imagery. I felt really privileged. For the first time for hundreds of years we were able to see the ancient field boundaries that criss-crossed Stansted Forest. We all realised that, at some time in its past, Stansted had been a network of open fields and not woodland. It was one of those penny-dropping moments.

That was certainly a big discovery. But there was more. I noticed that there was

Volunteers get to grips with an archaeological survey in Stansted Forest.

an ancient field boundary that ran from this particular pit. I followed this and it led to another pit. From the second pit another field boundary, which I followed, led to yet another pit. It suddenly dawned on me that the pits were not randomly spread throughout Stansted but were in carefully selected positions associated with the old field boundaries. I also noticed that the yew trees, rather than being arbitrarily spread throughout Stansted as originally thought, also lay along field boundaries.

In order to check whether the association between the pits and the boundaries was purely coincidental, I examined an area of woodland at Stansted using LiDAR. This area was bounded to the south by the Main Avenue, a broad cleared track which runs from Rowlands Castle to Stansted House, and to the east by Broad Walk, the road running south from Forestside. This area comprises about 60 per cent of Stansted Forest and is a little less affected by modern woodland operations than the remainder. I analysed all the pits greater than about three metres in diameter – about 122 pits in total. I found that 66 per cent were associated with a field boundary and 11 per cent had no apparent association, while 23 per cent were in an area where there had been heavy forestry work and field boundaries were not visible, so I was unable to determine which category they fell into. What could I deduce from these percentages?

> When I landscaped the Lyles Wood … what I found was a chalk/clay mix … . So that is probably stuff that was got out for the fields.
> Michael Sutton

I concluded that there was an association between the pits and the ancient field systems. The field boundaries are dated as late prehistoric – i.e. any time from the Bronze Age through to the start of the Roman period. Could the pits be of a similar age?

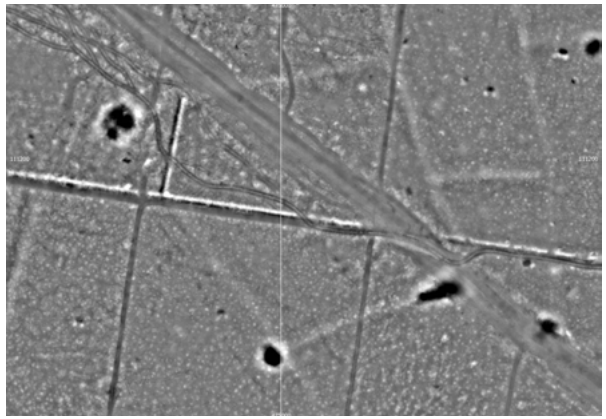
Another taxing if obvious question was the function of the pits. Were they all used for the same purpose? Received opinion was that they were used to extract chalk or flints, and that is certainly true for some pits, particularly at the bottom of the north-facing escarpments where chalk is close to the surface. However, the soil seems very different on top of the downs. I was discussing this issue with Michael Sutton, a forester who has worked in the woods for nearly fifty years. He said he had dug into a number of pits and found that

a few contained sand whilst others contained marl. None contained pure chalk. Marl is a naturally occurring mixture of clay, chalk and some sand and has been recognised as an excellent fertiliser for thousands of years. Spread over a field, a single application would improve yields for up to thirty years.

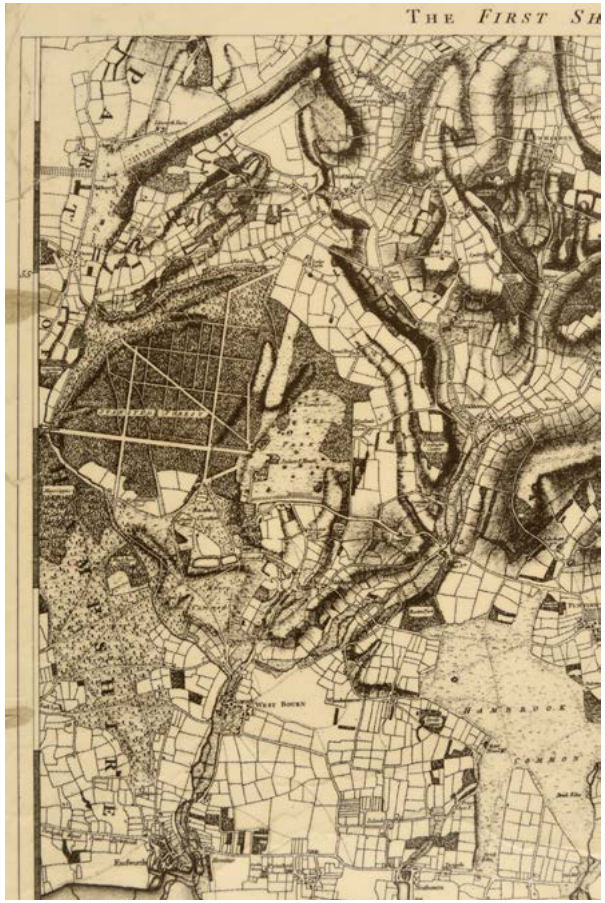
This was the connection I was hoping for. The pits must have been associated with ancient farming. Even the position of the pits in the corners of the fields makes sense – a farmer would not place them in the middle of a field and have to plough round them, no matter how rudimentary the plough. And, if we examine the pits carefully, we can see that one edge always has less of a slope. This is where the marl would have been dragged out, by animal or human power. Nevertheless, the marl must still have been dug manually. It must have been back-breaking work.

The pits are much more complicated and intriguing than we first thought. Stansted has a variety of pits and they may well have been dug over a long period of time, from late prehistory through to the late medieval period. Not all of them had the same purpose. More precise dating and confirmation of their uses will have to wait until one, or more probably several, can be excavated. But for now LiDAR had done its job. We had new theories to evaluate. And I had fresh pit-related questions to wonder about.

Alice Thorne, the project archaeologist, and volunteer members of the team try to reconcile the LiDAR imagery with what they can see on the ground in Stansted Forest.

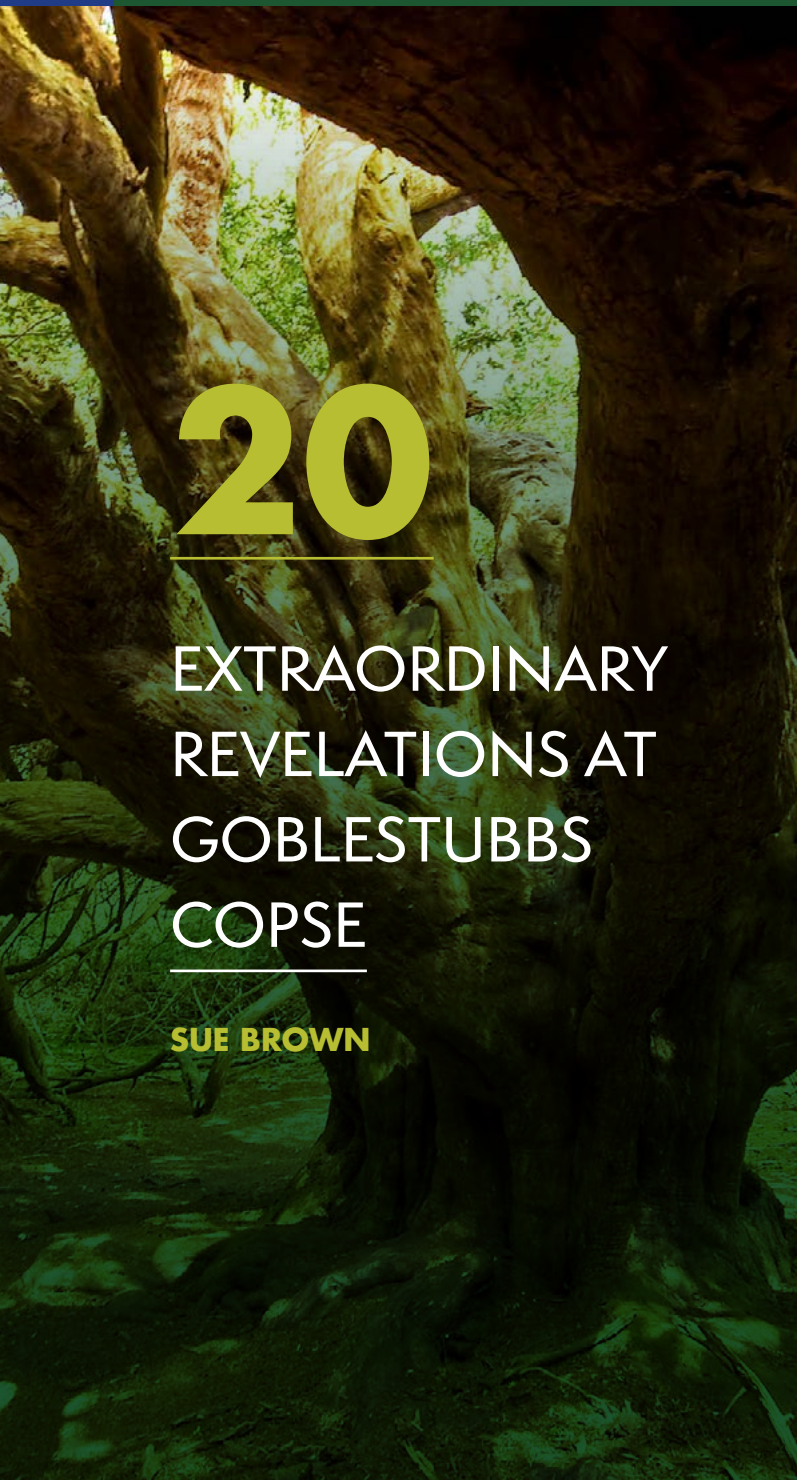


A LiDAR image of an ancient sub-rectangular field in Stansted Forest. Note how the dark anomalies (pits) lie at three of the four corners of the field.



The Yeakell and Gardner map of 1778 showing the extent of Stansted Forest and the paths through it.

Come and discover the secrets of Stansted Forest with these self-guided walk leaflets.



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EXTRAORDINARY REVELATIONS AT GOBLESTUBBS COPSE

SUE BROWN

THIS IS A STORY OF ARCHAEOLOGICAL DISCOVERY THAT IS NEARLY A CENTURY LONG.

In 1921 Dr H. Milbank Smith stumbled across some unusual earthworks hidden in woodlands at Goblestubbs Copse, west of Arundel. Eliot Curwen, a famous archaeologist of his day, surveyed this set of enclosures and reported on them, with a plan of the site published in 1928 in the *Sussex Archaeological Collections*. But what even he had not realised was that, less than a stone's throw away, under thick tree cover, lay hidden another group of enclosures, now called Goblestubbs East.

Goblestubbs West, the complex Curwen had recorded, was excavated in 1972 by Worthing Archaeological Society, led by Con Ainsworth and Dr H. B. Ratcliffe Densham from Worthing Museum. This confirmed the Curwen survey. Most of the pottery sherds were Roman in date, including one small, but fine, samian bowl found near the bottom of a ditch four metres deep.

Goblestubbs East was investigated in 2006 by Worthing Archaeological Society, led by David McOmish; site plans were drawn up by Bob Turner. The pottery revealed in the ditches was found to be late Iron Age and pre-conquest Roman, making these enclosures earlier than Goblestubbs West. One of the obvious questions to ask concerned the relationship between Goblestubbs East and West. How did these enclosures fit together?

Luckily LiDAR came to the rescue in 2014. Images from LiDAR showed that trackways from both enclosures led south towards a dead straight road or causeway that ran east–west through the waterlogged Binsted Woods. Examining this road on the ground, evidence was found of its flanking banks and ditches at the eastern end of Scotland Lane (see also Chapter 24).

To the north of Goblestubbs was a very different story. The parish boundary, which runs to the north of the Goblestubbs sites, is echoed in the layout of ancient field systems lying to its north, which are completely concealed by tree cover. These field systems extend to Madehurst Wood in the west and over to Long Lane in the east, and northwards onto the steep slopes above Fairmile Bottom.

A different picture again emerged to the west of Goblestubbs. LiDAR revealed a line of quarry pits, possibly for extracting flint, clay or marl. It would be interesting to discover if this line of pits follows a particular geological seam, or whether they were dug because they are adjacent to a convenient track or road – or both.

LiDAR, however, was not done yet, and unveiled even more! Both Goblestubbs East and West lie in an expansive area of woodland that includes Rewell and Madehurst woods. Further earthworks were located by LiDAR in these woods too. This whole complex is situated in a triangle from Whiteways car park in the north down to Chichester Lodge in the south-west and to Arundel in the south-east. (If you look at a modern road map the triangle is formed by the A27, A29 and A284, just north-west of Arundel). At the top of this triangle can be found the impressive earthworks known as the

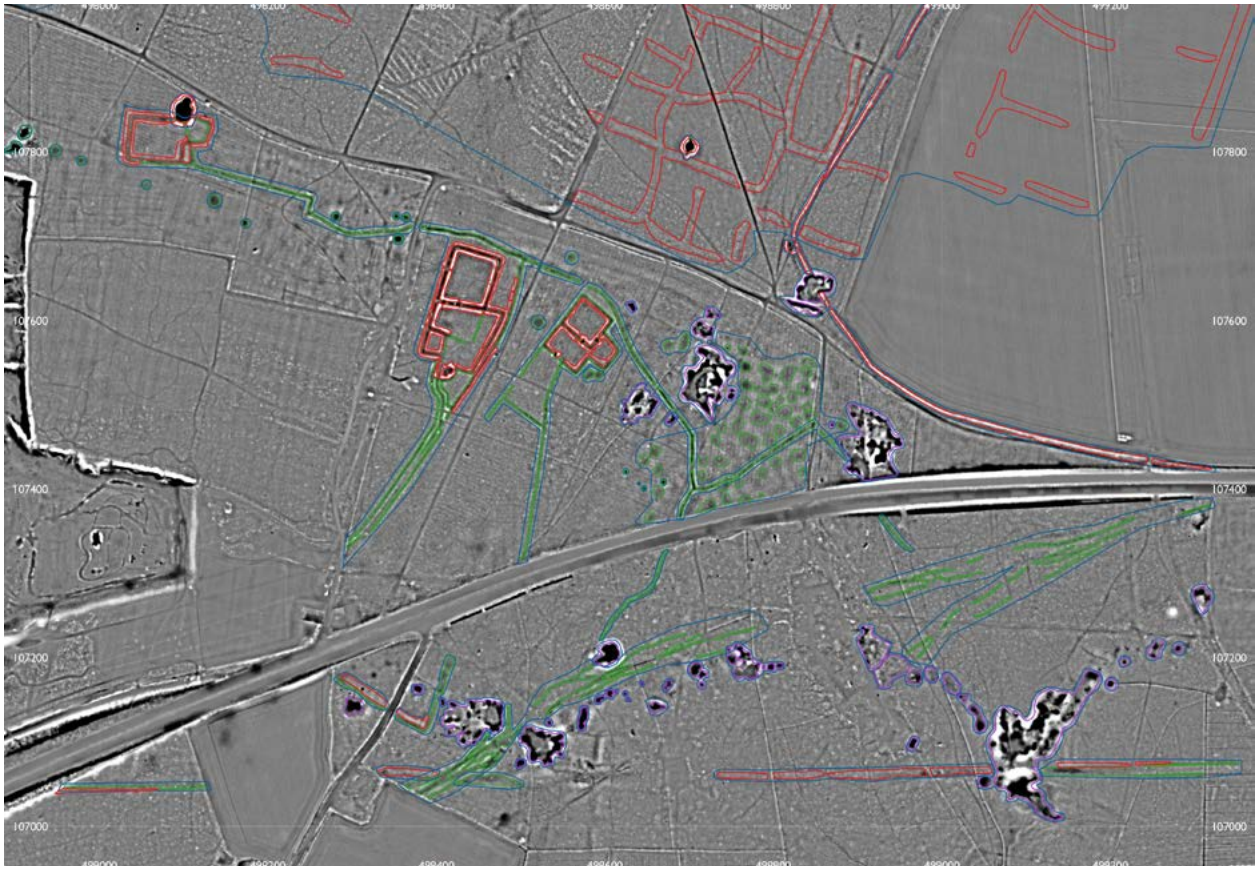
War Dyke, and fieldwork by David McOmish, Gordon Hayden and others has suggested that some of these banks and ditches form a large enclosure – just possibly what archaeologists call an 'oppidum', a sort of late Iron Age trading centre.

> There aren't that many oppida sites known in the country. One or two quite famous – Saint Albans and Colchester very very famous because of the role they play in the Roman conquest. And I think we've probably got the same here. The same sort of story.
> David McOmish

When you are walking through these woods, intently staring at the ground and trying to make sense of the humps and bumps you can feel beneath your feet, you cannot necessarily see them w ell because of the undergrowth: the colours in front of you are a variety of greens and browns, which alter with changing patterns of shade and sunlight. But in prehistory, when some of these banks were constructed, they would have been dug from the chalk and therefore a dazzling white. With less tree cover they would have been seen for miles – making an impressive statement to any friend or foe!

Now, although LiDAR is the great archaeological detector, even it has its limitations. It doesn't tell you what all this newly discovered archaeology means, how all these banks and ditches fit together. That's where interpretation comes in. And, no surprises here, archaeologists often disagree with one another! So bear that in mind when you read the next few paragraphs.

In the late first century BC, at the very end of the Iron Age, it seems that a tribe called the Atrebates lived in what is now West Sussex. They appear to have traded with people in Gaul, as imports of Roman amphorae, quality ceramic goods and metalwork have been found on various Iron Age sites. Indeed, they may well have been immigrants from



A LiDAR image showing field systems and enclosures in Goblestubbs Copse, Arundel. The A27 runs across the middle of the image. The two enclosures outlined in red, close together and left of centre, are Goblestubbs West and East. Note the newly discovered Roman road represented by the two straight lines, partly in red, south of the A27 – see also Chapter 24.

Big pieces of a large pottery vessel lie in the bottom of the ditch around the eastern enclosure at Goblestubbs. The vessel, dated to the late Iron Age or early Roman period, was perhaps deliberately broken.

Gaul originally. At some point in this period a sizeable portion of the coastal plain, from Bosham to Arundel, was bounded by large banks and deep ditches. In the west these ditches are now called the Chichester Entrenchments or Dykes. In the east the War Dyke was probably part of the same system.

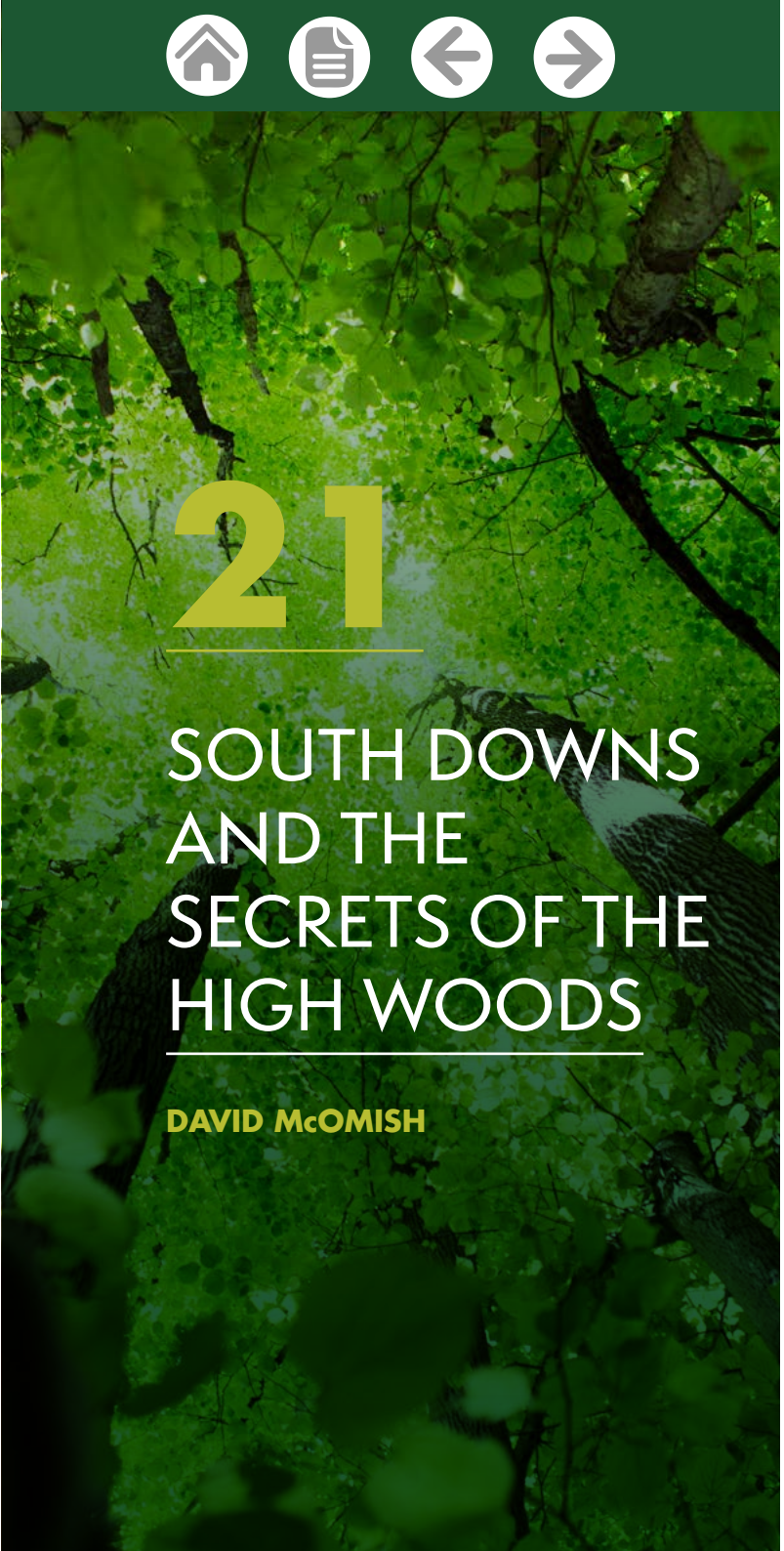
Why such demarcation? That's a very important question because if we knew the definitive answer we would understand a lot more about the local politics, land management and social organisation of this area in the decades before the Roman annexation in AD 43. There are, as so often in archaeology, competing theories, but little in the way of proof. In addition, there are a few surviving references from classical authors such as Julius Caesar, but often those references, too, are ambiguous and open to different interpretations.

Basically there seem to be two fundamental suggestions about the Dykes. One is that we see them as defending a core area for the Atrebates, who may have been under pressure from a neighbouring tribe to the north. The other is that the Atrebates had granted, or were forced to grant, an area of their coastal plain as an enclave for traders from Roman Gaul. (This might have been very loosely analogous to the position of the British in Hong Kong.) The purpose of the enclave was to allow the Atrebates to exercise some surveillance over the activities of the traders, and also monitor, and perhaps limit, the flow of exotic goods beyond the Dykes and into the hinterland.

A similar situation may have occurred in Essex around Colchester, home of the Trinovantes tribe. There, you can find the same extensive ditch or dyke systems and evidence of trade with the continent. Also apparent are continental behaviours such as drinking wine, using olive oil, dining off fine ceramics and wearing Roman-style brooches. So it appears that people in both these regions may have had some familiarity with Roman lifestyles well before the formal Roman annexation.

LiDAR is such a marvellous archaeological detector. As the key component of the Secrets of the High Woods project, it has helped us to see beneath the trees; it has helped us understand how all these seemingly isolated humps, banks and ditches form a more coherent whole; and excavation has enabled us to confirm some of these discoveries, and to begin thinking about possible interpretations. I suspect that these investigations on the ground, and the lively arguments about what it all means, will go on for at least another century – probably longer.

The very small Roman samian bowl found in 1972 in the ditch around the western enclosure at Goblestubbs.



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SOUTH DOWNS AND THE SECRETS OF THE HIGH WOODS

DAVID McOMISH

OVER THE PAST TWENTY-FIVE OR SO YEARS, archaeological research by survey teams from the Royal Commission on the Historical Monuments of England, and then by English Heritage, and now Historic England, has taken place at a number of key locales in the South Downs. This work was usually undertaken as part of specific requests for management and research purposes, and included detailed analytical work at places such as Old Winchester Hill, Cissbury, Wolstonbury and Mount Caburn – all conventionally described as Iron Age hillforts. Much of this work is published or is available from the Historic England archive in Swindon.

As well as this, however, investigation was carried out as part of two major research projects: one looking at England's earliest enclosures, causewayed camps, which saw survey at places such as St Roche's Hill, better known as The Trundle, Offham, Belle Tout and Combe Hill; the other project assessing flint mines dating to the Neolithic – on Harrow Hill, or Church Hill, for example. A significant component in both of these major projects was aerial photographic transcription of the known sites and their wider contexts, but also of putative Neolithic flint mines, including those on Bow Hill. Alongside this, museum searches successfully retrieved material for dating purposes and as a result we can now see that flint mining started early in Sussex – possibly as early as the late fifth millennium BC – and these sites must be regarded as amongst the earliest monuments in the English landscape.

Some time ago – just in advance of the designation of National Park status on the South Downs – English Heritage attempted to develop a larger-scale project looking at the historic environment within the (then) proposed National Park. The intention was that this would have mirrored similar work in South Wiltshire and on Salisbury Plain Training Area, but it never got fully off the ground for a number of reasons. The scale of the South Downs is enormous and it was apparent that in order to complete the work huge resources would have been required, even to accomplish the most basic level of archaeological field survey.

Nonetheless, a good amount of survey work was undertaken, including assessments at the major middle Bronze Age settlement site at Plumpton Plain and the early motte and bailey complex above Edburton. In addition to this, the National Mapping Programme has been busily mapping archaeological features from aerial photographs and large areas across eastern Hampshire and West Sussex (as part of the Secrets of the High Woods project) have been covered, as well as a substantial tranche of the East Sussex coastline, including Beachy Head and inland along the course of the Adur and Ouse valleys. The results of this work have been substantial and show the complexity and detail of land use, of all periods, across the South Downs landscape.

We know that the open downland landscapes here host some of the most spectacular archaeological sites in the country – there are few sites that can compete with the

Wolstonbury Hill juts out in a commanding way from the north scarp of the downs above Hassocks. A slight bank and inner ditch surround the hilltop, conventionally described as a hillfort.

setting of Chanctonbury Ring, or the size and scale of Cissbury or Devil's Dyke (again, all hillforts); but it is also evident that our projects follow in the wake of some hugely influential and brilliant archaeological thinkers, all the way back to the work of prominent amateur archaeologists such as the Curwens in the early 20th century. Indeed, as professional archaeologists, it can sometimes feel like we are tinkering at the edges of some impressive earlier amateur work and merely adding touches to previous discoveries.

In terms of recent archaeological survey, two separate but related strands emerged. The first of these is that there is a long-established tradition of archaeological investigation in the area, unmatched throughout the UK. The Sussex Archaeological Society, for example, is complemented by a number of vibrant local archaeological societies and groups, all full of keen amateur archaeologists. The second is that when we look at the distribution of known monuments deriving from past fieldwork there are clear gaps – most notably in wooded areas, particularly older, established woodland in place since, at least, the middle of the 20th century.

Curwen had noticed in the first decades of the 20th century that many of the sites on the downs were succumbing to cultivation. Indeed, much of his early work might be viewed as a response to threats from agriculture. He had sought, unsuccessfully as it turned out, to move the focus away from the open chalk landscapes to the more wooded sections, which had avoided ploughing. This was a locus, too, for more recent English Heritage fieldwork and one of the areas that emerged as being of major significance was the woodland to the west of Arundel.

In this locality basic reconnaissance revealed a landscape of intense archaeological survival with remains of various periods apparent, many of which were in excellent states of preservation. Some elements were well known: the War Dyke, for example, as well as a series of earthwork enclosures presumed to be of medieval date. A walk-over survey suggested, however, a more complex chronology and a working hypothesis emerged which speculated that the enclosures

were earlier – perhaps late Iron Age and/or early Roman in date. At this time, English Heritage was also in the process of revising the schedule of protected monuments in the area, so it was clear that further investigation was needed on the sites. The first port of call was the Worthing Archaeological Society (WAS).

> The Curwens – these people were really special. Really, really special. So I was very fortunate that I had this fantastic research platform to stand on and take it forward.
> David McOmish

Following on from site meetings it was clear that WAS was very keen to lead on this project and it was decided to focus our efforts on a complex known as Goblestubbs Copse East (to differentiate it from a near neighbour of the same name to the west). A brief for investigation was produced and work commenced. This was meticulously planned and executed by WAS, and it was obvious that their local knowledge far outstripped that from any other source. It was more than this, though. They were driven on by remarkable levels of energy and enthusiasm, as well as a commitment to understanding the past and to communicating this to a wider community.

In addition to the fieldwork, WAS undertook a museum search which revealed evidence for earlier and unpublished work at the western complex. Now, as well as having excellent fieldworkers, WAS also boasts a number of finds specialists, including some regarded as experts in their field, and this enabled clear identification of late Iron Age and Roman material in the museum collection – thus corroborating our working hypothesis.

Work continued on the eastern complex over the course of one summer and included field survey as well as excavation. It was hard going, yes, with difficult digging in a heavily wooded setting, but was carried out in an exemplary manner, easily matching the standards seen on excavations run by professional organisations. The excavation was well coordinated – excavation teams,

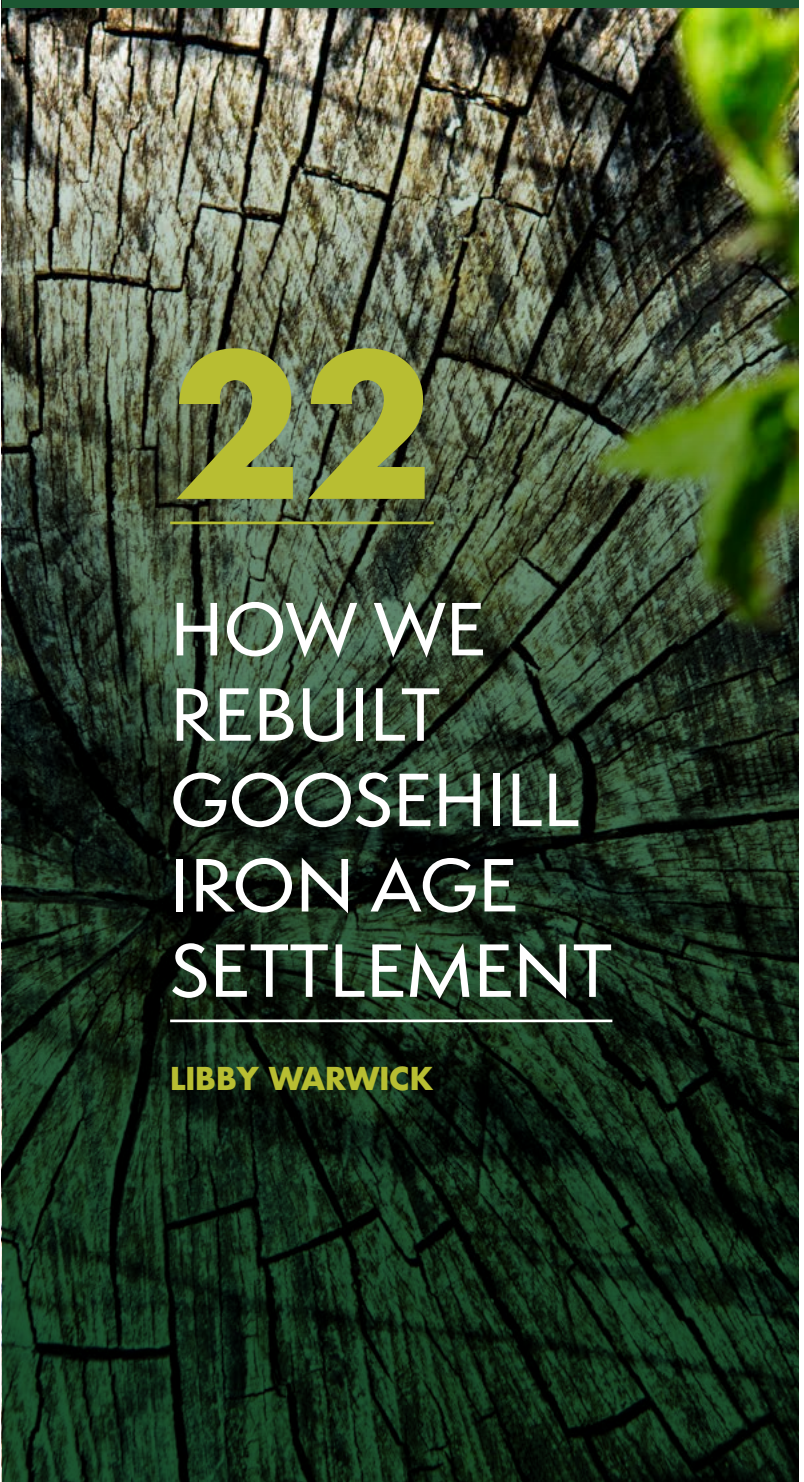
There are a lot of large depressions at the western end of Cissbury Iron Age hillfort (above Worthing). They are the filled-in shafts of 6000-year-old flint mines.

The Iron Age hillfort of Chanctonbury Ring, above Washington, is one of the most celebrated monuments in the South Downs National Park.

Mount Caburn, just to the east of Lewes, is a late prehistoric hillfort. Whether anyone ever lived within its banks and ditches has yet to be proved.

survey teams and a finds processing unit too – and there was no evidence of a 'professional/non-professional' boundary, which is occasionally apparent when professional archaeologists work alongside amateurs. On-site debate was occasionally challenging but always productive and, ultimately, the results proved to be worth the effort, showing conclusively that the site did indeed date to the late Iron Age and early Roman periods.

This work has provided a platform for further investigation on the site by WAS and the results from this new work will undoubtedly add much further detail on the chronological development of this exceptionally important landscape in the woods. For the time being, theories abound. Particular speculation surrounds a large enclosure south of the War Dyke. Is it a hillfort, an oppidum (a particular type of late Iron Age site usually containing evidence of trade and small-scale craftwork), or something different again? Professional archaeologists are notoriously averse to speculation (certainly in print); amateur archaeologists perhaps less so. But both would agree that the Secrets of the High Woods project has highlighted so much new archaeology that it will keep both professional and amateurs busy working together for centuries to come.



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HOW WE REBUILT GOOSEHILL IRON AGE SETTLEMENT

LIBBY WARWICK

ON THE SIDE OF A STEEP INCLINE WITHIN THE WOODLAND OF KINGLEY VALE lie the remains of an Iron Age settlement. Named Goosehill, it is relatively small, consisting of two concentric enclosures with evidence of three circular dwelling platforms within the central area. It is reasonably well known to archaeologists and parts of the settlement have previously been excavated, but the LiDAR survey has allowed its full shape and form to be determined from above.

This is hugely exciting in itself, offering archaeologists further evidence of a way of life here thousands of years ago. But what would the modern visitor to Kingley Vale make of it? Despite the clarity of the LiDAR images, it would take a great deal of imagination to see the banks and ditches as enclosing the homes of one or two families, complete with all the daily activities of Iron Age life. This is where the team at Jam Creative has attempted to bridge the gap between the evidence found and the stories about everyday life that we want to tell.

We recreate ancient environments, using LiDAR data and expert insight, to bring the settlements and activity of prehistory bang up to date. Using virtual reality (VR), augmented reality (AR), 3D animation and gaming technology we allow people to be immersed, virtually, in another world. So how did we go about it?

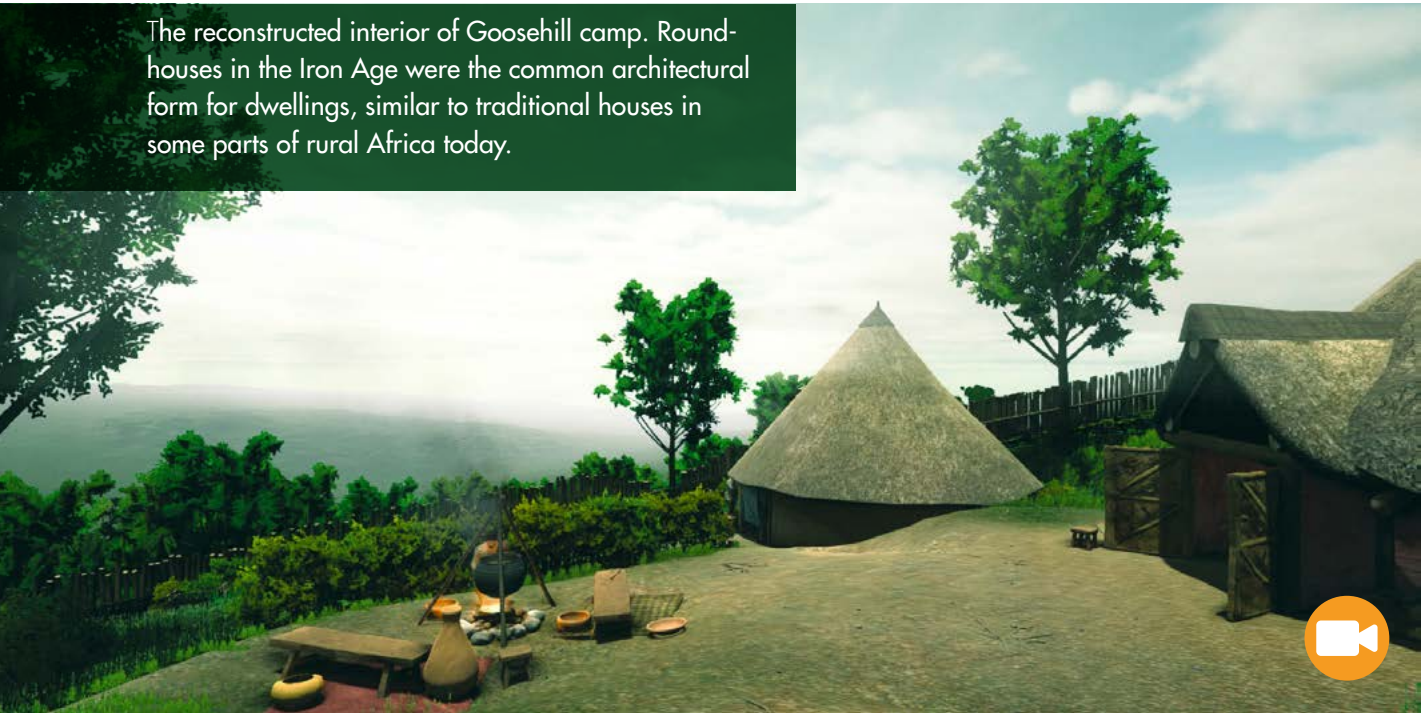
Armed with the LiDAR modelling data and the archaeological evidence, we began to weave together a story offering a snapshot of daily life in an Iron Age settlement, detailing how its residents went about their lives. It brought with it many questions and challenges, but it has been a fascinating process, making amateur archaeologists of the whole team.

It was decided that Goosehill settlement would be one of three project discoveries that would be recreated as a 360° interactive experience. This allows visitors to the Secrets of the High Woods travelling exhibition to walk around a virtual Iron Age settlement and really experience what it might have been like to live there.

> It gets through in different ways to different types of people, so it does work as an exhibition. It's very well done.
> Ernestos Karydis, Arundel Museum Manager

We started with the basics – the LiDAR terrain data that shows us the modern topography of the site and the archaeological evidence that has been left behind. Of course, the modern-day terrain holds merely weathered remnants of what were originally much bigger Iron Age features. Two millennia and more of erosion have gradually filled in ditches and diminished surrounding banks. Despite the fantastic accuracy of the actual LiDAR models, we've had to apply a little artistic licence to help visitors to the Goosehill virtual settlement get a feel for how it might really have been.

As a starting point our modellers created a 3D mesh from the terrain data. Then, based on expert opinion, they gouged out the ditches a little more, built up the banks and began



The reconstructed interior of Goosehill camp. Round-houses in the Iron Age were the common architectural form for dwellings, similar to traditional houses in some parts of rural Africa today.

Inside a roundhouse the circular space must have encouraged communal living. A central fireplace was used for warmth and cooking, in this instance an iron container suspended from the ceiling was used.

populating the scene with buildings and structures for which there is evidence, but no clear detail.

> Fantastic technology used in a creative way it is a great way to get the younger generation in archaeology.
> Visitor to the exhibition

Once the buildings were created, they needed to be dressed with all the paraphernalia of life in the Iron Age: pots, tools, fabrics, seats and tables were researched in detail and then meticulously created, first by sculpting them in 'virtual' clay, then applying textures, colours and lighting to make them look authentic.

In order to allow visitors to explore the scene themselves, rather than simply watching a 3D animation, everything in the scene needed to be created in a particular way for incorporation into a gaming engine. This approach brings with it its own set of challenges, as the models need to be detailed enough to look authentic, but also light enough (in computer processing terms) to allow the graphics to run smoothly.

> Accessible, family-friendly, engaging, exciting, vivid, gorgeous, cutting-edge technology and rich history presented in a clear, concise way.
> Visitor to the exhibition

Once all the buildings, structures, fabrics, pots and pans were created, we then needed to create and animate a family group who may have lived at Goosehill, along with the animals that they kept there. Again, the characters were moulded in clay and textures and colours were applied before they were 'rigged' for movement by the insertion of virtual bones and muscles.

Once these bits of the jigsaw had been created, we positioned them within the settlement and added animation. A voiceover narrative was written and recorded, and ambient sounds were created and inserted to give viewers a sense of immersion into a tranquil, pastoral hillside landscape.

Many of the doorways found in Iron Age round-houses look out to the south-east. Archaeologists periodically have disagreements about what such an orientation signifies.

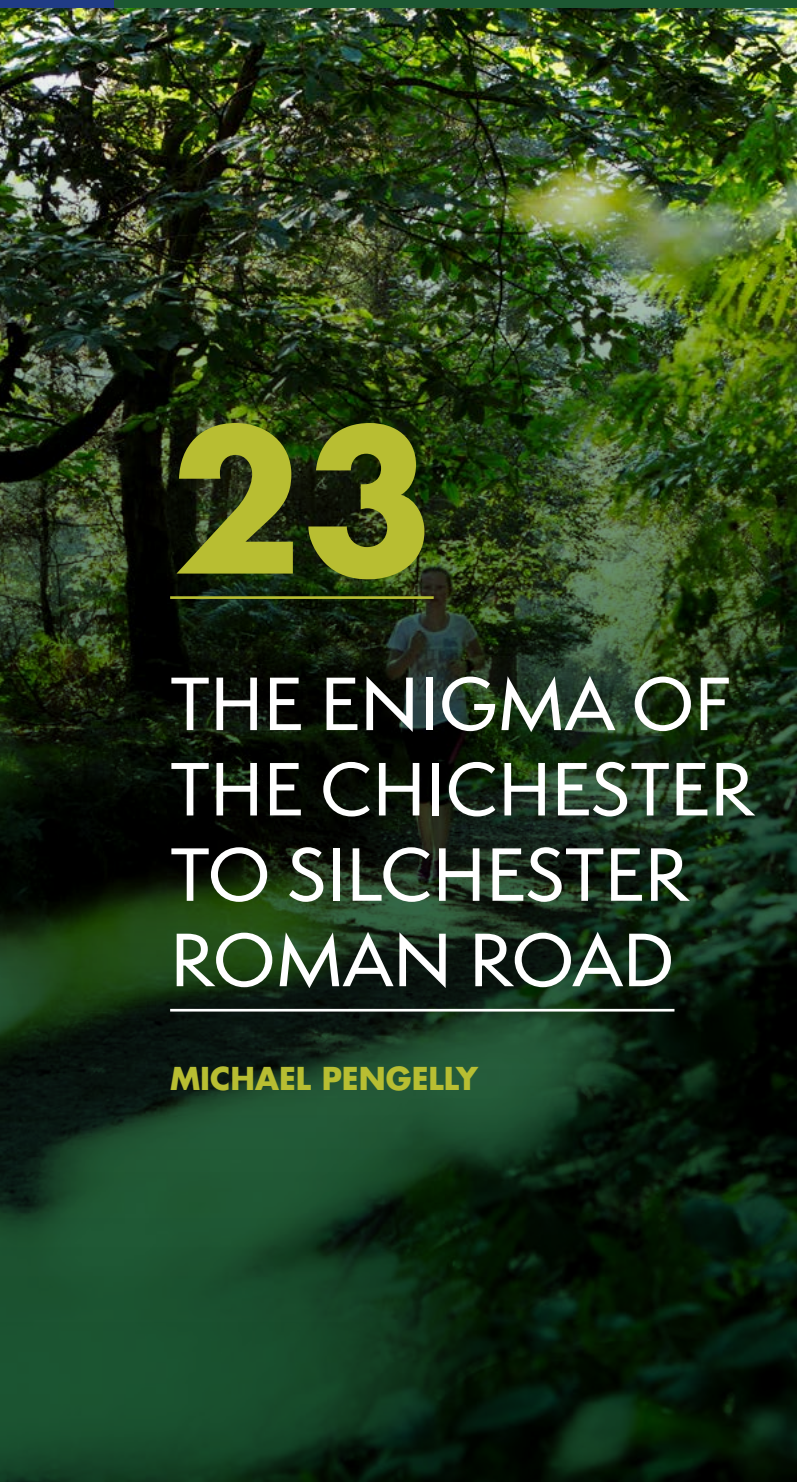
We've had great fun speculating about who lived at Goosehill and how they spent their days. The pebble cache discovered within one of the roundhouse platforms was a real bonus, allowing us to imagine a stash of sling-stones, with children learning this important Iron Age skill.

Creating the site has allowed us to challenge common misconceptions about ancient life. It's easy to assume dwellings might have been drab and basic, but there's no reason why parts of roundhouses wouldn't have been painted in bright colours with decorative motifs, using pigment produced from mineral or plant sources. Likewise, Iron Age clothing, made from wool and coloured with natural dyes, must have added further colour. Add in decorative carving that probably adorned significant timbers and you can imagine that any Iron Age settlement might have been visually very attractive.

Wherever possible the reconstruction of the site has been based on archaeological evidence and expert opinion. However, in order to illustrate many different elements of Iron Age life, we've occasionally had to apply the adage 'never let the facts get in the way of a good story'. For example, there is no firm identification of a well on the site, but, as there is evidence from some other Iron Age settlements that water would have been drawn from the ground with leather buckets, it was agreed that this would be a good activity to include here.

Our role in this project has been to engage an audience, who may have no previous archaeological interest or experience, with the discoveries of the Secrets of the High Woods project and the stories of this ever-changing landscape. We hope that, by allowing visitors to step back in time to a virtual past, we've achieved that. We've certainly learned a lot and all of us will never look at a bump in the ground in quite the same way again!

Local schoolchildren at the opening of the Secrets of the High Woods exhibition in the library of the South Downs Centre, Midhurst, 8 June 2016.



23

THE ENIGMA OF THE CHICHESTER TO SILCHESTER ROMAN ROAD

MICHAEL PENGELLY

DURING HIS LIFETIME, IVAN MARGARY (1896–1976) travelled over 20,000 miles of Roman roads in Britain and became such an established authority that even today Historic England still uses his system of identifying roads by catalogue numbers. For example, Stane Street, which connected the Roman towns of Chichester and London, is formally known as Margary 15. In his seminal survey of Roman roads he identified four roads radiating from the walls of Chichester and, of these, the one running the forty or so miles to Silchester (Margary 155) is perhaps the most intriguing. It was discovered only through an analysis of aerial photography which revealed a Roman *mansio* or posting station at Milland, which meant that such a road existed.

Further analysis by Margary and others suggested that the road started at the north gate of the Roman town of Chichester (*Noviomagus Reginorum*) and headed north through Heathbarn Down to Bow Hill, where it crossed the South Downs ridgeway, then down to Fitzhall Heath before fording the River Rother at Iping. It then passed close to the Iron Age hillfort at Hammer Wood, leading to the *mansio* at Milland, just past Dunner Hill. At this point it headed north-west, ultimately joining the Winchester to Silchester Roman road a mile short of Silchester (Margary 42a). Most of this analysis of the road alignment was carried out through the interpretation of aerial photographs and historical maps, supplemented by walking the ground. It is not surprising, therefore, that this route has been subjected to subsequent reanalysis, particularly concerning the connection between Chichester's north gate and Heathbarn Down.

Heathbarn Down is situated approximately nine miles north-east of Chichester and lies on a spur of the South Downs between two alluvial coombes. These separate it from Bow Hill to the west and St Roche's Hill to the east. Early aerial photographs revealed a tramline-like linear feature eight metres wide between ditches twenty metres apart crossing the down on a north-west–south-east alignment and ending at a prominent chalk pit. This suggested the agger, or raised bank, of a Roman road, but its progress beyond this point was unclear. As a continuation of this line in the same direction would not lead to Chichester's north gate, Margary surmised that there had to be a realignment of the road at some point and he considered this to be at the junction of Old Broyle Road. Significantly, this route would have breached the earthworks of the Chichester Entrenchments or Dykes at two points.

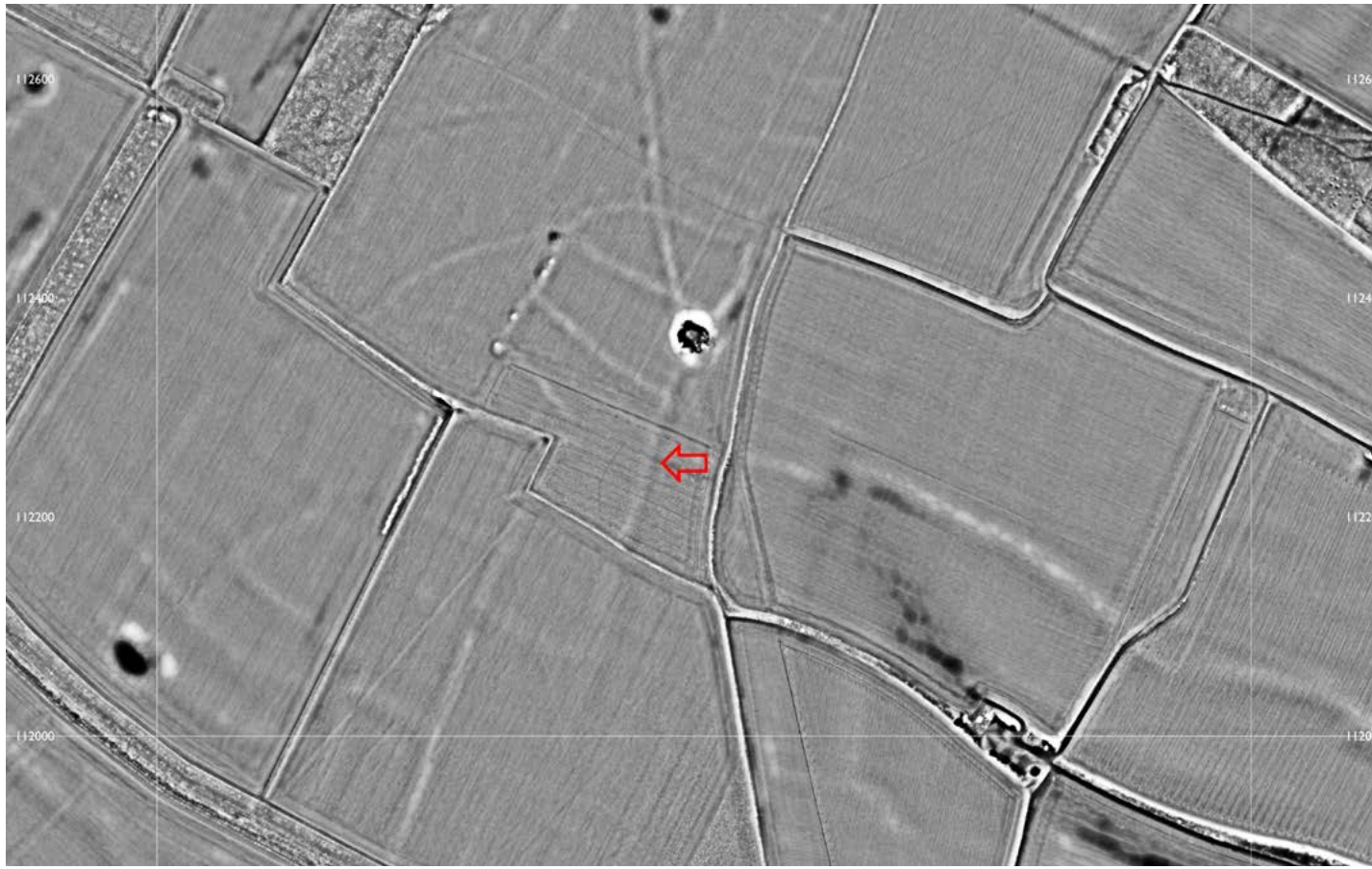
However, subsequent excavations by Richard Bradley could find no trace of such a breach and on the basis of later aerial photographs he suggested that the realignment actually happened close to the chalk pit referred to above. This is the alignment used on current OS maps but, importantly, no material evidence has yet been found to support this route either.

The absence of such hard evidence raises some interesting questions. For example: was there a realignment and, if not, where did the

road go? In this last respect it is interesting to note that if the road was projected on its original course it would head straight for Pagham Harbour. Perhaps this was its starting point? If so, could this suggest that its construction predated the existence of the Roman town, which, by implication, might tie the road in with the events associated with the Roman conquest or annexation of AD 43? But what about other possible realignments? Indeed, satellite imagery suggests that there was one such change below the chalk pit referred to above. Intriguingly, if this linear is projected, it will head straight for Bosham Harbour. This could also be seen as a possible candidate for the landing of a Roman military force.

> I was given the tractor to use and I used to go over there and do all the mowing of the rides, and up Stane Street … . You can just see the straightness of it and it was sloped. And it just came up into like a flint top and then you could see how all the bumps were going over and over. They didn't go round anywhere. It was just a straight road up and down. By the time I got to the end I was seasick on my tractor.
>
> Toni Barrow

Now it is true that prospecting for Roman roads is a task that has ended in tears for many archaeologists. But luckily we now have the luxury of the Secrets of the High Woods LiDAR data set to help prevent such upsets!

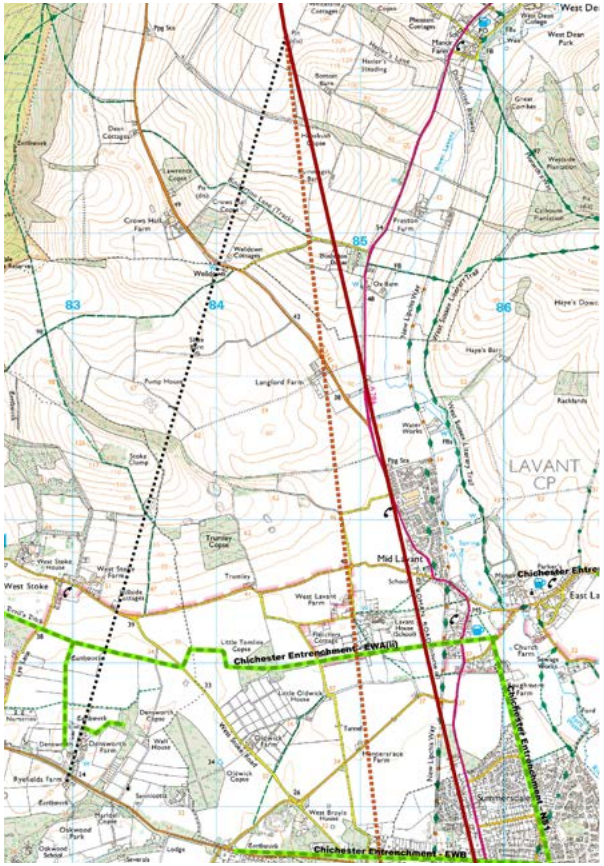


The red arrow on this LiDAR image points to what was initially thought to be evidence for the change of direction of the Roman road to Chichester.

What it reveals is that the linear below the chalk pit is actually not a road at all but was part of a large field system that straddled Heathbarn Down.

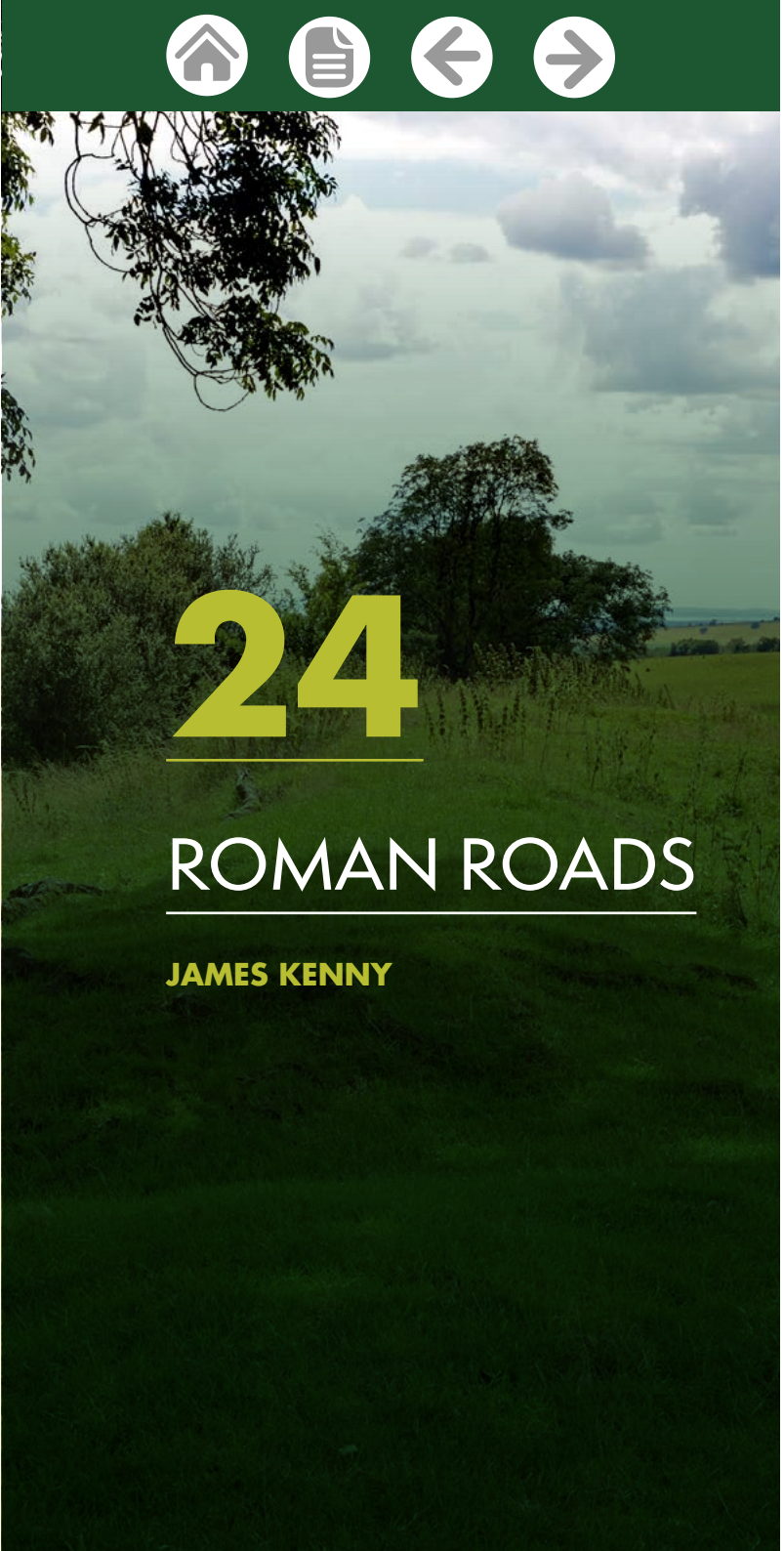
It was difficult to determine the chronological relationship of the field system to the proven section of the Roman road from the LiDAR image. However, subsequent analysis of aerial photographs clearly shows that the field system cuts through the Roman road and therefore the road is the earlier feature.

An aerial photograph of the area around the chalk pit (dark circle centre right) appears to show an earlier linear feature interrupted by the pit and then continuing to the bottom of the image. A field system seems to run across, and is therefore later than the linear feature.



The straight red line to the right is the assumed line, by the Ordnance Survey, of the Silchester–Chichester Roman road. The dotted orange line is the preferred route championed by Ivan Margary. The dotted black line, further west, is the projection that heads for Bosham Harbour. The dotted green lines at the bottom of the image indicate the Chichester Dykes or Entrenchments, of presumed Late Iron Age date.

Extending the area of LiDAR analysis over all of the various projections mentioned above failed to find any supporting evidence of the road's course after Heathbarn Down. This does not mean that its terminus was the chalk pit. It is quite likely that any signs of the road could have been ploughed out in subsequent agricultural use. But what it does mean is that the enigma of where the road actually goes continues unresolved. This aside, this analysis has proved a useful test of the capability of the LiDAR data set. The high resolution of the Secrets of the High Woods data provides an invaluable tool for carrying out rapid archaeological prospection of a large area. Used in conjunction with other tools, such as aerial photography and satellite imagery, it provides a means of enhancing the quality of research prior to going out in the field. That saves time … and tears!



24

ROMAN ROADS

JAMES KENNY

MANY A YOUNG ARCHAEOLOGIST HAS PLAYED WITH PENCIL AND RULER AND OS MAP, drawing straight lines between monuments and wondering if there's a hidden order to the landscape; but most soon learn to treat Watkins' *Old Straight Track* and 'ley lines' as pure fiction. However, it's well known that Roman roads do run in straight lines, and through the High Woods we find the example of Stane Street, which runs arrow-straight from Chichester to London – or at least from Chichester Harbour to a settlement and a crossing of the River Arun at Pulborough. From there to London it wanders about a bit. It's obvious that an important town such as Chichester would have been connected to other Roman centres by a network of Roman roads, so it should be a simple matter to identify others, shouldn't it?

In fact, there is archaeological evidence for the lines of Roman roads from Chichester to Winchester, Silchester, London and Selsey Bill, the latter presumably to a port now lost to coastal erosion. And it's certainly true that they are made up of a series of straight sections that were clearly surveyed by engineers who appear not to have worried too much about upsetting the locals. Look at the way Stane Street runs diagonally across the field systems at The Gumber, north of Slindon; and the Silchester road may do the same on Heathbarn Down, near West Dean. It seems that there is conclusive evidence that many of these field systems are pre-Roman, but what dates in the Roman period are the Roman roads and mightn't the fields on either side have continued to be in use afterwards? The LiDAR data will help to enable a reassessment of the significance of the Roman roads, but one of its greatest individual successes has been the identification of a 'new' route between Chichester and Arundel.

The existence of a Roman road running east across the coastal plain from Chichester was for many years a generally accepted archaeological fact, but firm evidence of its precise route has remained elusive. In recent years its justification – 'there ought to be a road so it must be there' – has seemed less plausible. The situation was best summed up by S. E. Winbolt, writing in the early 1930s:

> The whole of the coastal plain from some distance west of Chichester to Brighton shows plentiful signs of [Roman] occupation, and the remains of many dwellings have been found between Arundel and Brighton … There must have been east-to-west roads both north and south of the downs … . Archaeological evidence for these roads is slight, but the requirements of circumstances must be allowed fair play.

Various possible routes have been published over the years, but the most authoritative was by the renowned Ivan Margary, who, writing in *Sussex Notes and Queries* 11 (1947), outlined the key characteristics of the coastal road:

Stane Street near Gumber Farm and Bignor Hill. The line of this particular Roman road was probably surveyed by military engineers. The road cut a swathe through many prehistoric fields.

(a) it must be clear of the downland hills;
(b) it must avoid low wet ground;
(c) it must be reasonably straight.

The most likely route would therefore follow the modern road between Westhampnett, just east of Chichester, and Arundel, apart from a detour south of Aldingbourne House and between Avisford and Arundel Gasworks. Margary proposed a crossing of the River Arun by ferry to the end of The Causeway near Arundel Railway Station and a continuation eastwards to a similar crossing of the Adur at Old Shoreham. But the lack of hard evidence has led most recent authorities to doubt its existence, and modern maps of Roman Sussex don't show this route at all. As part of the National Mapping Programme, however, the Historic England remote sensing team has established that there is, on the contrary, compelling evidence for the road. Fortunately it doesn't follow too closely the modern A27 and there are still places where archaeological remains survive (see LiDAR image in Chapter 20).

Down on the coastal plain, cutting through Eartham Wood to the east of Chichester, you can walk along the same road that Romans walked almost 2000 years ago – Stane Street.

So let's take a journey along this newly discovered Roman road. The route leaves Stane Street at Maudlin (just north-east of Chichester), near the site of a medieval leper hospital, following the old Arundel Road until it rejoins the A27 at Temple Bar roundabout. From there it shares the same route as the A27 until East Hampnett, where it then follows an old loop of the road near Crockerhill. From then on, the route can be followed as a slight causeway across former parkland south of Aldingbourne House (around seven kilometres east of Chichester), detectable on the LiDAR data, and in the cropmarks of parallel ditches about twelve metres apart in arable fields north and west of Hales Barn Farm.

More earthworks are visible on the LiDAR at Westergate House, on either side of Fontwell racecourse, and at Barn's Copse and Brick Kiln Copse, near Binsted. The best-preserved portion is an almost continuous section 1.6 kilometres long through Binsted Wood, just west of Arundel (see Chapter 32). In part it survives as a slightly raised carriageway, occasionally with ditches about ten metres apart, and in part as a former drove-way known as Old Scotland Lane. This rejoins the A27 at a prominent bend just south of Arundel Cricket Club, where it becomes Chichester Road, which then curves down the hill towards the Arundel bypass roundabout on the west side of the town.

Whether the route continued eastwards by ferry across the river Arun, as Margary proposed, or whether 'causeways were built out as far as possible and … ferries were provided between the terminals' (Barry Cunliffe), is difficult to determine. It seems unlikely that the road ran along the shallow bench of dry land now occupied by Tarrant Street, because its full width seems to have been occupied by a significant and early Roman villa. Perhaps the route ascended the sharp slope into what became the medieval town of Arundel, through its Water Gate and along what became Maltravers Street, before turning south-east at the High Street to cross the river at the traditional bridging place.

It has been speculated that the early Roman roads connected maritime landing sites, and it is possible that the road between Westhampnett and Arundel was originally intended to connect the Roman port at Chichester Harbour with another on the Arun at Arundel. However, although the Secrets of the High Woods LiDAR data doesn't go beyond Arundel, evidence mainly from aerial photography is emerging for a road close to the line of the A27 running east of the Arun beyond Poling Corner. If this represents a continuation of the Chichester–Arundel road it's difficult to imagine that it doesn't go even further eastwards, even if there's no equivalent to Roman Chichester in East Sussex. As Cunliffe pointed out, the route

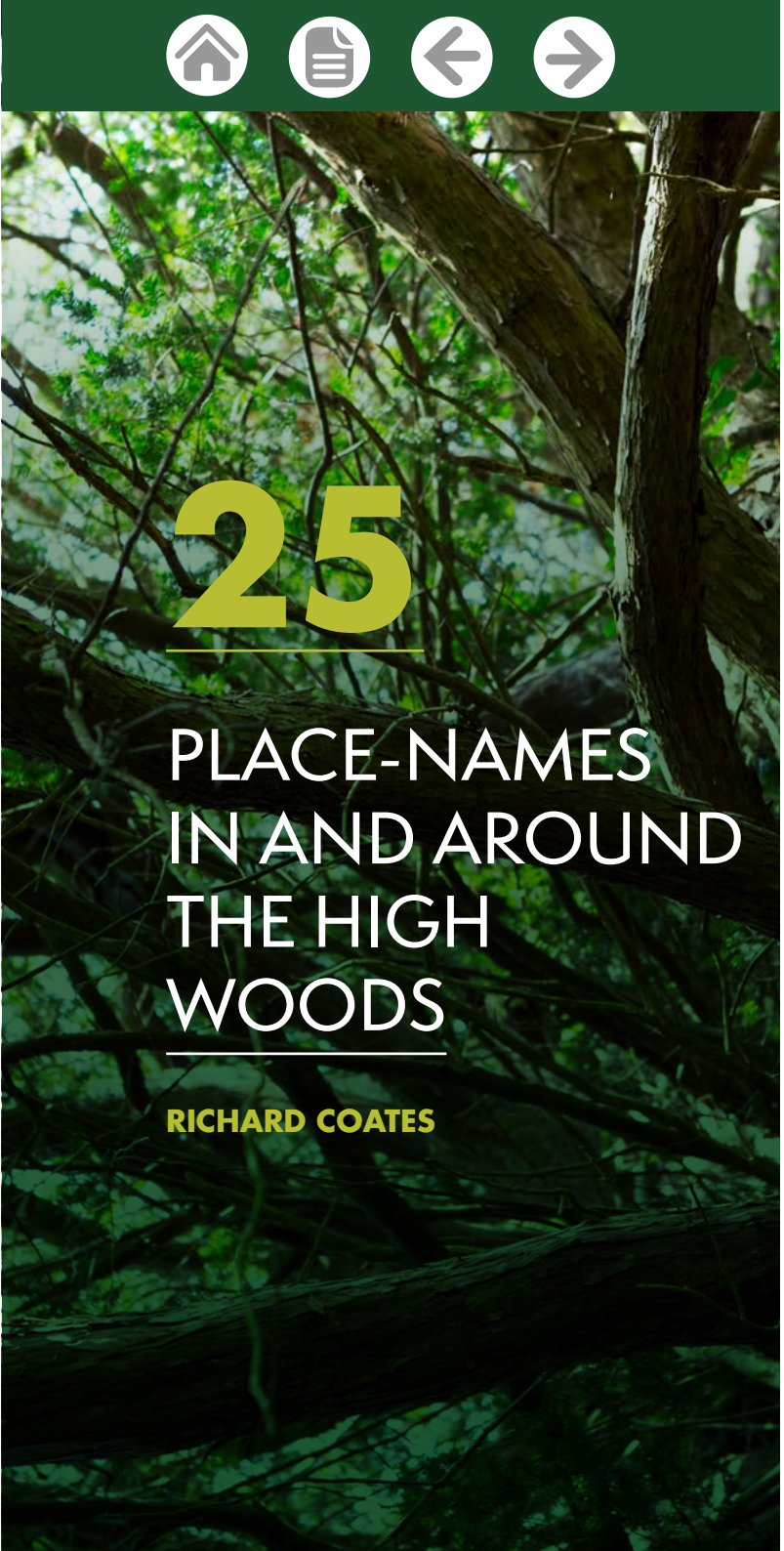
> may well have been constructed to link the corn-producing Downland and the iron-rich Weald district direct to the capital. After all, by Roman road the East Sussex Downs were as near to London as they were to Chichester, and to have carted iron from the Weald to Chichester rather than London would have meant an extra half day's journey. In this simple observation may lie the reason why no major urban centre developed in East Sussex – the area was strictly within the economic hinterland of London.

Whatever the ultimate destination of the road there's no doubting the skill of the Roman engineers in establishing a route that is still largely in use today. Perhaps another example of their ability to get the best advantage out of the land lies in the way the line runs very close to outcroppings of the Slindon raised beach, whose sand and pebbles would have made very useful materials to metal the road's surface. It is possible that some of the many old extraction pits in Binsted Wood that seem to follow the newly discovered road were dug for exactly this purpose! As ever, we must await further archaeological investigation to be sure.

If there's a lesson worth learning in this, it's that one shouldn't ignore the advice of Ivan Margary, whose route, published over sixty years ago, has after all proved so accurate. Despite the high-tech wizardry of computerised recording systems and analytical mapping software in archaeology, it seems the old combination of ruler and map – supported by good archaeological observation and field skills, of course – still has some life left in it!

Watch a short video about how the Roman roads were discovered.

The grass-covered bank to the right of the fence, running up to the top of the hill, is the remains of the Roman road known as Stane Street. The road linked Londinium (London) with Noviomagus (Chichester).



25

PLACE-NAMES IN AND AROUND THE HIGH WOODS

RICHARD COATES

THE VAST MAJORITY OF THE MOST PROMINENT PLACE-NAMES OF THE NATIONAL PARK AREA, those of villages, manors and some farms, date from the Anglo-Saxon period and were formed in the Old English language. Their original meanings can usually be worked out by looking at the earliest spellings we can find – often dating from Domesday Book of 1086 or even earlier – and comparing what we find with known words and structures of Old English.

Place-names fall into two broad types: those which describe landscape features (hills, valleys, streams) and those to do with farming, relating either to the practice of farming or other land-uses, or to those people who farmed the land in early times. Descriptions of the land give rise to patterns involving a small number of recognisable chunks at the end of names. Some common Old English ones include *mere* 'pool' (as in Tangmere, Falmer, Linchmere), *dūn* 'hill' (as in Marden, Hambledon and War Down), *denu* 'long narrow valley' (as in East and West Dean, Finchdean), *cumb* 'short valley, often with a bowl-shaped end' (as in Molecomb, Malecomb, Coombes), *feld* 'open country not sown with crops' (as in Clanfield and Henfield – most of these are off the actual downs), *hyrst* 'wood, especially one on a hill' (as in Midhurst, Madehurst, Selhurst), and *grāf* 'grove', often a stand of trees of a single species (as in Boxgrove).

Another sort of useful land was *lēah* 'woodland, clearing in a wood' (rare on the downs themselves, but as in Amberley).

The first parts of these names are a varied lot: some are terms describing a feature of the hill, valley or wood, so Tangmere means 'paired or adjacent pools', Pyecombe probably 'gnat valley' and Fernhurst 'bracken wood'; Clanfield is 'clean or cleared land'; Marden means 'boundary hill'; Chilgrove is 'grove by a feature resembling a throat' (the steep-sided valley of the B2141); and Amberley is 'clearing frequented by buntings'. Others include personal names (most often male) dating from the time before traditional 'English' Christian names were widely used, so Tortington is named from a man called Torht(a) 'shining', and other ancient personal names can be found in Cocking (Cocca) and Walderton (Wealdhere).

Farming names tend to end in words describing the size and kind of enterprise that existed in the early days of England, and include *hām* 'major farming estate', *tūn* 'farm or village' (which often amounted to the same thing), *wīc* 'farm or outfit with some sort of specialism' and *worth* 'small farm, smallholding'. *Hām* is a problem, because it's easily confused with names originating in *hamm*, which is a landscape word for land by a river or in a river-bend or enfolded in some other way. It's likely that Burpham 'hillfort farm', Eartham ('ploughland farm' or 'farm with an animal's lair') and Upwaltham 'upper woodland-farm' are named with the farm-word but Offham 'Offa's riverside land' and Apuldram 'riverside land with apple trees' probably with the landscape word. In the cases of Stedham (from 'steed', or from

a man's name consisting of this word) and Graffham (with 'grove'), we'll probably never know for sure which. *Tūn* is the commonest word appearing in older place-names, and it often appears with an Anglo-Saxon personal name in first place, with or without an *-ing-* in between: thus Bepton (Bebba or Bebbe, the latter a woman), Walberton (Wealdburg, a woman), Donnington (Dunnuca), Lavington (*Lāf*). Charlton is 'farm of the churls, members of the lowest rank of free peasants'. Some others are descriptive: Houghton 'farm by a projecting spur of land', Chalton 'chalk farm', Compton 'valley farm', and Stoughton 'farm marked by stumps or trunks'. Shopwyke is 'farm specialising in sheep'. *Worth* is found in Idsworth ('Iddi's farmstead').

Another conspicuous element is *-bury*, from the Old English for 'massive earthwork, fortification'. It appears by itself in Bury, and in Buriton it probably refers to the earthworks on nearby War Down. Beyond the project area we find several important ones, such as Owslebury 'blackbird earthwork'; Cissbury seems to be 'the latest earthwork', and Chanctonbury, originally Chankbury, seems to contain an earlier name for the fort itself. Mount Caburn near Lewes, despite many authors repeating a different and false story, is named in Old English from its hillfort, 'cold earthwork', but the name has been corrupted in recent centuries.

Returning now to landscape names: the biggest rivers flowing through the National Park mostly have names that are either extremely ancient or fairly recent inventions. The Itchen and Meon have names so old they are beyond definite interpretation. Cuckmere means 'live pool', which must refer to a feature that has disappeared – possibly a freshwater pool or even a pool close to the estuary that was replenished by the tide? The Ouse has an obscure name invented by a 17th-century poet, Michael Drayton. He also invented the Adur's name, based on a misunderstanding of a name in a Roman-period document. The Rother takes its name from the hamlet of Rotherbridge in Tillington. The Arun is derived in a similar way from Arundel; its original name was a British Celtic one, written in later times as *Tarrant*, possibly meaning 'the trespasser'.

Some names in the Park are just what they seem. Blackdown hill and Privett village seem to offer the promise of easy interpretations, and in these cases the promise is fulfilled. But not all are what they seem. Warningcamp is 'land with Roman features associated with a man called Wærna', whilst Boarhunt is 'spring with Roman features belonging to a fortified place (like a *bury*)'.

Let's finish with a few, either inside the High Woods project area or elsewhere in the Park, which illustrate some other types.

Arundel Old English for 'small valley or pit where the plant horehound grows'

Bignor Old English for 'ridge or hillslope belonging to a man called Bica'

Butser Hill Apparently Old English for 'hillslopes of a man named Briht'

Funtington Old English for 'farm associated with a romanised spring or well' – and Fontwell may name another such spring, but this appears in the record later

Goodwood Old English for 'the wood of Godgifu', a woman's name meaning 'good gift' or 'God gift', the source of the name of Coventry's Godiva

Halnaker A later, Middle English, name meaning 'half an acre' or 'half a measure of ploughed land', sometimes recorded as Halfnaked

Harrow Hill Harrow is from the Old English for 'pagan shrine or temple', and the same word may recur in Mount Harry near Lewes

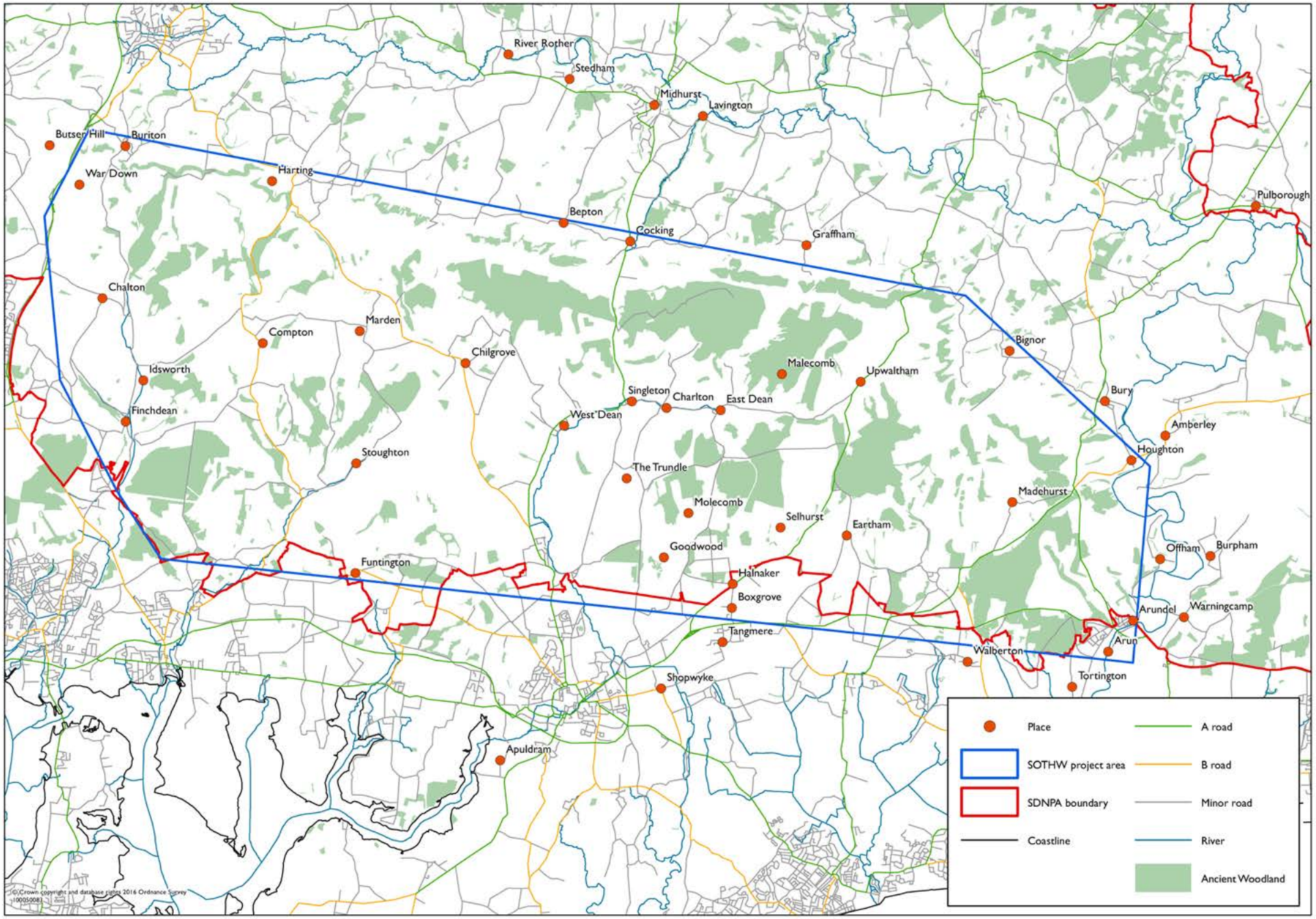
Harting Old English for 'people associated with a man named Heorot' (which means 'stag')

Liss From a word meaning 'court' in the British Celtic language spoken here before English

Pulborough Old English for 'the mound by the pools'

Singleton Old English for 'farm at the burnt clearing'

The Trundle Old English for 'the circle', referring to the earthworks here


River Rother
Stedham
Midhurst
Lavington
Butser Hill
Buriton
War Down
Harting
Bepton
Cocking
Graffham
Pulborough
Chalton
Compton
Marden
Chilgrove
Bignor
Malecomb
Upwaltham
Idsworth
Singleton
Charlton
East Dean
Bury
Finchdean
West Dean
Amberley
Houghton
Stoughton
The Trundle
Madehurst
Molecomb
Selhurst
Eartham
Goodwood
Offham
Burpham
Funtington
Halnaker
Boxgrove
Arundel
Warningcamp
Tangmere
Arun
Walberton
Tortington
Shopwyke
Apuldram
Place
SOTHW project area
SDNPA boundary
Coastline
A road
B road
Minor road
River
Ancient Woodland
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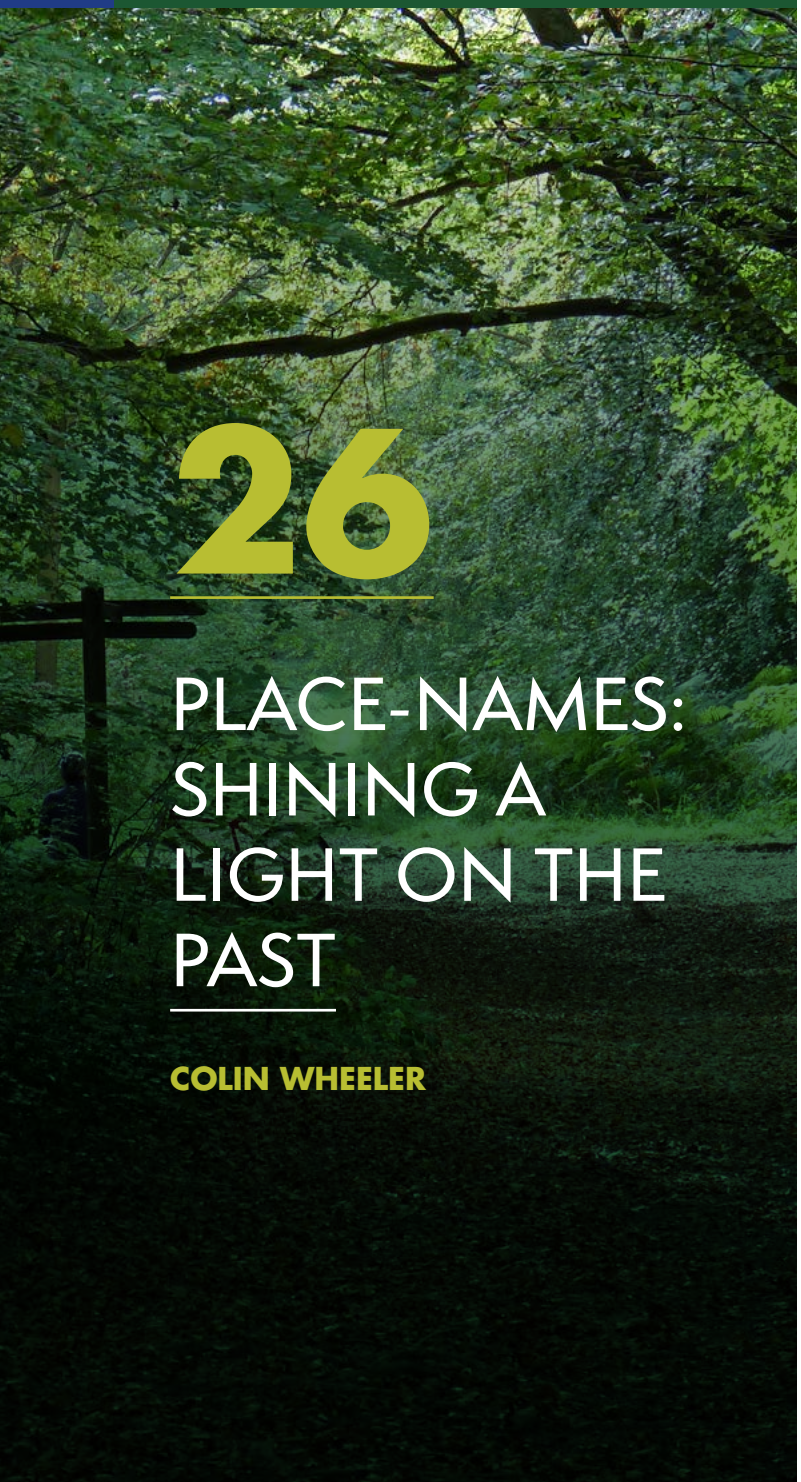


26

PLACE-NAMES: SHINING A LIGHT ON THE PAST

COLIN WHEELER

I BECAME INTERESTED IN PLACE-NAMES WHEN, AS A MEMBER OF THE SECRETS OF THE HIGH WOODS PROJECT TEAM, I was asked to look for place-name evidence for settlements and landscape features in the project area. I knew nothing about the topic at the time but in my attempts to understand the development of names over time I was suddenly plunged into a world of ancient documents and linguistics. It was fascinating to see how place-names shine a light on the past, although the derivation of a name can sometimes remain pretty much a mystery in spite of the best efforts of scholars.

One part of the project was to prepare data for an interactive map of place-names from books and online sources that gave the most likely explanations of how names developed. Looking through various reference books I was surprised to see lists of different spellings for places that I naively thought had not changed much through the centuries. Part of the reason for this complexity, as Margaret Gelling pointed out, is the succession of languages spoken in the British Isles, which have, to a greater or a lesser extent, influenced the development of place-names.

The earliest language scholars recognise is a non-Indo-European language of which Pictish is an example. This was followed in chronological order by Celtic/British, Latin, Old English, Old Norse and finally Norman French. Of these, Old English or Anglo-Saxon had the most influence on place-names in the study area, and this was evident from the data I gathered for the interactive map. Unlike more northern parts of England, Old Norse had little influence in West Sussex and, although the Norman invasion brought French to these shores, the language was not widely spoken amongst the general population.

Place-names really are both signposts to both the present and the past. Harting is Old English for 'people associated with a man named Heorot' (which means 'stag'). The hryst element of Midhurst means 'wood, especially one on a hill'.

What was also apparent early on in the project was that speculating on the origin and meaning of a name is interesting but it is simply an opinion until it is based on some documentary evidence. It is only when you delve into the world of Anglo-Saxon charters, Domesday Book (1086) and miscellaneous charters, rolls and other forms of evidence that there is some certainty about the form

and possible meaning of a place-name. You realise local names often change and that these changes are sometimes captured in a succession of historical documents. Let me give you some examples from the High Woods.

Binderton is first referred to in Domesday Book as Bertredtone and later, in 1691, as Binton in the Calendar of Wills in the Consistory Court of Chichester (The National Archives). The name means farm/settlement connected with Beornthryth, which is a feminine personal name.

The first record for Binsted is also in Domesday Book, where it is referred to as Benestede and later, in 1342, as Byenstede in the Calendar of Patent Rolls (The National Archives). The name apparently comes from *bēan* (Old English) a bean, and *stede* (Old English) a place, a site, a locality; a religious house or foundation; a place of communal activity; a farm, a dairy-farm, an estate. That's a pretty wide selection of meanings from one place-name, but often the local context or information from other sources will steer you towards the most probable explanation.

Sutton is mentioned as early as 880 as *Suðtun* in *Cartularium Saxonicum* (ed. W. de Gray Birch) and later, in 1331, as Sutton by Bygenyure (*Feet of Fines*, Sussex Record Society). Sutton means south farm/settlement and comes from *sūð* (Old English), south, southern, and *tūn* (Old English), an enclosure; a farmstead; a village; an estate (information taken from the *Key to English Place-Names* database).

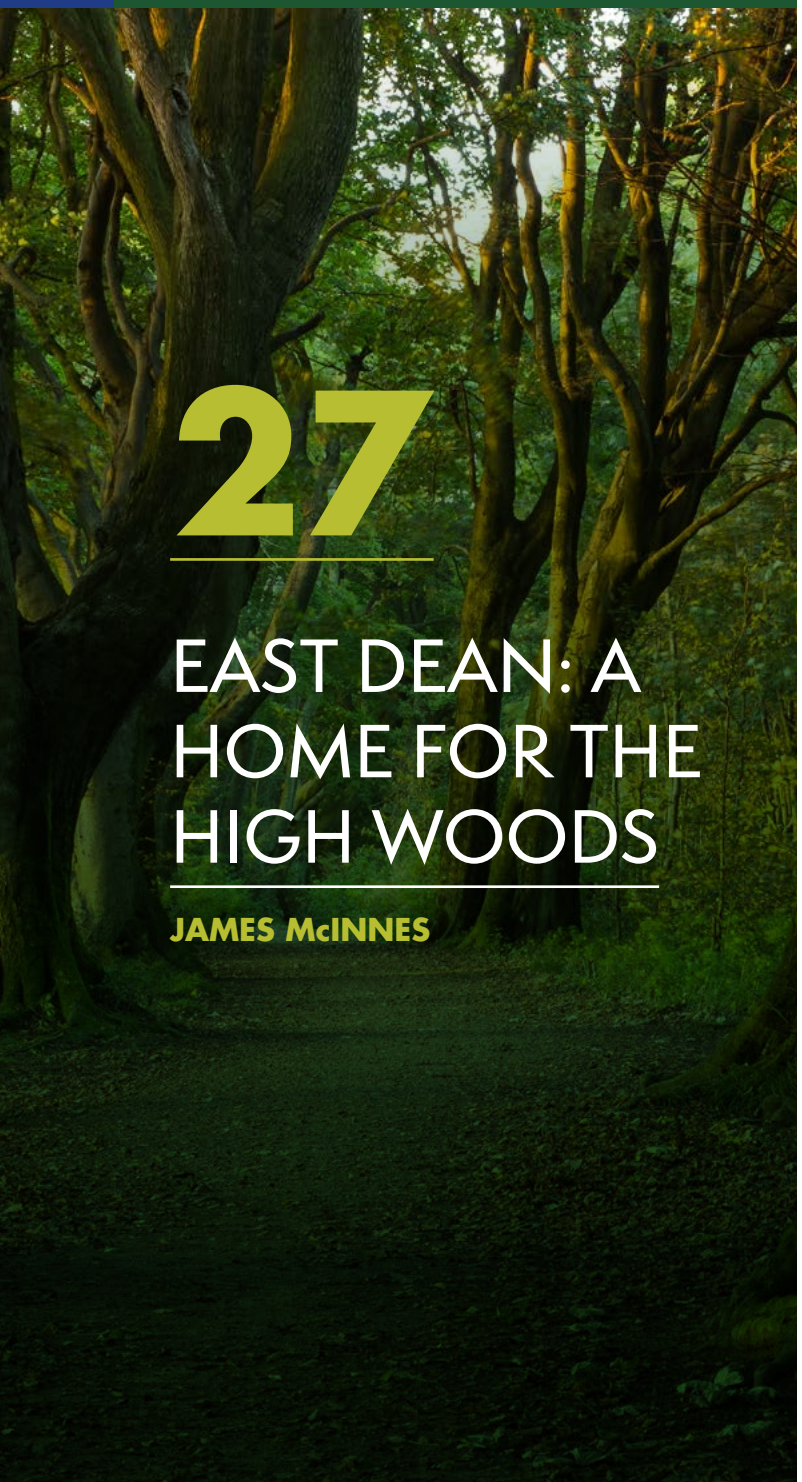
Studying place-names draws on several sets of skills but very often it is the linguists we have to turn to for the latest and most accurate interpretation of a name. Some very worthwhile reference sources have also been published, such as dictionaries of place-names or the publications of the English Place-Names Society.

For place-names more generally, two good online sources are *The Historical Gazetteer of English Place-Names* **placenames.org.uk** and *The Key to English Place-Names* **kepn.nottingham.ac.uk**. I can thoroughly recommend place-names studies to you. And I can also guarantee that you will never look at a map in the same way again. Behind every place-name lies a historical clue, and it's a joy to be able to find that clue and ultimately realise its significance for the past. If you do follow my recommendation and become a place-name buff, well, who knows – one day, you may be able to shine a brighter light on the past in your area too!

We've got a field called Bishop's Piece … in the wood that runs parallel. It's slightly out of the ordinary. It's called Little Heath Wood and it's got a cork oak in there, acacia trees, a lebanese cedar and the biggest Scots pine you've ever seen, and against all the other trees they do stick out. What the history of that is, I don't know, but they were planted in there for sure.
Adrian Hill

Road signs contain very useful information for travellers. But for those who know place-names they can also reveal much about the origin and history of our destination.

A picture-postcard image of the village of East Dean. The name Goodwood on the road sign derives from Old English for 'the wood of Godgifu', a woman's name meaning 'good gift' or 'God gift', the source of the name of Coventry's Godiva.



27

EAST DEAN: A HOME FOR THE HIGH WOODS

JAMES McINNES

AT THE VERY CENTRE OF THE SECRETS OF THE HIGH WOODS STUDY AREA LIES THE LITTLE VILLAGE OF EAST DEAN. It sits in a valley between the rolling chalk uplands of the South Downs and is surrounded by woods. East Dean was also a home for several High Woods activities. Many of the training sessions to help volunteers understand what they had to record and how to use the computer tablets took place in East Dean Park, and there were also surveys of the earthworks there. One of the features examined was a small mound. Without the LiDAR map in hand, it simply would not have been seen on the ground. It rose to a height of just 15cm, was about eleven metres across and – with the eye of faith (most archaeologists seem to have one of these) – it appeared to be surrounded by a slight ditch. LiDAR had almost certainly found a prehistoric burial mound.

The LiDAR map also showed two circular pits in East Dean Park. They were visited and surveyed by volunteers, who found that they were about eleven metres across and about three metres deep. Since the chalk thrown up from the holes radiated from the perimeters in a starburst pattern, the conclusion was that these were bomb craters. This site was less than one minute's flying time from Goodwood airfield, which was a Battle of Britain station during WWII, known as RAF Westhampnett. However, as is always the case in archaeological interpretation, some people were less convinced that these were bomb craters, partly because one of the craters had growing from its edge an oak tree that probably began its life in about 1930.

Lively debate took place in the field amongst volunteers about whether this depression was actually a bomb crater from WWII. As usual, there were arguments for and against.

East Dean also illustrates some of the frustrations of research. We knew that in 1964 a certain Miss Keef had excavated some of the buildings at the centre of the park, but her findings were never published and no-one knew where her notes were. Following an extensive search we still have no idea where her records are but we do know that Phoebe Keef was a fascinating character. She was born into an army family in Amritsar, India, in 1898, but returned to England for

her education. During WWI she served in the YMCA and St John Ambulance Brigade, and was also based in Trouville, France. Sometime later she studied under the archaeologist Sir Mortimer Wheeler in London and then carried out her own excavations.

> Miss Keef … used to sit on the side of the trench and she loved a Woodbine cigarette, and she'd sit there puffing away at the Woodbine. And I'd say 'Would you like a cup of tea?' 'No, just a cup of water.' And she used to bring a hunk of brown bread. She wouldn't let me feed her … . That's all she used to have and then afterwards she used to walk all the way back to Heyshott. So you could see what kind of lady she was, but first and last in her life was archaeology.
>
> Pearl O'Leary

Equally fascinating is the way she invented an alternative family history for herself when chatting to people who dug with her in the 1960s. As one said during an oral history interview: 'she was a small lady who had iron-grey hair and rosy cheeks. She had a posh voice (she said she went to Roedean), was softly spoken and very chatty. She used to hum a lot and sing under her breath. She always had a long-haired dog on a long piece of string, never a lead. Her father had cut her off without even the proverbial shilling because of her interest in archaeology and her refusal to be presented at court as her sisters were.' However, Miss Keef actually went to school in Wimbledon, her father had died when she was three years old, she didn't have any sisters and wasn't disowned.

One of the most noticeable features of East Dean Park is the bank and ditch that formed part of the boundary of the medieval deer park. When these features were plotted on the LiDAR map we were able to work out that the park covered 320 acres, but until the documents were examined we knew little more about the park. In fact, it turned out to be the first in the area and was mentioned in written records in 1189. It was probably the 1st earl of Arundel, in the 1150s or 1160s, who had the ditches dug, the banks made and a fence or pale placed on the top to keep his deer in.

The records show that the park held fallow deer and that most of the trees were beech (and that pigs were allowed to feed on the mast). There was a house or lodge in the park by 1331 and earls of Arundel were constantly complaining that people were breaking into the park and taking away deer. As late as 1570 the park had 200 deer and the fences were in a good state of repair. Eleven years later the deer were taken from the park to Stansted and the then owner, John, Lord Lumley, son-in-law of the 19th earl of Arundel, eventually sold the park to the ironmonger Peter Garton in 1589. The LiDAR shows that field boundaries were subsequently created within parts of the old deer park and maps reveal that this land was then ploughed.

A quiet corner of East Dean village. The house walls are constructed with coursed flint, locally and plentifully available from the surrounding chalk downs.

East Dean Woods was also the site of one of the community archaeology digs led by Cotswold Archaeology. One of the most exciting things that LiDAR has shown is just how extensive ancient field systems were on the South Downs. Secrets of the High Wood volunteers took part in a week-long dig to look at just one bank and trackway and try to get some idea about when they were constructed and what their purpose was.

> After the War, me and one or two of my mates at East Dean, we found a hidden hut/office dug in the ground. Bunks to sleep in, kitchen and everything. And we just stumbled on that by accident, so we made that our camp.
> Gerry Croucher

A view of East Dean village from just outside its medieval church. Note how the village lies in a sheltered valley in the downs.

Men and women who have lived and worked in the village and woods of East Dean were interviewed as part of the oral history project. For instance, a former manager of the Goodwood Estate's forestry department, David Laker, discussed coping with the devastation of the Great Storm of 1987 and explained why there are now so few beech trees on the estate. Some interviewees brought home the reality of everyday life. Susan Bovis talked about the fact that water had to be collected from a well at the top of the garden and that they only had a bath once a week, and the girls' disgust that they had to wash their hair in the insect-filled water from the rain-butt. Their voices remind us that archaeologists and researchers are trying to uncover people's past lives, but that we must not ignore those in the present who are able to tell us their own stories.

East Dean has thus been a suitable home for aspects of the Secrets of the High Woods project. It was used for ground-truth training, there were actual surveys of it, documents related to it were studied, people who have lived and worked there were interviewed for the oral history, a day's filming took place there and an excavation was undertaken, which subsequently appeared in the film and the exhibition of the project. However, only when all this work is linked together is it possible to start telling the story of East Dean.

The mounds, banks and ditches were made by the ancestors of the people of East Dean to bury their dead, mark the boundaries of their fields or keep the deer in. The LiDAR study has shown us where to start looking in our attempts to know and understand the life, times and homes of the ancient villagers of East Dean.

28

DEER PARKS: OF PALES AND POACHERS

JAMES McINNES

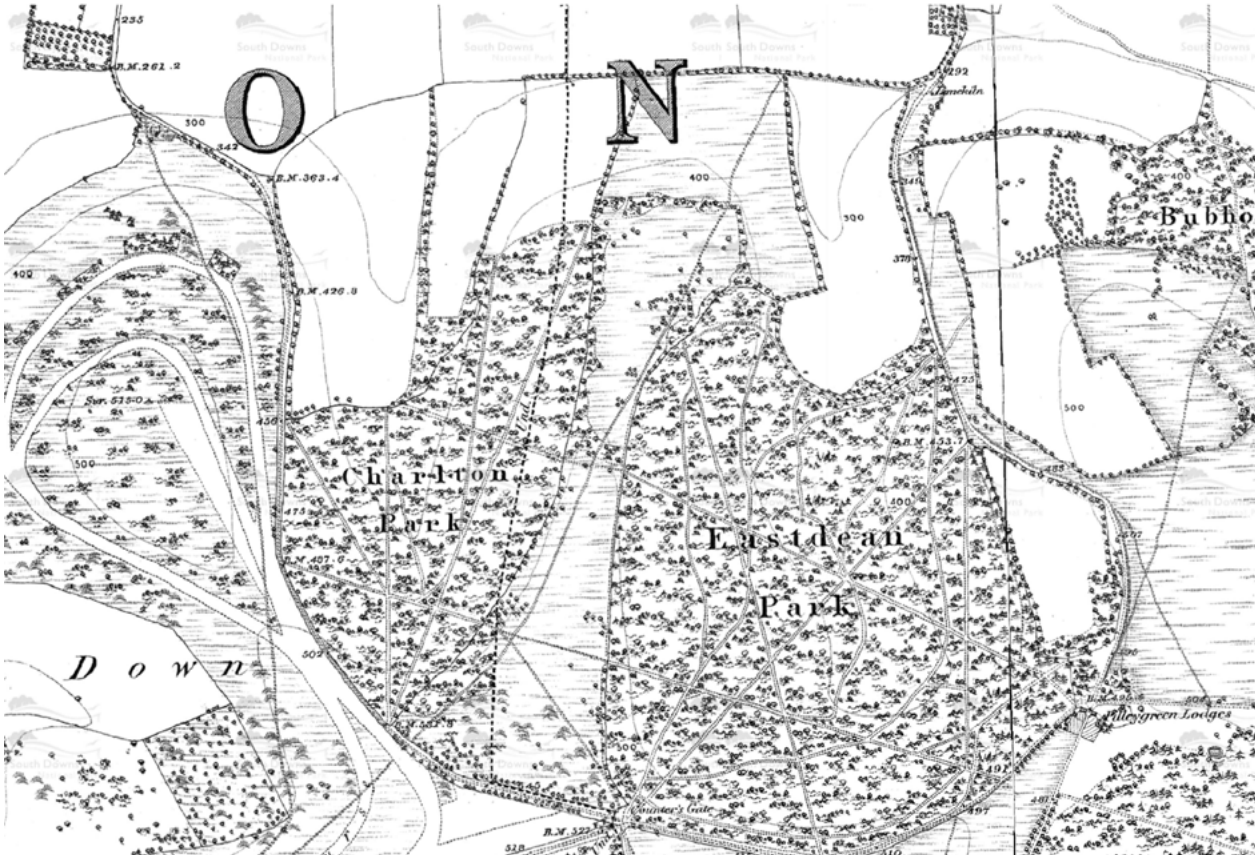
ONE BRIGHT MID-MARCH MORNING I WAS MINDING MY OWN BUSINESS walking along a trackway in East Dean Park, seven miles north of Chichester in West Sussex. I was part of a group checking whether the sites shown on the LiDAR map were of archaeological interest or nothing more than, for instance, a pile of old tyres left in the corner of a field. Alice Thorne, the LiDAR and Heritage Mapping Officer for the Secrets of the High Woods Project, asked whether I was interested in deer parks. Thankfully she ignored my answer and I joined the Secrets of the High Woods Research Group and began my investigations, which are summarised here.

> One of the biggest destruction machines is deer and there needs to be some major, major deer control … . It's just amazing the sheer number of deer that are here. I know a lot of people think, 'Yeah, lovely little Bambi', but unfortunately lovely little Bambi in a relatively short time can produce extra little Bambis and they really are a serious, serious problem for woodlands generally and certainly for coppicing.
> Chris Letchford

Hunting was a popular activity amongst the Normans and this led to deer parks becoming a dominant feature of the West Sussex landscape between the 12th and 16th centuries. As late as 1610 John Speed, in his county map, drew pales or fences around

This slight bank which runs from the bottom of the image, under the tree and then continues under the volunteers is all that remains of a pale or fence around the deer park in East Dean.

twenty-three parks in the rapes of Arundel and Chichester alone. Most of these were in the Secrets of the High Woods survey area. The variations in size of the parks suggest that they might have been used for different purposes. At only fifty-eight acres, Foldey Park in Lavant was the smallest of the parks, whereas the parks at Arundel were over 823 acres. However, deer parks were always multi-functional. Only



A detail from the Ordnance Survey map for East Dean deer park in 1874. Note the basic 'bag' shape of the park.

Downley (Singleton) and Arundel were big enough to be used for hunting on horseback, but in others 'bow and stable' hunting could have been carried out. In this method deer were driven, usually by dogs, to a place where the hunter could stand and shoot at them.

Parks were also places where deer – and in the LiDAR study area these were almost always fallow deer – could be bred, reared and fattened, so that they could be used either for stocking the forests and chases or as food for the larder. Gifts were an important part of medieval culture and to give venison conferred great prestige on the benefactor; deer parks enabled this to happen. Parks were also used for rearing game birds, as rabbit warrens, for pasture and for coppicing. The customs of the manor of places such as Slindon show that tenants of the manor were responsible for repairing and maintaining some of the fences. For them, as well as for gamekeepers, foresters, warreners and others, the parks were part of their working lives.

Although, in theory, all deer parks required a licence from the Crown, very few of them actually received one, so it is difficult to know precisely when they were set up. The earliest written record of a deer park in the LiDAR area was at East Dean in 1189, although it had probably been in existence for about twenty-five years by then. Most of the parks (Arundel, Cocking, Downley, East Dean, Selhurst, Stansted and Woolavington) were created by the earls of Arundel. However, archbishops of Canterbury (Slindon and Foldey Park, Lavant) and five families with local landholdings, St John (Halnaker), de Vilers (Treyford), de Gatesden (Elsted and Trotton), Husee (Harting) and West (Goodwood), also established parks.

Curiously, some of the earliest references to deer parks accompany accusations of poaching. Almost every park appears to have suffered from this and on some occasions it is alleged that gangs of up to twelve men were involved. However, since it was quite often eminent men, such as a dean of Chichester and a sheriff of Surrey and Sussex, who were said to have broken into the parks and taken away deer and timber, it is likely that many of these cases were brought simply to establish the rights of the owner.

A watchful roe deer in a wildflower meadow. The roe deer is primarily crepuscular, very quick and graceful, and lives in woods, although it may venture occasionally into grasslands.

A 15th-century illustration from *Le Livre de la Chasse* (The Book of the Hunt) depicts hunting red deer with dogs.

Usually parks had boundary ditches with a pale or fence on top of the bank. These show up clearly on the LiDAR maps of parks such as East Dean. However, written records confirm that parks, such as those at Halnaker, Slindon and Stansted, often had hedges as a substantial part of their boundaries and these are not revealed by LiDAR. Since the commonest tree in the parks was beech, it is likely that the hedges would also have been beech.

> When I was a kid we never got fallow this far down. They were always the top end of the village or across the top of Selhurst Park, but now they're down past us and they're now going down over what we call the thicket road into the fields down there. And it's nothing … to see … twenty, thirty at a time easily. There's vast numbers of them.
>
> Adrian Hill

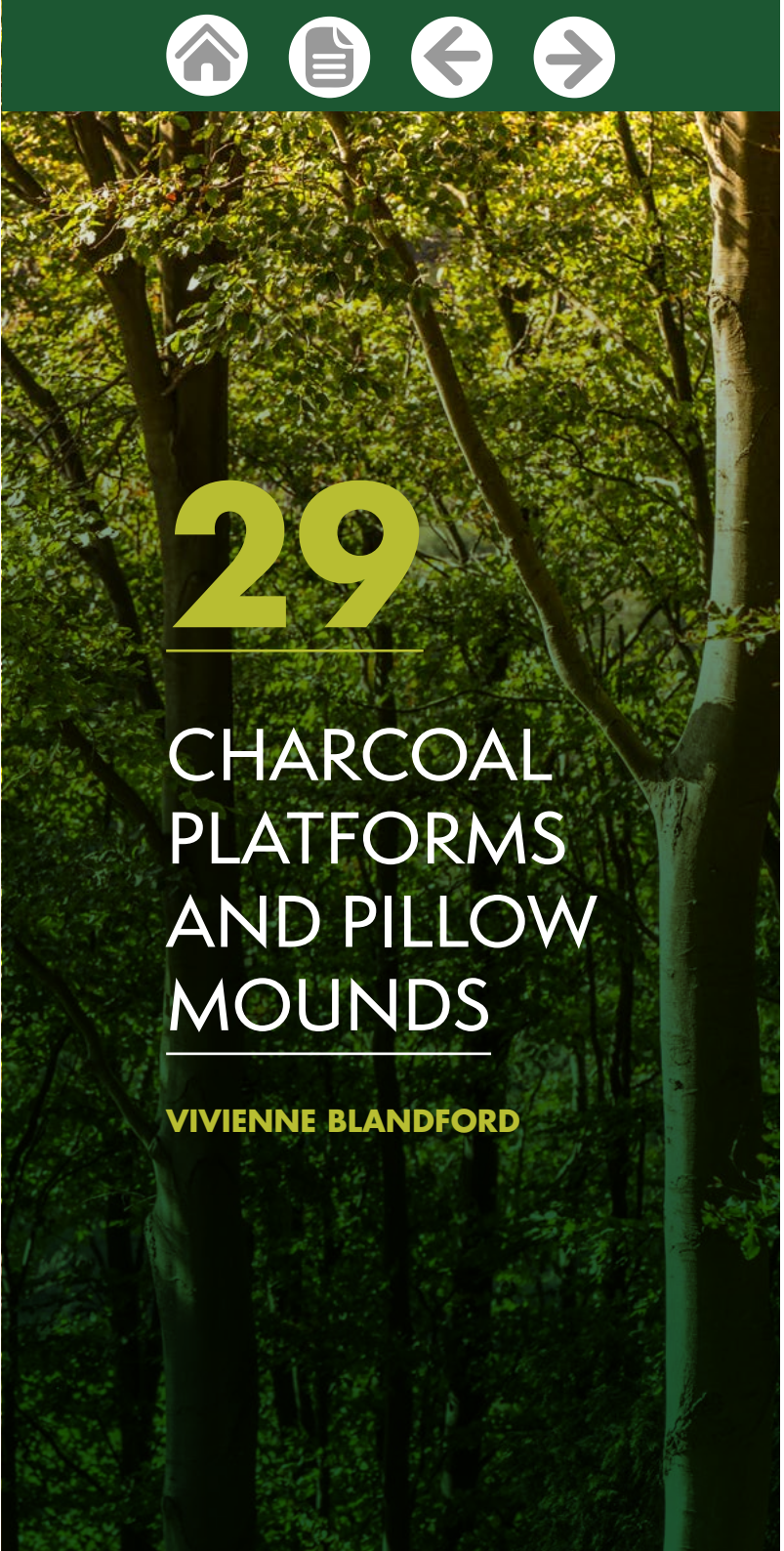
Like any other social and economic activity, parks went in and out of favour. When the fences and ditches were no longer maintained or deer were no longer kept the parks were said to be 'disparked'. There were two major periods of disparking. Deer parks at Elsted, Demesford, Treyford and Trotton (all in the area around Harting) and at Lavant and Slindon appear to have gone out of use in the 14th century. This might have been because there was not enough labour available to maintain their fences after the Black Death. Since most of the deer parks belonged to the earls of Arundel the reasons for their disparking are of special significance. They were being successfully managed when Henry Fitzalan, 19th earl of Arundel, died in 1580. His heir was his son-in-law, John, Lord Lumley. The earl of Arundel owed a great deal of money both to London merchants and Queen Elizabeth. One of the assets that Lumley had was land and the only way of repaying the debts was by selling land: he was responsible for the sale of eight deer parks.

The buying and selling of deer parks had started in 1578 when Giles Garton, who derived his money from the Sussex iron industry and was a significant figure in the Worshipful Company of Ironmongers, bought Woolavington Park. Both he and his son, Peter Garton, who bought East Dean Park in 1589, are examples of men who became wealthy thanks to profits from the rising industries of Elizabethan England. Two of the other deer parks, Bignor and Halnaker, were sold to men who were minor landowners with seats in parliament and political pretensions. Goodwood Park was also sold to a minor landlord, but Cocking was bought by Anthony Browne, Viscount Montague, who, like Lumley, opposed Elizabeth's religious reforms. The last of the sales took place in 1609, when Downley and Stansted were sold to men at James I's court. The earls of Arundel continued to hold parks at Arundel and Selhurst, both of which were being used for breeding and rearing fallow deer in 1606.

Throughout the medieval and early modern periods deer management had dominated the landscape and economy between Arundel and Petersfield. When this came to an end, largely because of the debts incurred by the earl of Arundel, the land was turned over to arable, pasture and coppicing, with a consequent impact on the lives of the local inhabitants. Some of the land within the parks became the subject of more intensive farming, which brought increased employment possibilities. It also meant that small parcels of land could be rented and farmed by men of enterprise.

This survey of deer parks and the significant suggestions about the main reasons for their disparking would not have happened without Alice Thorne's question and the LiDAR survey. Consequently, I now look for meaning in every bank and ditch, and I view the countryside more intelligently. For me, the Secrets of the High Woods project has a lasting and personal legacy.

Take a look at a 360° view of how East Dean deer park once looked.



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CHARCOAL PLATFORMS AND PILLOW MOUNDS

VIVIENNE BLANDFORD

IN RECENT YEARS THERE HAVE BEEN TWO WOODED LANDSCAPE-LED PROJECTS WITHIN SUSSEX: that of the Weald Forest Ridge and the Secrets of the High Woods. Both involved the use of LiDAR imaging to unlock their secrets, although there were notable differences in the archaeology found. This article mainly concentrates on that part of the High Woods project area which was once part of the Forest of Arundel, with its unusually numerous small-scale deer parks. Most of these parks had a perimeter of between 1.5 and 4 miles, whereas at Ashdown, or Lancaster Great Park, in the High Weald, perimeters ran to 23 miles in length.

> Nothing would have happened without charcoal. No iron, no smithing … . It's true – without charcoal there would have been no guns, no pots and pans.
> Alan Waters

The results of archaeology uncovered in the Weald Forest Ridge reflected a very different historic land use from that shown in the High Woods data, perhaps indicating a more continuous use of the High Weald as a deciduous wooded landscape. Ashdown Forest deer park was enclosed in the late 13th century and survived until the mid-16th century, in common with many of the deer parks in the High Woods project. It then remained largely unenclosed and in the ownership of the same family until the 20th century. The results from the High Woods project, however, demonstrate compellingly that here was an early farmed landscape, with its many field systems pre-dating the deer parks. Such fields were largely absent in the Weald Forest Ridge. In the High Woods a 12th- to 16th-century deer park landscape gave way to a mainly reafforested one managed by a few large estates.

Deer parks had multiple uses and were also used as an enclosed and private resource – for mineral rights, wood products, rabbit farming, sheep pastures and rights of pannage to graze pigs on beech mast. From the late 16th-century *Survey of the Honour of Arundel*, which lists details of all its deer parks, it is possible to get a small snapshot of what the landscape would have looked like in the 16th century and a few centuries earlier. It paints a very different picture from the contemporary landscape we were working in during the High Woods project when verifying features identified by LiDAR on the ground.

One park, Halnaker, had woods of ash and beech mixed with some young oak within seven separately named woods in which 'shovelers and herons have been bred'. Both shovelers (shovelards) and herons were fattened for feasting and their eggs were worth a massive eight pence in the 16th century. Selhurst Park contained mainly 'beech trees of old growth and much underwood and bushes therein'. In Downley Park, apart from 'ground given over to produce feed, suitable for sheep and deer', 'the chief part is grown with beech of 100 or 200 years old'. In Bignor Park 'the wood therein be old oaks set park-like and many of their tops seared'. Today there

An artist's impression of charcoal burners at work. Note the way the platform is terraced into the hillside. Such terracing can still survive for archaeologists to find.

is a distinct lack of older mixed deciduous woodland and the landscape is quite different, with its large swathe of forestry plantations and monocultural beech plantations with relatively little underwood.

Another archaeological difference is the relative absence of pillow mounds (for breeding rabbits) in the High Woods LiDAR survey (see Chapter 30). References to warrens, byries or berries – different names for those pillow mounds – can be found in the historic record. The term 'pillow mound' was coined by O. G. S. Crawford, an early pioneer of aerial photography, because these features looked bolster-like from the air. From the *Survey of the Honour of Arundel* comes this comment about Goodwood Park: 'lying on the north side without the said park to make "berries" for conies' and for East Dean 'Sir Thomas Palmer has the liberty of warren for 2 or 3 berees of conies upon the Downs of Watcombe'. In addition, Downley is a well-researched and well-known rabbit warren.

Conversely, from the Weald Forest Ridge there is scant historical documentary reference to the making or existence of rabbit warrens, but their archaeological survival is good and the LiDAR survey uncovered a large number of unrecorded pillow mounds. At Chelwood Gate a small enclosure contains three pillow mounds in varying forms and its southern boundary was once part of the pale of Ashdown Forest. It must be noted, however, that these pillow mounds of the Weald Forest Ridge were mainly of a later construction, dating mostly after the deer park was disemparked (or disparked) and making some use of already constructed enclosures that may have been part of the deer management process.

So why is there an apparent lack of their physical survival in the High Woods? Pillow mounds are very substantial structures and not easy to obliterate totally. Prehistoric barrows have survived to varying degrees on open downland and, in the woods, the ancient field systems survived being emparked and enclosed within later plantations. But pillow mounds do not seem to have survived in

A temporary woodland camp of charcoal burners. It was clearly an occupation for the whole family as this image illustrates.

A pillow mound near Rosamond's Hill, Stansted Park. The low linear mound, difficult to observe clearly in the understorey, has two coppiced trees at one end.

any number. Does it suggest that these 'berries' were of different, more insubstantial construction on the largely flinty chalk soils of the High Woods area? And that the heavier clays of the Weald provided material for more substantial pillow mounds? Or were the subsequent High Woods landowners just better at demolishing unwanted obstructions and, coincidentally, archaeological evidence?

Whilst we did find numerous examples of saw-pits in the High Woods, most probably dating from the 19th century, testament to woodland management *in situ*, what seems to be lacking is the presence of verified charcoal platforms. A charcoal platform can be round or ovoid and varies between eight and twelve metres in diameter. Cut wood was laid on the platform to form a 'clamp' which was then covered with turf, bracken or similar to prevent air getting to the wood inside. The platform had to be completely level and if terraced into a slope would have the back wall cut into the slope. In woods other levelled platforms were used for different purposes, including places to stack wood and small circular dwellings where the charcoal burners lived temporarily. However, it is the darkened soil, sometimes to a depth of up to 10cm, with small lumps of charcoal that confirms a feature as a charcoal platform. Good access to water was needed to quench any unwanted burn-out of the clamp during the charcoal-making process.

Whilst the National Mapping Project identified some features as charcoal platforms, ground verification proved otherwise. These charcoal platforms were a result of forestry

plantation fire clearances and possible WWII army-camp fires and tent platforms. These features were more irregular in shape, not entirely flat and did not have the compacted dark soil of genuine charcoal platforms. The volunteers tried, in vain, on numerous occasions to find the genuine article and we were told that good examples of charcoal platforms survive in Charlton Forest. The LiDAR imaging looks promising but will have to be verified on the ground. The search will therefore continue!

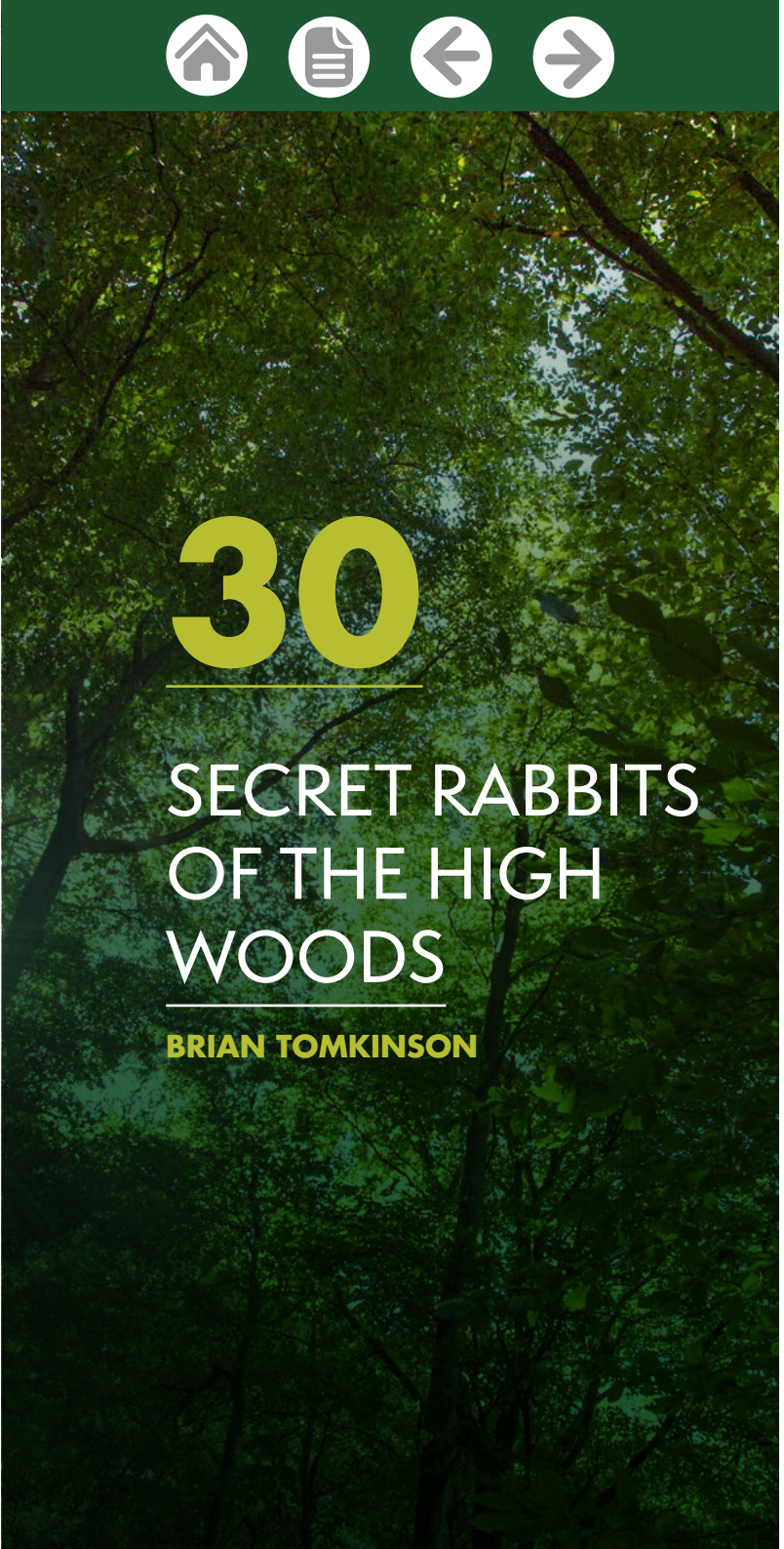
> Different uses of the fire will dictate how your fire is going to be. If you're going to use your fire for metalworking, for example, you wouldn't even use wood. You can get a much hotter fire if you use charcoal, but charcoal is a derivative of wood. You make it from wood and people would have known how to do that a very long time ago. We find evidence of that.
>
> Maureen Page

Numerous charcoal platforms were eventually found in the High Weald, but they were notoriously difficult to diagnose from LiDAR images alone and not easy to recognise on the ground. Dateable evidence is also scarce. However, they were usually located near water, typically small streams, and in the High Woods area there is a lack of such water. In the High Weald there is a widespread legacy from the Wealden iron industry and its associated woodland features, which is not true of the High Woods. Does this account for the apparent absence of charcoal platforms within the High Woods area? Possibly! But charcoal was made for purposes other than smelting iron: for example, for domestic fuel. Is the absence of charcoal platforms then purely down to topography and lack of water? Or maybe the High Woods had no wood suitable for making charcoal? Does this imply a lack of deciduous woodland after disemparkment?

It is possible that the archaeological evidence for charcoal platforms is there in the High Woods, but still elusive, even for LiDAR! An image published in the *Sussex Archaeological Collections* gives tantalising evidence that charcoal burners were alive and well around the Arundel area in the mid–late 19th century. This illustration gives a fascinating insight into the lives of those itinerant workers, complete with their 'bothies', with babies, hens and tame cats living secretly and hidden in the woods. This late production of charcoal would coincide with the period of 19th-century reafforestation (see below).

Bills of sale for the Cowdray Estate in 1854, 1859 and 1860 record 'Sales of Underwood' from numerous coppices. A sales ledger dated 1843–1870 records the sale of loads of chestnut, oak, ash, elm and Scotch fir, the larger loads being of oak, elm and ash. So in the mid-19th century we do see mixed woodland, at least on the Cowdray Estate. This might neatly fit in with the use of saw-pits we found on the ground. The time frames are similar and coppiced wood and plantation thinnings would have been suitable for the charcoal burners of Arundel. However, further research would need to be carried out to prove such a correlation.

Whilst it is acknowledged that archaeology has a good rate of preservation within woodlands, it also varies with the locations of those woodlands. Some archaeological absences, such as pillow mounds and charcoal platforms in the High Woods area, are puzzling. This project has, however, provided a significant insight into past landscapes, some of which were very different from those we see today. Volunteers of the Secrets of the High Woods project had to stretch their imaginations continually in order to visualise and recognise those elements of a past landscape unfamiliar to them. They have learnt that imagination is a prerequisite of being an archaeologist, and that the work of an archaeologist is never done. More data lead to more discoveries. And more discoveries lead to more questions. And more questions require more data to answer them. It was ever thus.



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SECRET RABBITS OF THE HIGH WOODS

BRIAN TOMKINSON

DURING THE SECRETS OF THE HIGH WOODS FIELD SURVEY PROGRAMME three features detected by LiDAR were identified by volunteers as 'pillow mounds' when ground-truthing in the Stansted area. Alice, the project archaeologist, told us that pillow mounds are low narrow mounds of varying length surrounded by a ditch, and are associated with rabbit farming. Rabbits were an important source of meat in the past, and also supplied fur for small articles of clothing. I suppose the mounds are called 'pillow mounds' because they look a little bit like gigantic pillows, lying in wait for any tired giant who might be passing! Researching more thoroughly, I found that in the past these sites were mistakenly attributed to prehistoric rituals or other activities. The eminent archaeologist Augustus Pitt Rivers (1879) was the first to link them to rabbit-farming activities. By now I was in too deep – that's the addiction of research – I was completely hooked: I just had to find out more about these 'pillows'!

Rabbits were originally a western Mediterranean species introduced into Britain from mainland Europe. There was possibly a small introduction of the species in Roman times, but these probably died out. Reintroduced by the Normans, their first documentary record was in 1135, when Drake Island in Plymouth Sound was granted to Plympton Priory *cum cuniculi* ('with rabbits').

Rabbits are social animals, living in large hierarchical groups underground. They were probably fairly delicate when first introduced, but may have become more accustomed to British conditions through natural selection. Some of the earliest rabbit warrens were established on offshore islands, where the rabbits could be kept relatively safe from predators, one notable local example being Hayling Island (residents there will recognise the name Sinah Warren). Rabbits dislike damp conditions, the young being particularly susceptible to drowning, and they prefer light, well-drained soils. Warreners tried to replicate these conditions within warrens by building banks surrounded by ditches to improve drainage and to facilitate burrowing (it's easier for the rabbit to get rid of the spoil on a slope, for obvious reasons). Most known pillow mounds tended to be in more marginal agricultural areas such as Dartmoor, Wales and the East Anglian Breckland. One of the better-known researchers of pillow mounds, Tom Williamson, recorded over 2000 surviving pillow mounds in England and Wales and mapped their distribution. It can be seen that they lie mainly in more marginal agricultural areas, with few examples in Sussex or Hampshire. It is presumed that warrens in more fertile areas might have been ploughed flat following farm mechanisation. Early medieval techniques of clearing the burrows with ferrets and trapping the escaping rabbits in nets have even survived to this day, as Joe Grundy from *The Archers* will tell you!

Rabbit warrens were originally associated with local estates, often being part of a deer park. Frequently, a pond would be dug to keep fish and the spoil used to make a rabbit

A pillow mound (former rabbit warren) at Batty's Park, in Stansted Park. The mound can be detected in the rising ground to the left of the image.

warren, all secured within the park pale or enclosure. The warren was often, together with the deer park, considered something of a status symbol. In the medieval period the black and silver varieties of rabbit were particularly valued for their fur, but eventually rabbit pelts became the raw material for cheap items of clothing, particularly hats. Even up to the 18th century the small-scale husbandry of rabbits continued, as rabbits were still considered an expensive luxury item. This gradually changed as they became more common and eventually they became food for the wider population.

In due course rabbit farming developed into a major food industry and, with the use of winter fodder, the requirements of a growing urban population could be satisfied.

So what would our own local fieldwork reveal in the High Woods? The field survey team found three possible pillow mounds in the relatively small area of Stansted Park. I thought that there could be more hidden by woodland in the survey area, particularly as historically there were many local deer parks. So I searched for place-names containing the words 'warren' or 'rabbit' in that part of the survey area covered by OS Landranger Sheet 120. I then checked out the LiDAR mapping nearby and identified twelve possible pillow mounds. Their length and breadth were measured from the LiDAR images. Apart from the Stansted locations, nine places with 'warren' or 'rabbit' in the name were found. An additional one at Ditcham Park was identified by NMP staff of Historic England.

> People had told me, people who had worked there during the War, and in the farms surrounding Kingley Vale; Fred Longman, the bailiff at Langford Farm, was the man, and he told me that he was up there one time in the summer and he said the rabbits were so hungry, and this was in the 1940s, that when they left their warren on the top of the hill they had 200 yards to go to the nearest grass and herbage; and he said on a quiet night when there was nobody about, you could stand there and you would hear this rumbling as a great army of rabbits came out of their warren and came towards you – and if you stood still they would just stream either side of you and onto their nearest grassland … .
>
> Richard Williamson

The dimensions of the candidate mounds all fell within the range typical of pillow mounds found elsewhere and had ditches associated with them, suggesting that they could have been components of rabbit warrens. But,

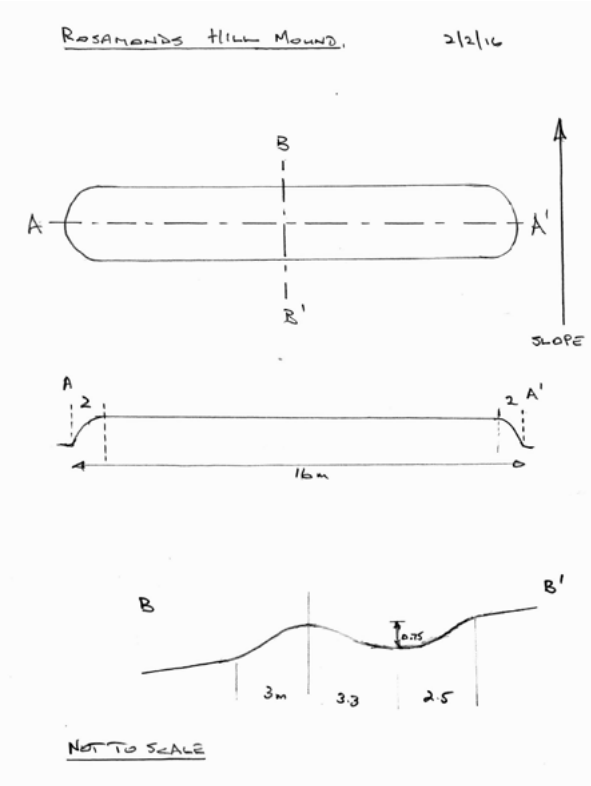
A wild rabbit, a distant descendant of all those rabbits bred on the pillow mounds of the High Woods.

on visiting some sites to check them out, I was painfully confronted with the realities of archaeological ground-truthing. One candidate turned out to be a pile of logs from forestry work; one a not very rabbit-friendly heap of flints (they have soft paws you know!); and another a smelly heap of manure!

Interestingly, one of the Stansted locations was named 'Hare Warren'. In contrast to rabbits, hares are not gregarious and spend their lives above ground. On the ground this site was defined by banks which enclosed a large triangular area. It is possible, therefore, that the area may have been deliberately set out in this shape to provide corners with acute angles, allowing the hares to be trapped or cornered more readily when being coursed.

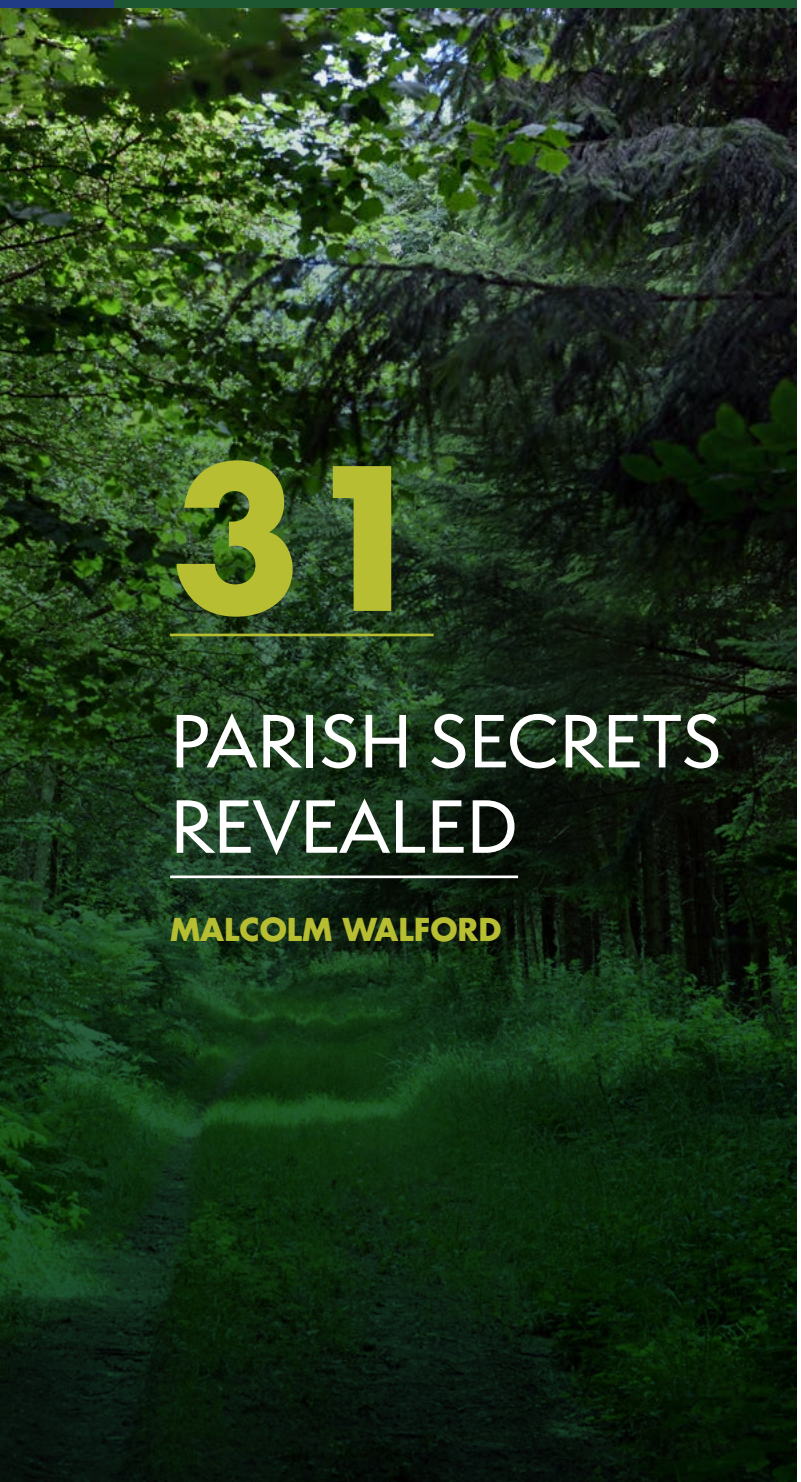
The case of 'Warren Down' was a classic example of the importance of local knowledge. I suspected that a mound seen in one garden, long and narrow with the hint of ditches each side, was a pillow mound – the clue was also in the name! Additionally, there were some very obscure oval features in the adjacent field, similar in shape to known warren earthworks on Dartmoor. This led me to think that the long mound was a 'clapper mound' (used to separate breeding does), and that those in the field were the ploughed-out remains of the main warren. Imagine my disappointment when the garden's owner told me that 'oh yes, that was a line of old yew stumps that I buried to tidy the garden'. Perhaps taken aback by my disappointment, he did add 'there were rabbits in the field'. I departed a little bit happier!

Although additional field and archive work is required, this brief survey has revealed a disproportionately high number of pillow mounds in a small area, thus confirming that rabbit husbandry was more prevalent on the South Downs than the distribution of previously



An example of a volunteer's sketch plan done in the field. This depicts a pillow mound (former rabbit warren) at Rosamond's Hill, Stansted Park, West Sussex.

known pillow mounds would suggest. In addition, it demonstrates once again the power and value of the Secrets of the High Woods LiDAR survey followed up by ground-truthing and archival research. And on a personal note – I'm still hooked!



31

PARISH SECRETS REVEALED

MALCOLM WALFORD

I THOUGHT I KNEW EVERYTHING THERE WAS TO KNOW ABOUT THE PARISHES OF WEST DEAN AND SINGLETON, which lie in the L-shaped Lavant valley, overlooked by chalk hills. I had driven through them, walked their footpaths and attended their visitor attractions. It was a shock to me when I realised how little I actually knew about them. I am grateful to the Secrets of the High Woods project for helping me discover some deeper layers of parish histories.

My researches began with a visit to the West Sussex Record Office. With assistance from its archivists I discovered informative documents and maps that helped me find out more about these parishes. I was also able to call on the help of the archaeologists at the South Downs Centre in Midhurst, where I was able to get hold of the spectacular LiDAR mapping for my research area.

One theme became quickly apparent: nothing much stays the same in terms of our local landscapes. Human beings and nature are forever intertwined, altering the topography in different ways and at different times. Much is hidden and the more information I dug up the more I found out just what an interesting history existed below the surface in neighbouring woodlands and fields. I will relate only three personal discoveries that surprised me.

First, in the late medieval period West Dean was the location of a massive rabbit warren. Rabbits were introduced into our country by the Normans to provide both meat and fur. Adults were known as coneys, the young as rabbits, and they were held in warrens looked after by a warrener. Now this warren was of truly massive proportions. It covered 364 hectares, had a circumference of around fourteen kilometres and was stocked with between two and eight males to the acre (0.4 hectare), with one male for every four females. It stretched from the sides of Bow Hill across the Lavant to South Harting road and almost as far as West Dean village.

> When you look at the old Edwardian photographs of Kingley Vale … of that gully, a lot of it is chalk, just bare chalk and it shows you what a vast number of rabbits there were there and all over the downs – huge, huge warrens. I mean there were tens of thousands probably in Kingley Vale, despite the fact that in the War it had been a military training area.
>
> Richard Williamson

The warren was also used by commoners to graze their sheep, their numbers being strictly controlled by custom. By the end of the 18th century there was increasing tension between the commoners, who were allowed to keep over 1800 sheep in total, and the warrener, whose rabbit population had increased to between 3000 and 5000. The warren had simply become overstocked and the grazing was getting worse. In 1804 the then duke of Norfolk decided to close down the warren. The ground was to be enclosed

and ploughed, which doubled its value. Three farms now occupy the area once used to produce rabbits – Brick Kiln Farm, close to the Lavant–Harting road, Little Home Farm, just outside the warren and close to West Dean village, and Lodge Hill farmhouse, on the site of Warren House. These were all constructed at the beginning of the 19th century. Their appearance signalled an end to a way of life that had existed for centuries – and changed the landscape dramatically.

> Man has interfered with woodland in this country for ten thousand years and first woods started to be cleared in Neolithic times, but the dramatic increase in that woodland loss has occurred really since 1940 … . That understanding about that habitat, where only 2.6 per cent of England is ancient woodland, 40 per cent of that is in south-east England, so we're spoilt for ancient woodland.
>
> Hugh Milner

The next parish secret to be revealed was the existence of water meadows alongside the river Lavant. In 1813 these highly productive meadows had been praised by the Rev. Arthur Young in his survey of Sussex agriculture. The practice was to flood these meadows in December for three weeks, which not only killed moss but added silt and calcium and allowed young grasses to flourish. These provided early grazing before the hay crop was ready. In the spring, until the end of May, the meadows were again flooded for twenty-four hours at a time by highly skilled 'drowners'. A LiDAR image of the Lavant between Singleton and Charlton clearly shows post-medieval water carriers (or channels) and panes (earthen ridges). The very wet winter of 2015/16 revealed these when viewed from Levin Down.

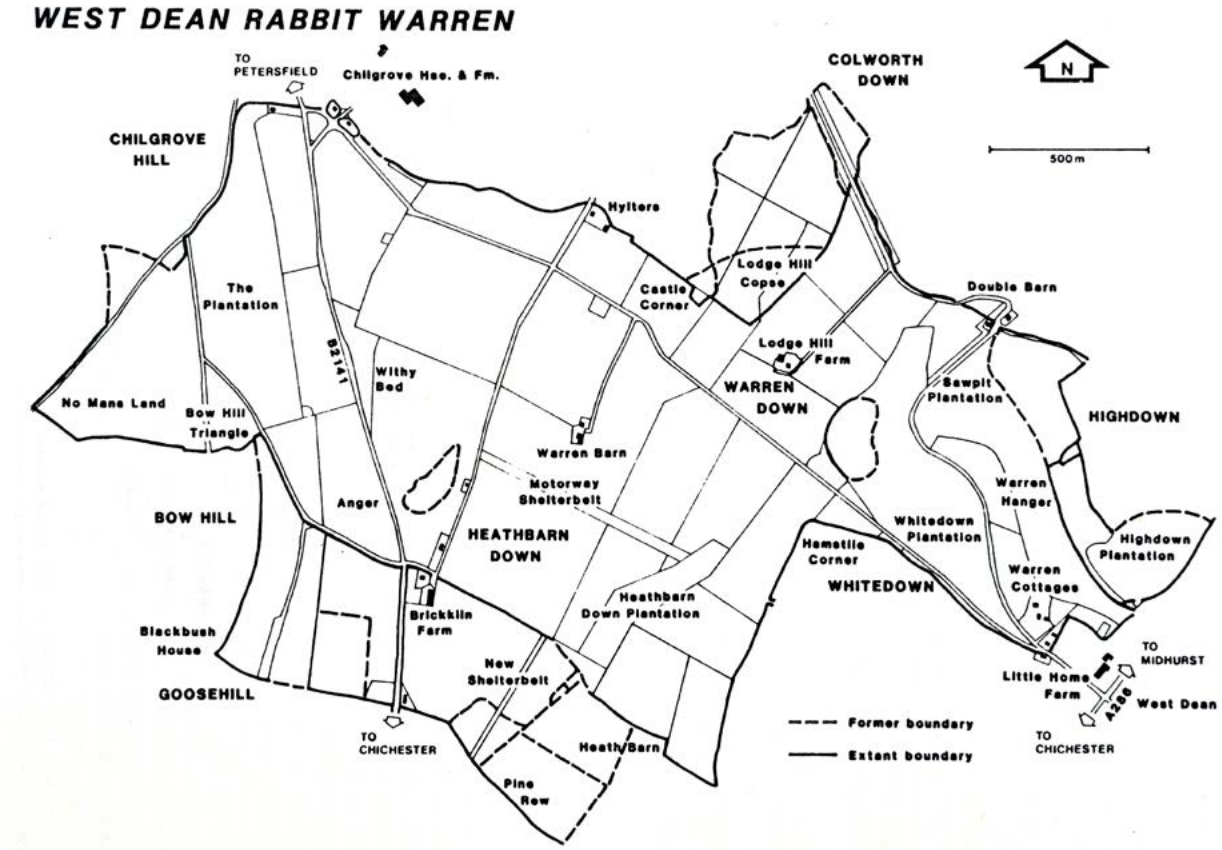
At one time the low-lying land fronting today's West Dean mansion was also flooded and the LiDAR images of meadows next to Preston Farm at Binderton show similar features. It is not known at present when these

This LiDAR image of the area between Singleton and Lavant clearly shows, in the middle of the image, faint lines of ditches and banks – the remains of the system of water meadows.

Through hazy sunshine a view of the water meadows near Singleton. The channels and patterns of the water reveal something of the underlying design of the overall system.

irrigated water meadows were created, but there was a great boom in their construction between 1640 and 1750. I have been unable to find out when the use of these 'floated meadows' ceased. The Binderton tithe map certainly shows a complex of water carriers. It is generally thought, however, that the increasing use of alternative animal fodder hastened their decline by the middle of the 19th century. (A word of advice. If you visit this area in the summer you will not even see the river Lavant; being a winterborne, it dries up for about six months of the year.)

Finally, I would like to share something I discovered about the High Woods themselves. The hillsides of these parishes were not always wooded and certainly not as much as they are today. LiDAR images of the southern slopes

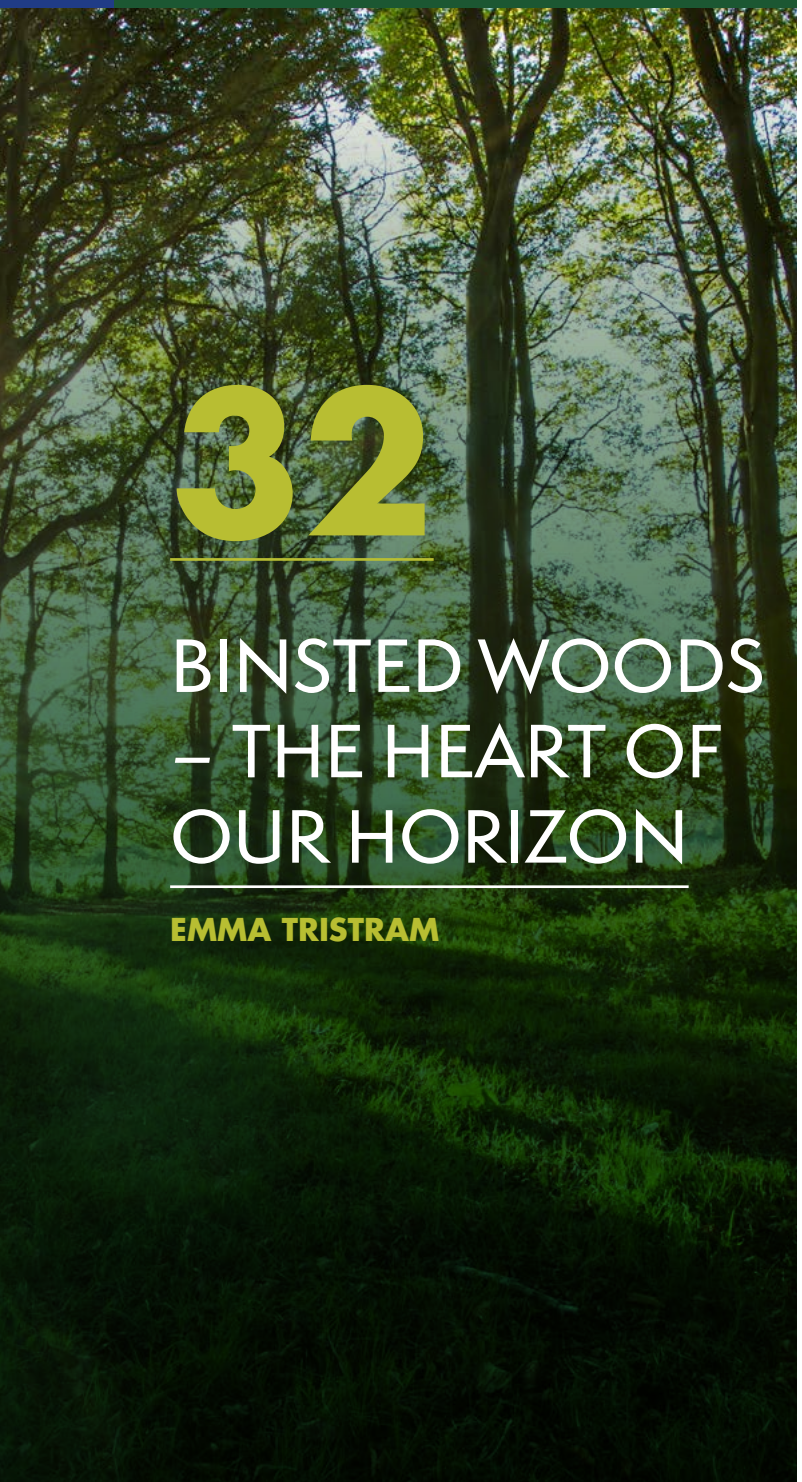


A map of the very extensive rabbit warren at West Dean. The warren was 364 hectares in size, and its boundary ran to 14 kilometres.

of the tree-covered downland around West Dean woods, for example, show ancient field systems, tumuli (or barrows), a park pale ditch and pits. All of these imply a much more open landscape.

Since medieval times, when woodland cover in this area was only about 6 per cent, there has been a steady increase in tree planting, so that, according to a study done in the 1980s, the West Dean Estate had reached about 30 per cent woodland cover. There is very little truly ancient (pre-1600) deciduous woodland in the area, although the Kingley Vale yew wood, part of which lies within the parish of West Dean, is very old. Beech and larch were planted in considerable numbers after the rabbit warren was destroyed, and other areas in the parishes were similarly planted in the mid-19th century. A report written in the mid-1930s stated that 'during the past 30 years, between 600 and 700 acres have been planted on this estate'.

Nature and humankind often have a changing relationship, however. You can observe that in the three examples I have described. And sometimes that relationship is catastrophic. Witness the 1987 great storm which felled 50 per cent of woodland and damaged 25 per cent more on the West Dean Estate. Over 1000 acres had to be replanted with trees to provide commercial income over the next forty years. The High Woods were changing yet again.



32

BINSTED WOODS – THE HEART OF OUR HORIZON

EMMA TRISTRAM

BINSTED WOODS, 250 ACRES OF SEMI-NATURAL ANCIENT WOODLAND SOUTH OF THE A27 WEST OF ARUNDEL, form a neglected and undervalued area of the Secrets of the High Woods Project. They are on the edge of the LiDAR area, on the lower slopes of the downs, just inside the border of the South Downs National Park: isolated, beautiful and at risk. Interlocked with fields and village, haunt of Purple Emperor butterflies, much loved today for walking, riding and bicycling, they have been threatened by many invaders in the past – Romans, Saxons, Vikings, Normans have all come this way. Indeed, the LiDAR project has shown that the Romans laid one of their famous roads right through what is now Binsted Woods, its unflinching straightness disrupting prehistoric fields and livelihoods that had sustained themselves for centuries, millennia perhaps. Now comes another threat to Binsted Woods and their historic landscape, in the form of the many Arundel bypass schemes, planned over the years since 1987. It is ironic that we ourselves seek to damage what no other invader has managed to destroy.

HOW HAVE BINSTED WOODS SURVIVED?

The whole of the old Binsted parish, not just its woodland, was once part of the medieval Arundel Forest. This was used in part by the earl of Arundel but also by a number of other lords, including the archbishop of Canterbury. Being in the forest probably helped Binsted Woods avoid being cleared for agriculture.

A forest was an area of land on which noblemen's deer were kept, which had its own rules, courts and officers. Hundred House Copse, within Binsted Woods, heading the steep valley of the Binsted Rife, was where the medieval forest court (known as an 'Aves court') met. The hundred court also met there (hence the name), administering a district of Saxon origin which stretched down to the sea.

The pottery industry also helped the survival of the woodland. Two medieval tile and pottery kilns have been excavated in Binsted; one is at Hedgers Hill, the other in a field opposite the Black Horse pub. The presence of trees nearby provided fuel for these industries. The potters made sure that they took timber from the woods in a sustainable way – their occupations depended on continuing sources of timber as much as clay.

ARE THEY ANCIENT WOODLAND?

Binsted Woods are almost all 'ancient woodland' (i.e. the area has been wooded since about 1600 or before). This does not mean they look now as they looked in prehistoric times. Probably all woods that were later enclosed and coppiced (the kind of woods we are used to seeing) were originally wood pasture, with grazing animals in clearings and more spread-out trees.

Several areas in Binsted Woods were shown as fields on Yeakell and Gardner's maps of 1778–83. This means that those areas are not classed as 'ancient woodland', although they share many of the features of the

woodland around them. All woodland is at risk, but these areas are most in danger.

THE ARUNDEL BYPASS SAGA

In the bypass story the woods have first lost, then won, now seem likely to lose again. In 1987 a bypass route through all the best parts of Binsted Woods (the sunny, quiet, south-western edge) was chosen as the 'Preferred Route'. In 1993 the woods, and Binsted, were saved by the choice of another route (never built), across Tortington Common. The 2014–16 plans include a route through Binsted village itself, just outside the National Park boundary, separating most of Binsted from its woods and dividing the woods in two.

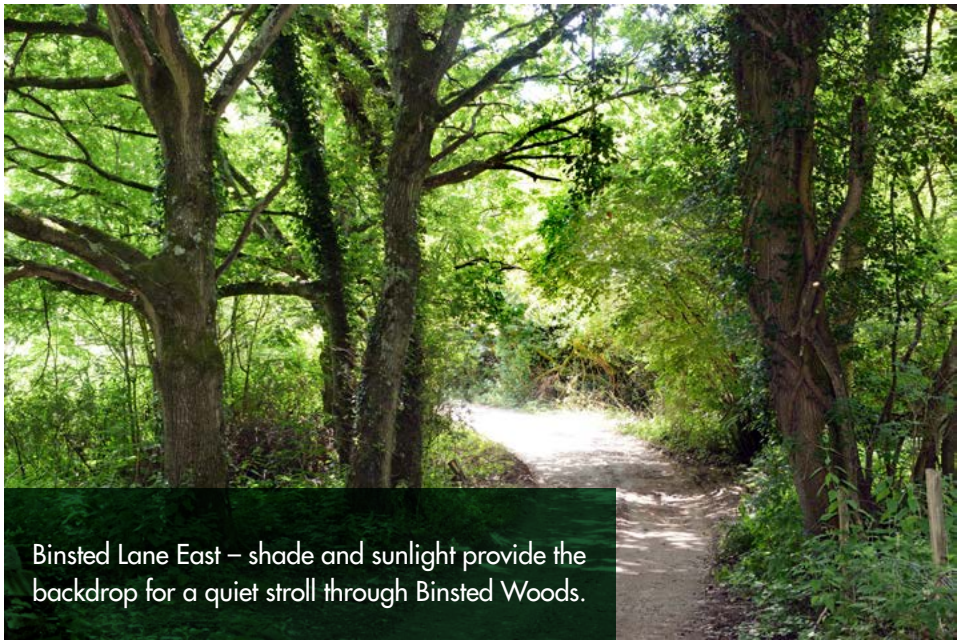
BINSTED WOODS IN ART AND LITERATURE

On Sunday 18 August 1940, a day of continual aerial bombardment on the south coast of Sussex, the poet Laurie Lee roamed the whole of Binsted Woods with his lover Lorna Wishart. His diary describes at length their hiding in the woods while bombs fell and the aerodrome at Ford catching fire. His poem, 'Song in August 1940', records this momentous day combining love and war: 'Your lips are turreted with guns, /And bullets crack across your kiss, /And death slides down upon a string /To rape the heart of our horizon.'

The little-known artist W. S. Rogers often drew Binsted and Binsted Woods in the 1930s and 1940s. Binsted Park, within Binsted Woods, was transformed into a 'pocket park', in imitation of grander ones higher on the downs, by the owners of Binsted House in about 1800. Bill Pethers (born 1940, descended from the family who lived in the old Binsted House) says that Binsted Park was first ploughed in 1943, having been pasture land before that. Bill added that 'I was told that I ran away around the big field of corn with only a hat on, which was all my mother could see of me!'

The writer and artist Michael Wishart (Lorna's son), in his memoir *High Diver*, describes the walk into Binsted Park shortly before the Armistice in 1945: 'a muddy path, through fields, across a bridge in a small,

Excavation of a medieval tile kiln in Binsted Woods in 2005. The superstructure of the kiln has long since disappeared but the presence of layers of tiles shows the main output of the kiln.



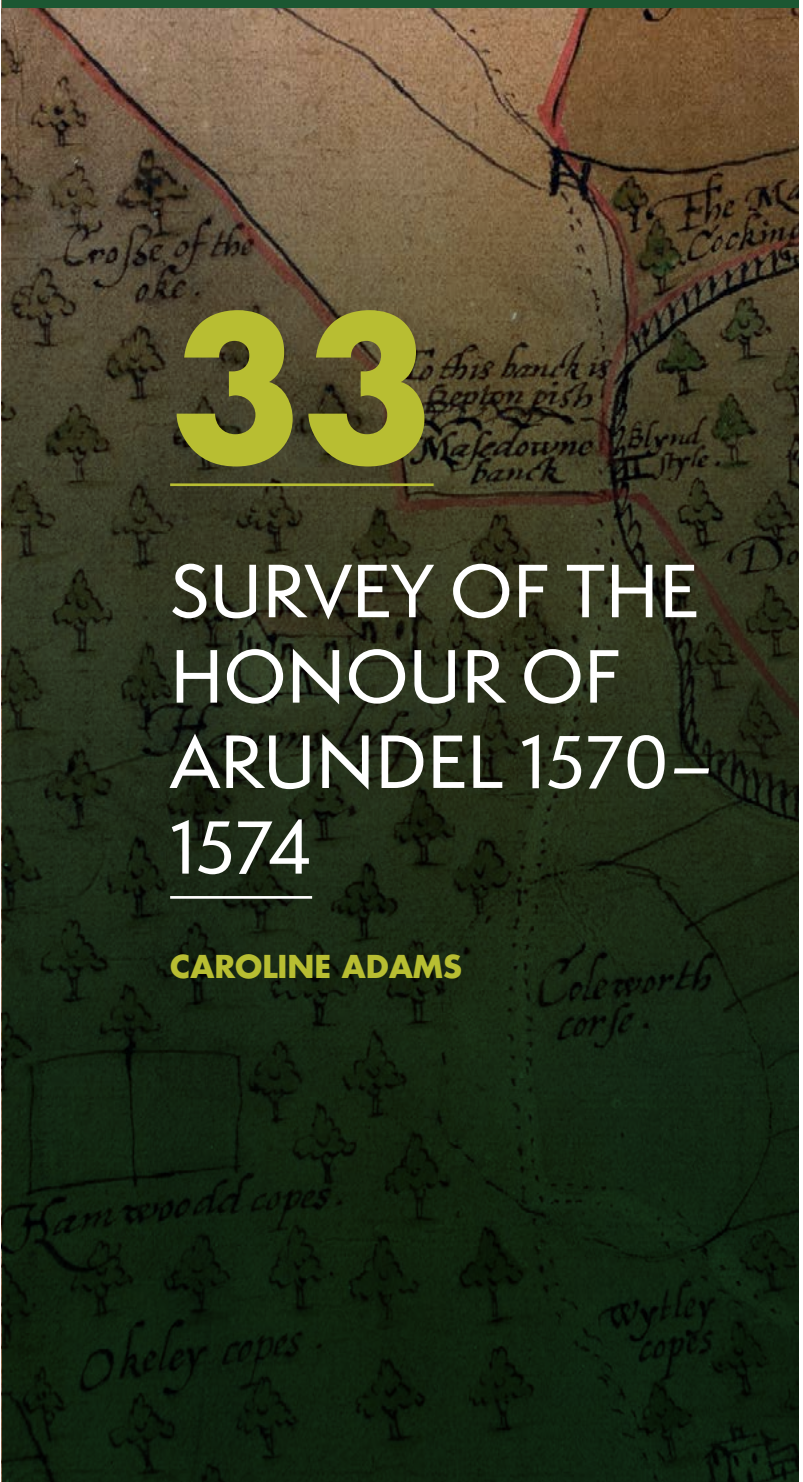
Binsted Lane East – shade and sunlight provide the backdrop for a quiet stroll through Binsted Woods.

A view of Binsted Park, illustrating the mix of woodland and open spaces that provide walkers in the park with a variety of alternating views over land and sky.

The 12th-century church of St Mary, at Binsted. Medieval wall paintings survive within.

sunken copse, into what was then parkland: a grand, broad, upward slope of green, dotted with ancient trees. Binsted Park epitomised the vanishing England of my youth.'

The Romans, and their celebrated roads, have come and long gone. But Binsted Woods, 'the heart of our horizon', have not vanished yet.



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SURVEY OF THE HONOUR OF ARUNDEL 1570–1574

CAROLINE ADAMS

A SURVEY OF THE HONOUR (OR ESTATES) OF ARUNDEL was carried out for the duke of Norfolk in 1570–74, and is now held at Arundel Castle Archives. The contents of the survey include Arundel borough itself and another twenty-seven manors west and south of the castle. These include the area around Arundel; Halnaker, Boxgrove, Goodwood, Selhurst and East Dean Parks; and also the manors of Stoughton, Charlton, Singleton and West Dean, Bury and Bignor. Coincidentally, the survey covers the approximate area of the Secrets of the High Woods project, and the deer parks especially are described in depth. Consequently it has been used by several volunteers on the project to draw out the history of their topic, confirm landscape features or research land management.

The reason for the survey being drawn up was to clarify the position of the estates after a period of upheaval for the family. The survey was started in September 1570, when Thomas, 4th duke of Norfolk, was in the Tower of London and then under house arrest – the duke was taking the opportunity to sort out the future of his estates. However, he was executed on 2 June 1572. After an interval the survey was picked up again for the earl of Arundel.

The survey is very detailed; every tenant is named, and they include nobles and wealthy gentlemen, such as the Bishops, the Palmers, Viscount Montague, and the Dean and Chapter of Chichester Cathedral. Types of leases are given, with detailed comments on responsibilities; for example, the farmer of Preston:

> promiseth to repayre all the said howses, and shall not demyse the promisses [? (hole)] without Lycence, and shall fynde one hable man on Horsebacke when he shalbe therunto called, And shall gyve to the Lord's officer sufficient meat Lordging and horsemeate for them theire men and horses, onc everie yere and at one tyme for 2 dayes and 2 nightes.

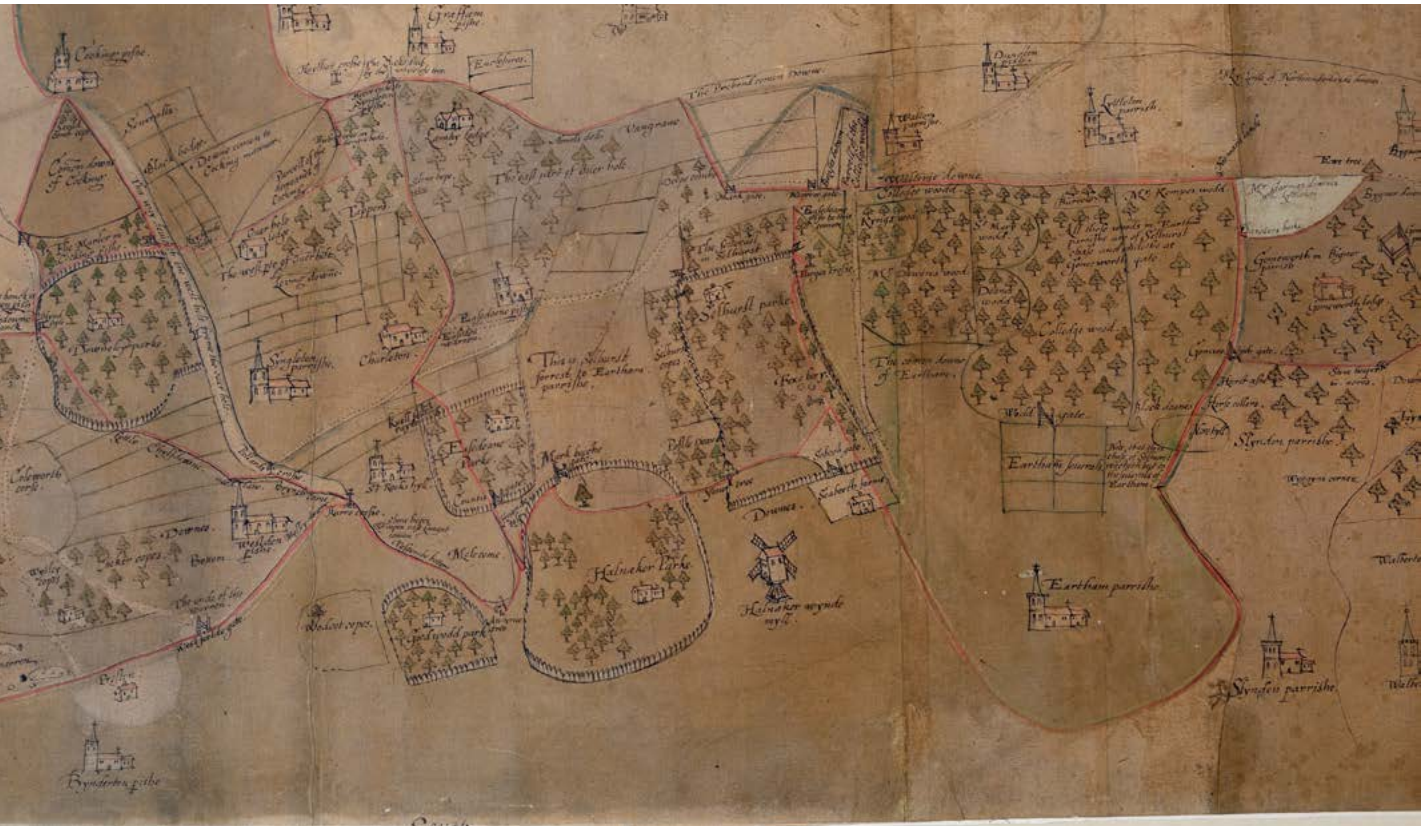
These arrangements were for the holding of the manor court, when finances were audited, tenancies updated, disputes settled and income assessed.

The parkland is assessed, and keepers are named, with details of their tenure:

> Md the Soyle of the said parke is a swete and shorte feed, best for deare & shepe and the keiper thereof at this present is named Henry Ferrour sarvaunte unto my Lord of Arundell who hath no interest but at will and lxs xd yerely for his Fee, with a loidge nere the said mannour house of Halnaker mete for a keiper.

Thomas Palmer, keeper of Goodwood Park, was well provided for:

> ... ther is buiylded within the said Park a faire mansion house and a



A section of the map of the Arundel estates c.1590, from Arundel Castle Archives. Note the surviving number of enclosed parks depicted on the map.

fayre garden and one fayre orteyard, adioyninge upon both well paled with sawen pale and diverse necessarie oute howsses. All which howses the said Sir Thomas Palmer, by his covenante is bounde to repayre and mainteyne duringe the said term (great tymbre only exceptid) which shalbe assigned unto him oute of the mannour of Cocking

Md there is one well that sufficeth for water to the said houses

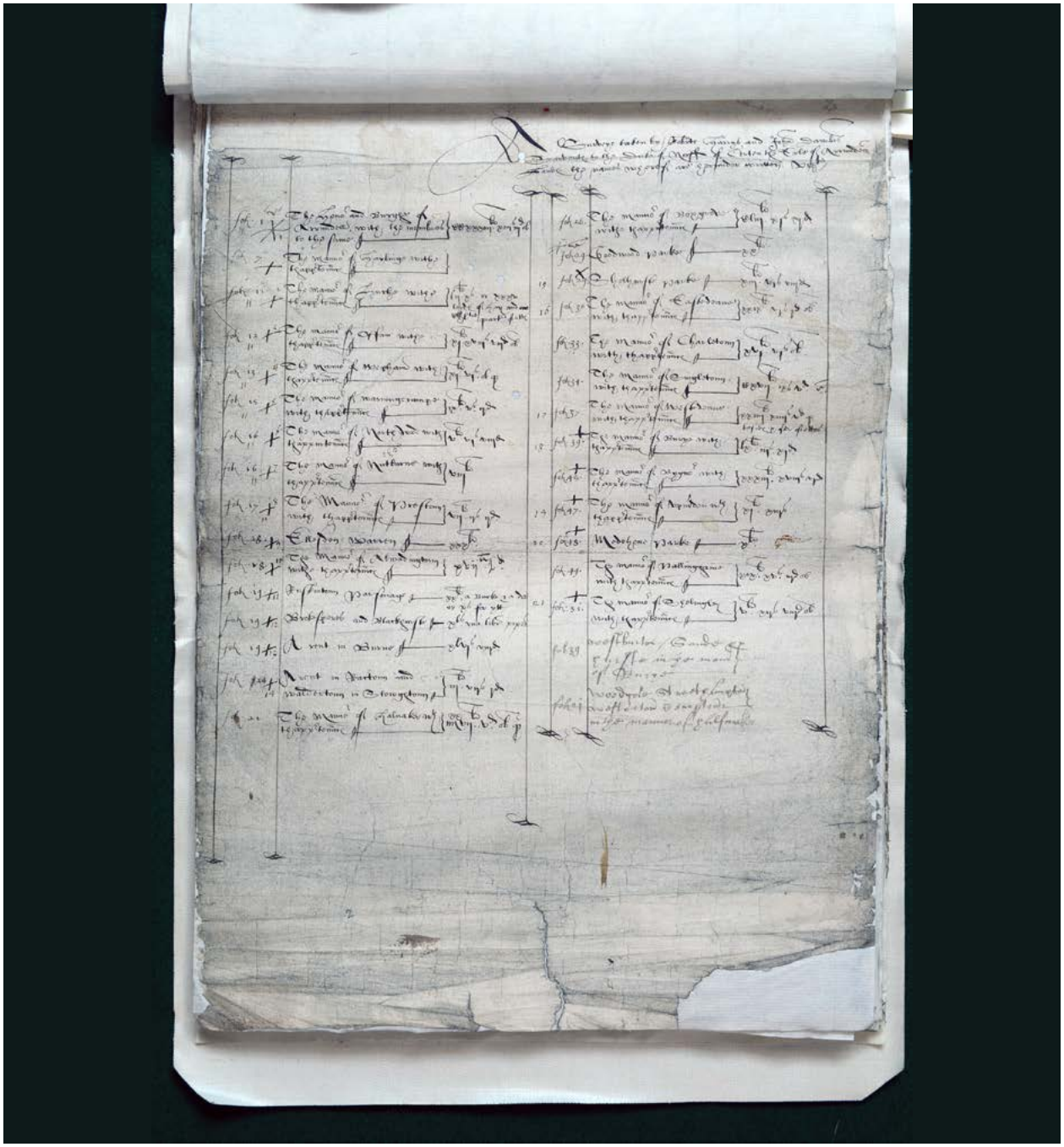
... by covenants in his Leas maye fell all other woodes and underwoodes within the said parke and to fell cuttdowne and carre awaye the same, and to Loppe and Shreede all mannour of Trees growinge within XXtie fote within the said pale betwene the Last of october and the Last of January.

But he had responsibilities:

Provyded allwayes, That if the Fermour for the tyme beinge do not performe & keipe or shall at any tyme breake the covenante or shall doo or comytte any acte or actes whereby he shall happen after to be lawfully attaynted by verdite, outlarie or confession of either treasonn, murder or felony, or any other offence etc whereby he or they shall deserve losse or forfaiture of landes etc That then the terme of yeres aforesaid to ceasse.

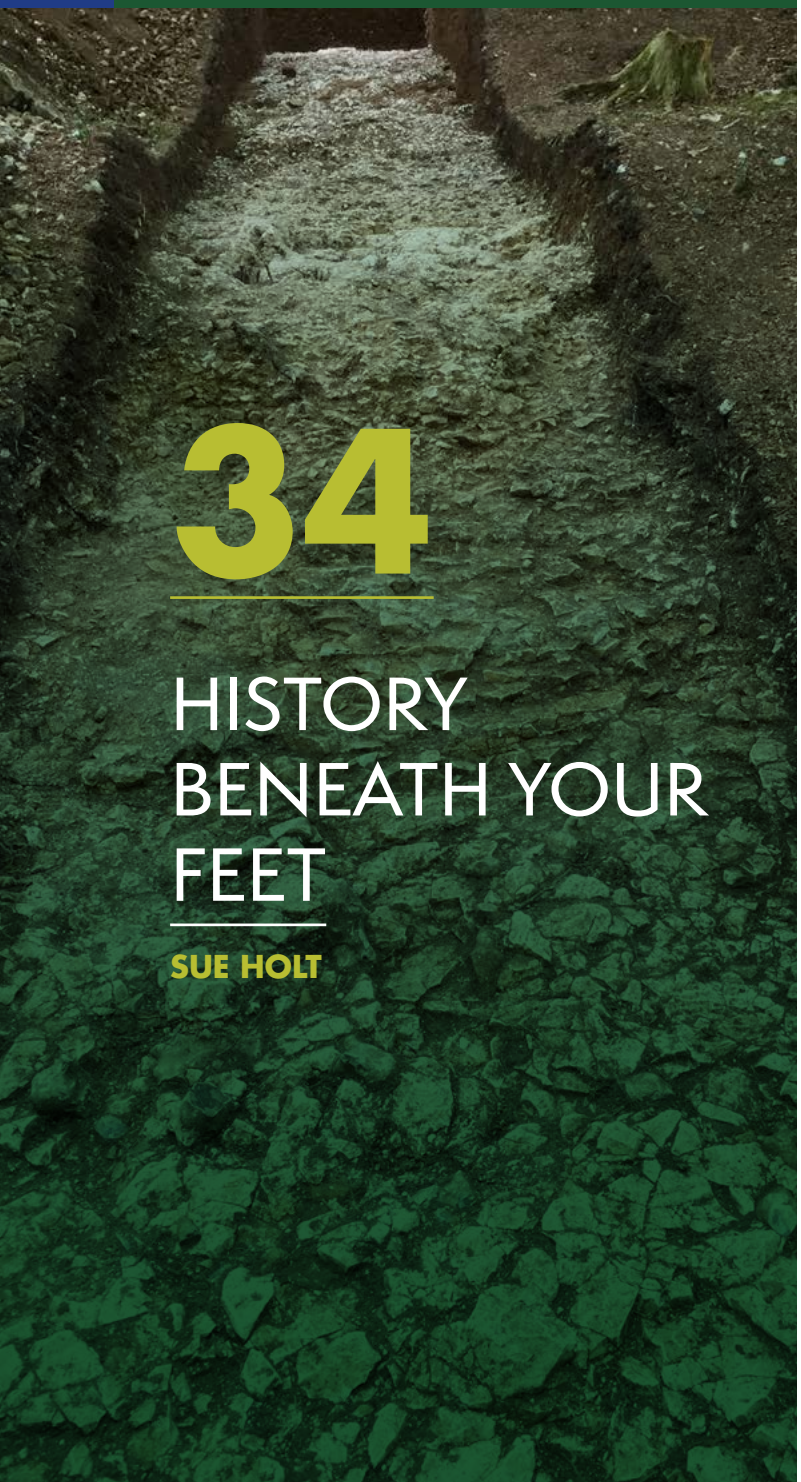
There are comments on the state of repair of buildings, such as the deer park pales and farm buildings, and the boundaries of the parks are described.

Also in the castle archives is a map that dates to about 1590 and which covers the area of the survey – again, almost coterminous with the limits of the project. It confirms some of the descriptions of the property, particularly the parks, although the two were not drawn up together, and probably not created for the same purpose. But, used together, they give



much important information on the state of ownership and land use of the area. These surveys are very important because they give us the last picture of a landscape losing its medieval deer parks at a time when a huge amount of property transactions were being carried out after the dissolution of the monasteries.

A 1570-74 survey of the Earl of Arundel's estates. This is – effectively – the index on the first page. The first sentence reads: *'A Surveye taken by Robarte Harrys, and John Dawbis sarvantes to the Duke of Norfolk of Certen the Erle of Arrundell Landes the names whereof are hereunder written vizt'*. The document is known as the Survey of the Honour of Arundel.



34

HISTORY BENEATH YOUR FEET

SUE HOLT

THE HOOK WAS THE NAME OF THIS PROJECT. How could I resist its suggested undertones of wild romance: the Brontës and R. D. Blackmore, or even the childish adventures of the Famous Five? This was the world of my bookshelf companions, the naturalists and wordsmiths, Oliver Rackham, Richard Jefferies, Robert Macfarlane and Edward Thomas.

I have lived under the lee and the lure of the South Downs almost all my life. My descendants came from the far west of the downs, the Meon valley – and were probably Jutish, I was to learn from this project. When I married, we settled our own family on the coastal plain, with the sea in front of us and the gently brooding hills at our backs. They were always there.

Having an academic background, not as an historian but in languages and literature, I thought I would manage archive research; I loved the countryside, history, stories, the layers of time held in one place, this was made for me. I wanted to know more. The project did not disappoint. We were given inspiring and informative talks, workshops and visits to relevant sites, regular meetings and plenty of support. Hours, days, passed in the West Sussex Record Office. We were unaware of the sunny days outside, ignoring until too late the aching neck and raging thirst. Our research aim was to contextualise, to back up, the findings of the field surveys; to try to fill in the gaps over the past 4000 years with factual, documentary research.

Being out in the landscape was the touchstone and in this I was lucky. Uppark and its surrounding lands and woods falls into the north-west of the LiDAR area and I had chosen to research it because I worked there and had a passion for the place and its landscape. They say 'history is a matter of geography', that the lie of the land, the soil, the weather, affect the outcomes of battle, successful settlements, population growth and distribution of wealth. Yet we have always transformed the land to our own ends too.

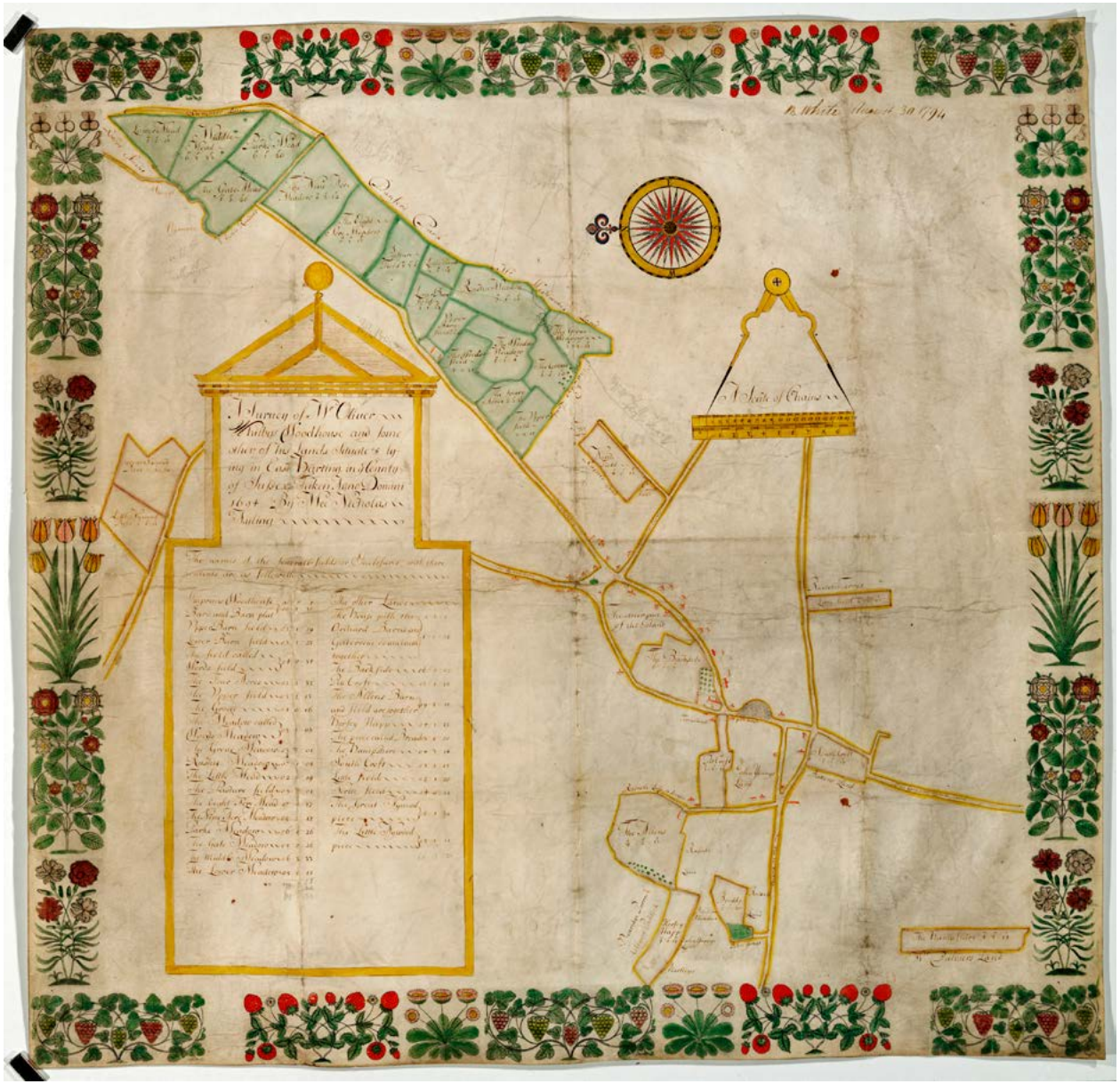
The Uppark Estate is nowhere near as heavily wooded as in the 17th century, when a travel writer of the times, Celia Fiennes, coming upon Uppark House, commented: '… a very fine Parke [with] stately woods and shady tall trees'. Take a look at the two Pieter Tillmans landscapes, *c.*1734, in Uppark's hallway to see a different landscape then, even allowing for artistic licence. The woodlands were vitally important to the economy and downland life of Uppark and the community around. Sir Harry Featherstonhaugh's Personal Accounts (1774–82) in the Uppark Catalogue archives give details of income based largely around timber sales. From West Harting Down, south to Hale Wood (Piece) and Star Copse, to the demolished Ladyholt Estate and across to the older Pads Wood in the bottoms of Uppark, woodlands have come and gone according to the needs of local settlements.

The site of Uppark was once known as Harting Park. There are foundations from at least the 15th century beneath the present house, and references to a 'dwelling' long before Uppark was built (*c.*1690). The area

was likely to have been a medieval deer park, under the domain of Arundel; deer and other animals were contained and hunted for vital food, not just sport. It was a landscape managed in order to create a nature's larder for Harting. All of this is well documented – just read *The History of Harting*, by Rev. H. D. Gorden, as a starter. However, our researches in the record office meant verifying sources and searching for other links too, hidden in acres of closely scribed, fading inventories and deeds.

> It is that sense of place and that connection with the landscape. You know, people have connections with landscapes, be it the Lake District, the Peak District or the Cornish coast, and for me it's the South Downs.
> Nigel James

But what of even earlier settlements on the land in that great undocumented prehistoric period? I soon realised I could not delve into archaeological research; as much as it fascinated me, I did not have the time or expertise. The beguiling danger of the record office lies in all those tantalising tangents. It needs discipline to let go of what you do not need. When my excitement and anticipation about the research crumpled into frustrated despair – well, that was the turning point. I had to be more focused. The most remarkable discoveries for me were the maps in the WSRO archives. Oliver Whitby's beautiful



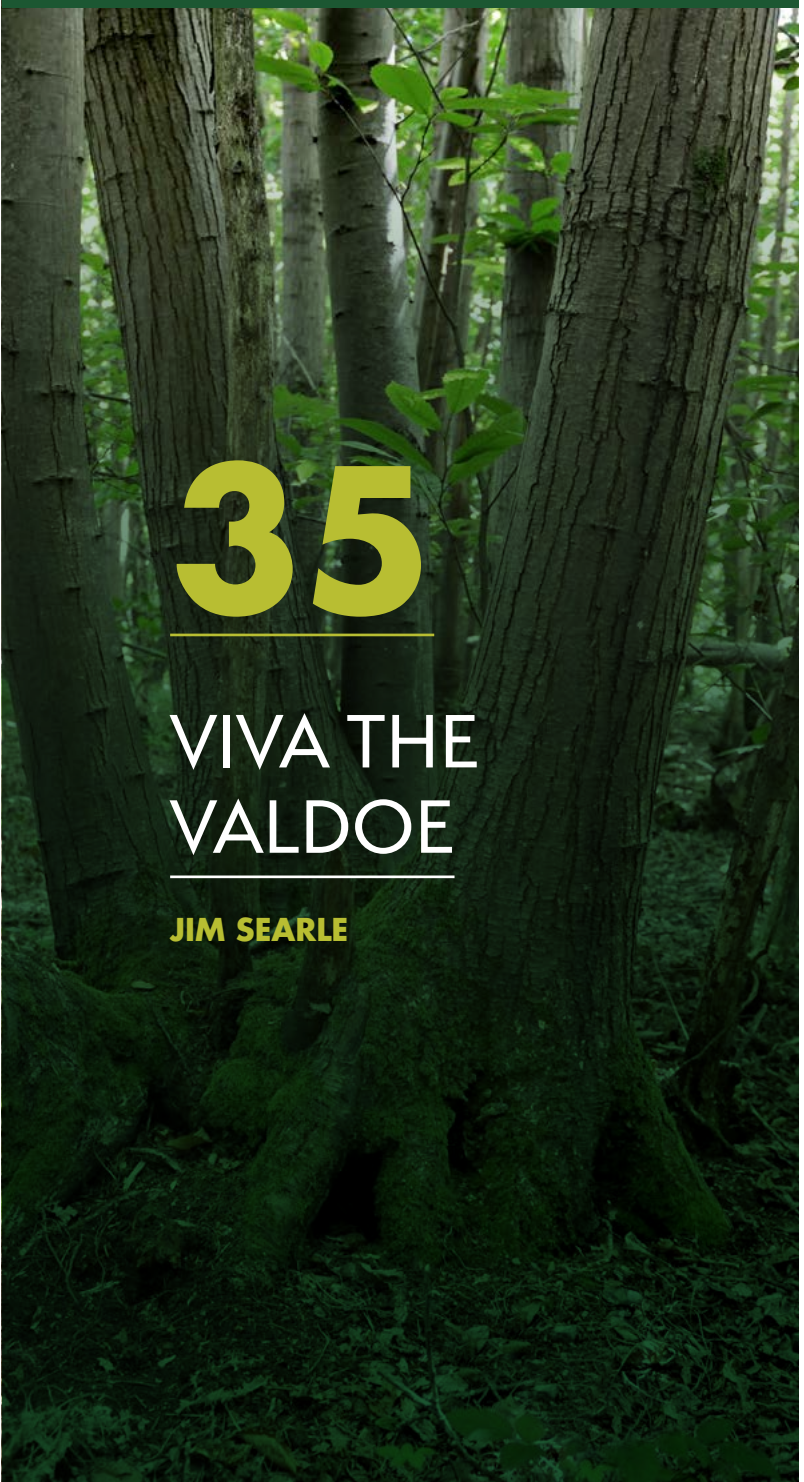
Some early maps are beautiful and breathtaking in their own right. This is Oliver Whitby's colourful Harting Estate map of 1694 in the West Sussex Records Office.

A view of the village of South Harting from the downs. Note the copper-plated church spire at the western end of the village.

Harting Estate map of 1694 was my first. They are the tangible links to those pasts. And some of them are breathtaking.

In the end, it was enough to focus on the more accessible 17th- to 19th-century archives, and to be content with small triumphs. To learn that Pads Wood hid a second ice-house was a revelation to me if no-one else; to know that a lime kiln discovered by a field survey in Hale Wood was probably the one marked on an 1726 map was a satisfaction. To learn of names such as Killing Wood, Noah's Bush, The Miscombe and the enigmatic Star Copse, amongst so many, was enough. Trying to validate the 18th-century horse races held on West Harting Down was ultimately not successful. But I discovered so much more on the way – how 'fifty men came up from Harting each day'. These workers had tenanted cottages with pigs and hens; there were sixteen woodsmen in the beech woods and 800 deer in 900 acres; there were dewponds, kilns, quarries, mills and forges; horses and carters, shepherds and stable lads. The effects of so much activity have left their shape and structure on the land. And it was a vibrant place, so full of life.

In the end there were no great discoveries, simply a confirmation of the fieldwork (or ground-truthing) by the High Woods volunteers. Finding the historical truth is difficult; whether looking at archives or prehistoric flint tools, it always involves some subjectivity. But just standing on the downs, watching a wake of buzzards (yes, that's new to me too!), you can almost feel, as if by osmosis, the history beneath your feet, as you tread the swell and sink of the land, knowing you are not the first, nor will be the last. In any loved place, the field where you walk your dog, the regular footpath, a well-known ramble, you can sense the truth, if you want to, of that ancient enchantment. This project inspired me to look more closely and wonder more often. I hope it does you.



35

VIVA THE VALDOE

JIM SEARLE

THE LIFE OF THIS 'COPPICE WITH STANDARDS' EXTENDS BACK TO DOMESDAY and beyond. The name Valdoe probably comes from Old English 'weald', meaning 'forest' and/or 'domain', with its second syllable implying that it was enclosed. This ancient woodland is approximately 4.5 kilometres (2.8 miles) north-east of Chichester, and is divided by the parish boundary between East Lavant and Westhampnett.

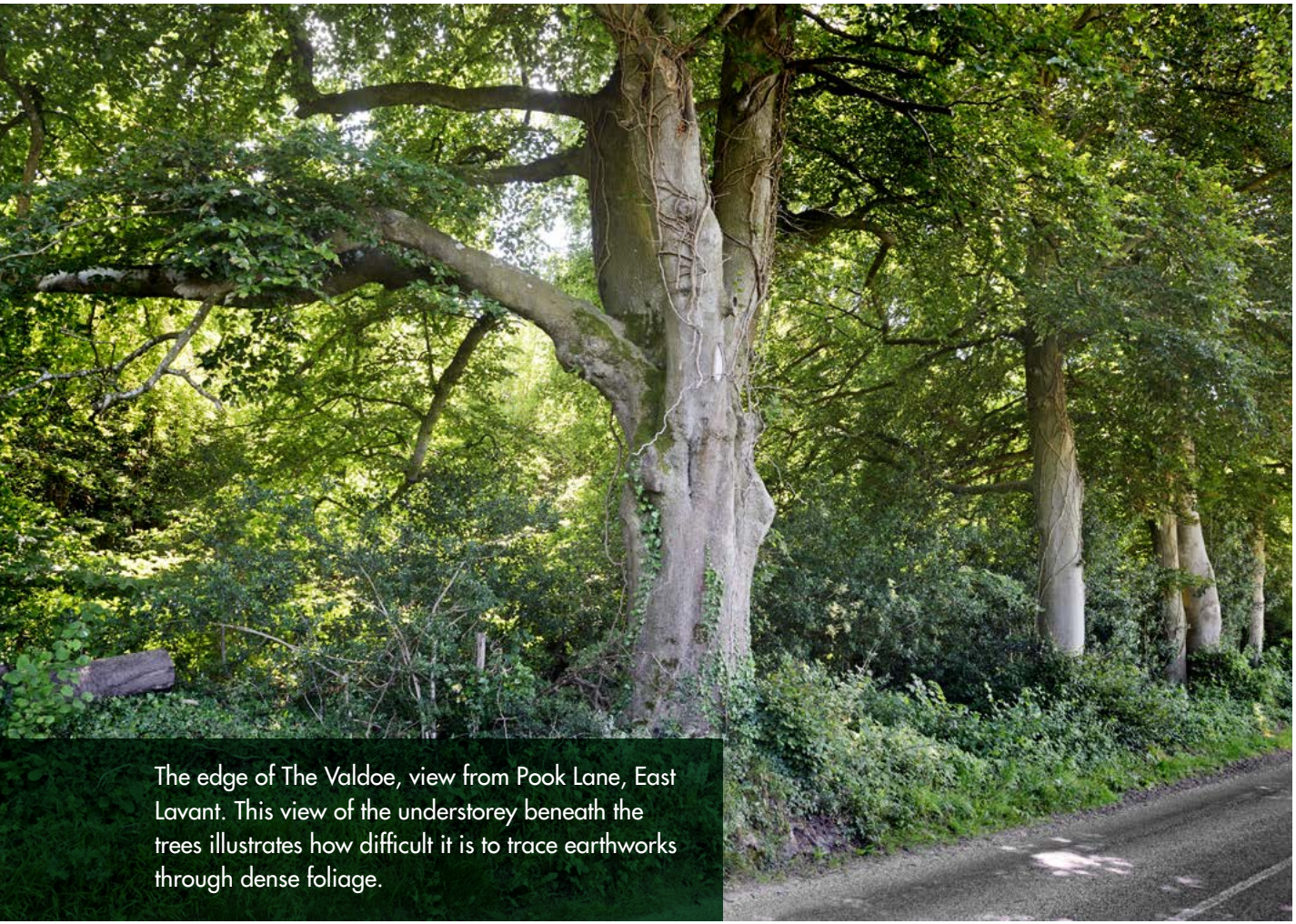
LiDAR imaging indicates a prehistoric field system beneath the present-day woodland. In addition to the well-documented Devil's Ditch, which is probably late Iron Age, there are other trenches on the northern edge of the woodland that suggest a much more recent military presence.

> Up above Goodwood were American and Canadian soldiers and … right up to East Down and round and we were playing in amongst them. And I always remember when they cleared off – they left the tanks in the fields and we used to go up there and sit in and get the turrets going round, cos they were all battery operated turrets then. But here we are: ten fingers two legs, nothing blown off.
>
> Basil Osborne

One of The Valdoe's enduring characteristics has been the value of its timber. The Valdoe, referred to as the Faldy or ffaldy Coppice, was the subject of a tithe dispute in 1758. Depositions by Henry Newman and James Eldridge, both East Lavant worthies, recalled every 10th faggot, a three-foot bundle of sticks used for fuel, being set apart for the clergyman between the years 1676 and 1720. This particular dispute may have resulted from a reluctance in 1758 to continue tithe payments; quakers and other nonconformists objected to payment of tithes to the parish church.

Goodwood Estate's 'Standing Timber survey and valuation book', dated 1802, recorded the total amount of oak timber in Valdoe Coppice as 2656 trees valued at £6282 11s 6d. As an example, Oak No. 1 (all were numbered) had a girth of nineteen feet and a content of fifty cubic feet; the wood was worth 2s per foot and the Price of the Tree was £5. LopTop (branches from a felled tree) and bark added a further £1 12s, so the standing tree was valued in total at £6 12s. Beech and ash were similarly numbered and valued. The survey ends 'Recapitulation of Timber in Valdoe Coppice £7341 14s 0d'. Sales in 1803 included cordwood, stackwood, faggots and bavins by the hundred, bark and planks, with a total income of £443 2s 3¼d. The area of woodland about a quarter of a century later, in 1828, was 239 acres, about twice the present-day acreage.

In the first half of the 20th century Albert West of East Dean, whose father and grandfather were both in the 'underwood' trade, described coppices, including areas of The Valdoe, as consisting mostly of hazel which was used for hoops, hurdles and spars. He continued 'coppice wood was allowed to grow for eight to twelve years



The edge of The Valdoe, view from Pook Lane, East Lavant. This view of the understorey beneath the trees illustrates how difficult it is to trace earthworks through dense foliage.

for suitable material for hurdles, hoops and spars etc. For fencing, wood grown to twenty five years made better posts.' Other local 'copsemen' described a range of products, including 'pimps', which were bundles of firelighters, and 'bavins', which were faggots for specific ovens – e.g. baker's bavins and kiln bavins. Other products included besoms (brooms made of twigs), stakes, withies and building laths.

A completely different characteristic of The Valdoe has been its association with military activities of various kinds. 'Underwoods', with their limited visibility, particularly at ground level, provide ideal military training areas; they provide cover for defence and surprise attacks. The Valdoe was purchased by the 3rd duke of Richmond in 1775. The duke was colonel of the Sussex Gentleman, Yeomanry Cavalry and Sussex Militia. From mid-1803 the Chichester Barracks housed 1500 men. Training included 'sham battles' – some of which could have taken place in The Valdoe. Nothing was published, however, regarding training trenches in Britain during the Napoleonic Wars. Nevertheless, The Valdoe did witness some famous military visitors. A memoir of the 5th duke of Richmond relates that he, together with the duke of Wellington, Lord Raglan, Sir Charles Rowan and other comrades in arms, walked 'in the glades of the Valdoe, a favourite wood'.

> If you were up on Goodwood grandstand, you look down in the fields, that's where they were, down in there. Camps, massive camps.
> Basil Osborne

During the Great War of 1914–18, training units were based at Chichester. WWI training trenches such as have been identified elsewhere in Britain might be identified in The Valdoe one day, but corrugated iron rivetting and concrete found in The Valdoe's trenches rules out this period, unless the entrenchment was for observation and defence of The Mid-Lavant Wood Distillery Company situated north of The Valdoe, towards Lavant Down. Operational in 1918 and described as an

'explosives factory', it was producing calcium acetate used in cordite manufacture.

The Valdoe appears isolated from other military installations, but, during WWII, Westhampnett airfield encroached over its southern boundary. The Roussillon Barracks in Chichester were initially occupied by the 45th Infantry Training Centre. Battalions of young soldiers, formed from volunteers who could not be posted overseas until 19 years of age, were also stationed there. Together with the Home Guard, they played a home defence role until disbanded in 1943.

Training in the local area is described by a Home Guard member of the Chichester Company. 'A party was sent by lorry to a point near Goodwood Racecourse to establish a Machine Gun Post … a second party sent … to clear them out.' Initially instruction was by NCOs of the Infantry Training Centre, but Canadian regiments were also involved. Harold Taylor, also of the Chichester Home Guard and 'only just turned 15', attended manoeuvres, sometimes with the RAF at Goodwood (Westhampnett airfield).

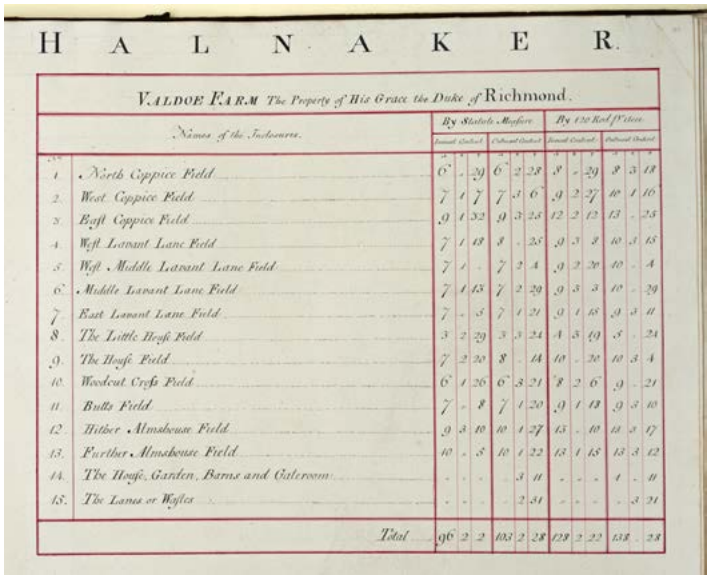
The most northerly entrenchment in The Valdoe resembles a weapon pit, being a more permanent structure of concrete and corrugated iron. It sits on a bank above Pook Lane and provides a view across flattish arable land towards Lavant Down. Those occupying the weapon pit were probably armed with Lewis or Bren guns. Certainly the Home Guard were eventually equipped with Bren guns, answering the pleadings of Colonel Montmorency in the Noel Coward song:

A plan of Valdoe Farm produced for the Goodwood Estate.

With the Vicar's stirrup pump, a
pitchfork and a stave
It's rather hard to guard an aerodrome
So if you can't oblige us with a Bren
gun
The Home Guard might as well go
home.

Westhampnett airfield was developed just prior to WWII. By the start of the Battle of Britain in July 1940 it was used by a squadron of Hurricanes and, later, Spitfires. The proximity of The Valdoe trenches to the Westhampnett airfield, whose aircraft repair facilities encroached beyond the southern boundary of The Valdoe, and the threat of invasion by German paratroops and gliders (Operation Sea Lion, September 1940) support the hypothesis that there might have been an observation or defence station in The Valdoe, possibly manned by Home Defence units.

The 'underwoods' of The Valdoe demonstrate that woods and forests don't have to be full of mighty oaks or towering beeches to be both valuable and enjoyable. These coppiced stands, the sometimes small, shaded and overlooked of the woodland communities, prove the old adage – you don't have to be grand to be great. And when you walk in The Valdoe, knowing its history adds a new dimension to the pleasure. It's impossible not to imagine the ancient farmers, 'woodlanders' and soldiers who knew this 'valdoe'.

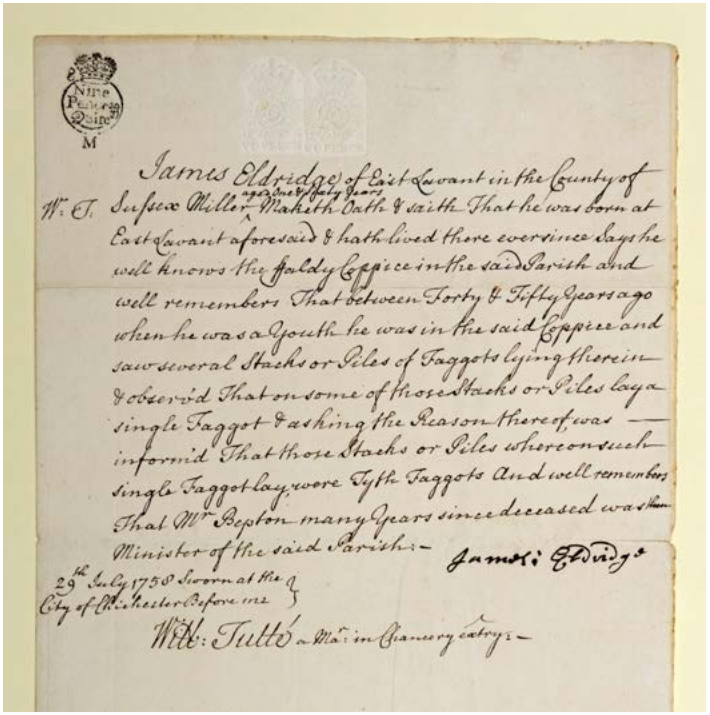


H A L N A K E R.

VALDOE FARM The Property of His Grace the Duke of Richmond.

Names of the Inclosures.	By Statute Measure				By 120 Rod Pole			
	Inward Content		Outward Content		Inward Content		Outward Content	
	A.	R.	P.	A.	R.	P.	A.	R.	P.	A.	R.	P.
1. North Coppice Field	6	.	29	6	2	28	8	.	29	8	3	18
2. West Coppice Field	7	1	7	7	3	6	9	2	27	10	1	16
3. East Coppice Field	9	1	32	9	3	25	12	2	12	13	.	25
4. West Lavant Lane Field	7	1	18	8	.	25	9	3	3	10	3	15
5. West Middle Lavant Lane Field	7	1	.	7	2	4	9	3	20	10	.	4
6. Middle Lavant Lane Field	7	1	15	7	2	29	9	3	3	10	.	29
7. East Lavant Lane Field	7	.	5	7	1	21	9	1	15	9	3	11
8. The Little House Field	3	2	29	3	3	24	4	3	19	5	.	24
9. The House Field	7	2	20	8	.	14	10	.	20	10	3	4
10. Woodcut Cross Field	6	1	26	6	3	21	8	2	6	9	.	21
11. Butts Field	7	.	8	7	1	20	9	1	13	9	3	10
12. Hither Almshouse Field	9	3	10	10	1	27	13	.	10	13	3	17
13. Further Almshouse Field	10	.	5	10	1	22	13	1	15	13	3	12
14. The House, Garden, Barns and Outerooms	.	.	.	.	3	11	.	.	.	1	.	11
15. The Lanes or Wastes	.	.	.	.	2	31	.	.	.	.	3	21
Total	96	2	2	103	2	28	128	2	22	138	.	28

An example of the meticulous recording of different fields on Valdoe Farm for the Goodwood Estate.



Nine Pence Paid
M

James Eldridge of East Lavant in the County of Sussex Miller aged about Sixty years Maketh Oath & saith That he was born at East Lavant aforesaid & hath lived there ever since Says he well knows the Faldy Coppice in the said Parish and well remembers That between Forty & Fifty Years ago when he was a Youth he was in the said Coppice and saw several Stacks or Piles of Faggots lying therein & observ'd That on some of those Stacks or Piles lay a single Faggot & asking the Reason thereof was — inform'd That those Stacks or Piles whereon such single Faggot lay were Tyth Faggots And well remembers That Mr Beston many Years since deceased was then Minister of the said Parish—

James Eldridge

29th July 1758 Sworn at the City of Chichester Before me

Wm: Tuttle a Mr in Chancery Extrx—

W. T.

The Deposition of James Eldridge in 1758. Testimony to the custom of paying tithes in kind to the parish church (see page 113).

36

STANSTED ESTATE – A HISTORICAL JIGSAW

TED HERRINGTON

STANSTED HOUSE AND ESTATE ARE SITUATED IN THE FAR WEST OF SUSSEX, adjoining the Hampshire border. The first house began as a hunting lodge in the 11th century. A successor was built on the present site in 1686 for Richard Lumley. This house burnt down in 1900, and was rebuilt on the exact footprint of the previous building in 1903. It was purchased by Vere Ponsonby, 9th earl of Bessborough, in 1924. The current house is surrounded by earlier grounds, including walled gardens and a chapel constructed from the remains of the medieval house.

> We go back on Stansted many many years. My grandmother was the housekeeper at Stansted in 1890-something … until she married and when I first remember it was little more than a feudal estate.
> Robin Hall

Stansted House, park and grounds are open to the public. The complex contains a variety of attractions to suit most tastes, including a garden centre, miniature railway, maze, sawmill and, of course, a tea room. My particular interest is derived from walking over the estate's public and permissive footpath network over the last forty-odd years, coupled with my general interests in history and the countryside.

Through the Secrets of the High Woods project I have come to realise that the estate is a patchwork of buildings, woodlands and agricultural lands that has developed piecemeal over hundreds of years. What you see today at Stansted is like a giant jigsaw puzzle, with some pieces much older than others, and some of the really old pieces covered up entirely by newer ones! It's quite a challenging job to place these jigsaw pieces in chronological order. But I have always liked puzzles!

The earl of Bessborough's book *Enchanted Forest* set out the basic history and evolution of the area from the Norman Conquest onwards. Starting from the vast estate of the Fitzalan earls of Arundel, the estate shrank to its present size following the sale of the whole estate in 1911 (WSRO SP 1251) and the disposal of the peripheral areas by a further auction in 1913 (WSRO SP 2694). Some unsold lots, especially building plots around Westbourne, were disposed of after the auction.

Stansted House and Park stands in 1700 acres of parkland and forest near Rowlands Castle. It is open to the public.

A plan of Stansted Park dated 1777. Note the extensive tree cover in the Park, and the location of the main house, middle-right.

Now that intriguing title *Enchanted Forest* refers to the transfer of wild beasts from Goodwood and East Dean to Stansted in 1581. I found this corroborated in the 'Survey and Evaluation of 1785' of Stansted for Richard Barwell, which refers to the menagerie in the schedule and accompanying map. It shows a crescent of buildings to the north of the current Lumley Seat with an approximate diameter of fifty metres (145 feet). (Lumley Seat was a former Ionic temple built in 1766–70 by Lord Halifax. It was damaged by fire in WWII and later converted to a private house). This crescent of buildings is also referred to in the sales particulars for the disposal of the estate on 21 May 1805 (WSRO SP 1256). No later mention has been found in the archives to date and no obvious trace shows up on the LiDAR. It may well lie, rather sadly, under a later hard tennis court.

Menageries were a popular feature on the estates of the wealthy over a long period of time as something to show off to other landowners and visitors. For the animals involved the situation was not always good, as ignorance of diet and suitable living conditions often led to fairly short periods in captivity. The demise of this particular example could well have been due to changing fashion. Although drawings and etchings of other notable structures, such as Lumley Seat and Racton Tower (a tower-like folly built in 1772), exist, research to date has not produced a picture of this crescentic complex.

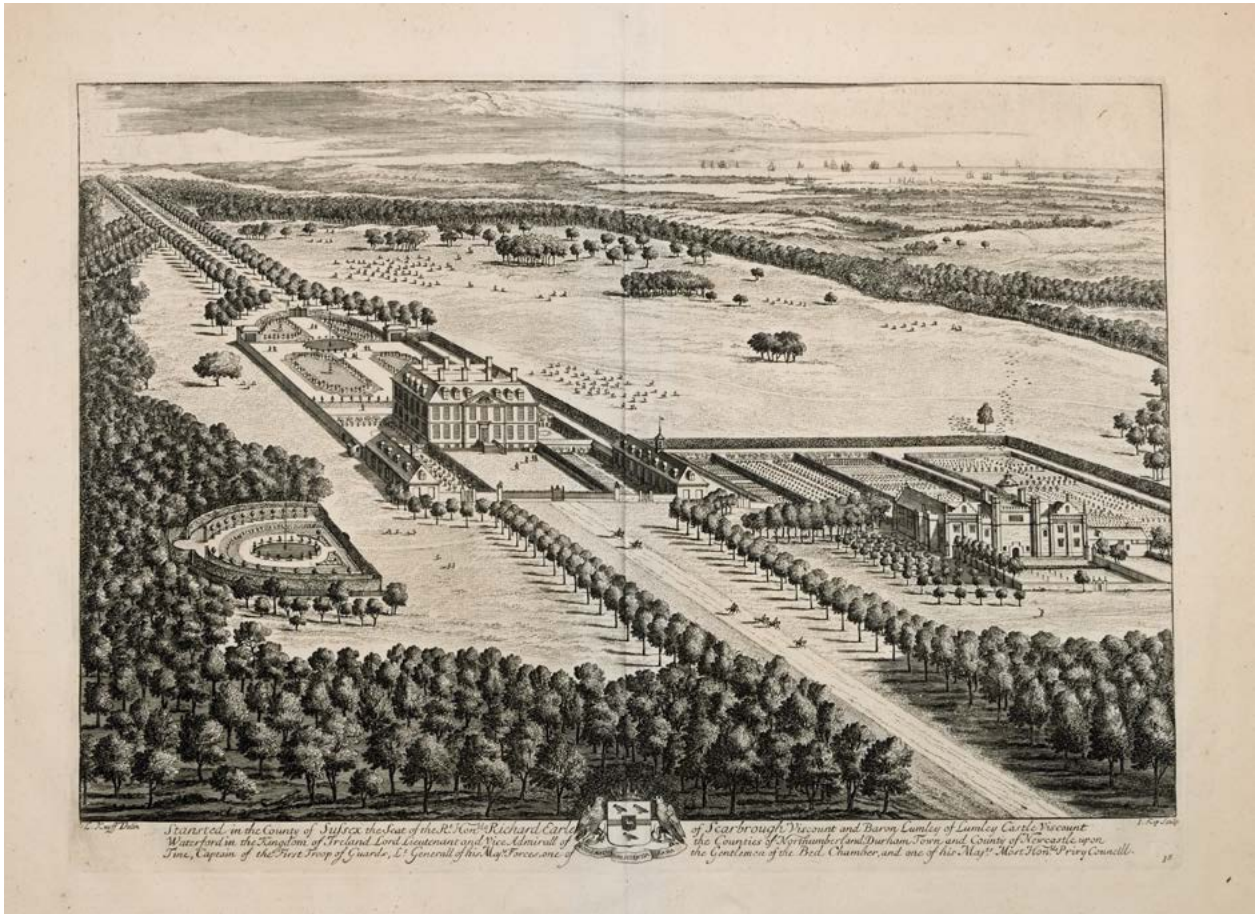
Nearby Rosamond's Hill, crowned by a second possible temple, is shown on an evaluation map of the estate of 1784 and also on the 1805 sale particulars, drawn up for a Mr Weller, who was due to sell the estate at Garraways Coffee House (London) in May 1805. Here it is mentioned as 'Rosamond's Cottage – a flint tower called the Gazebo'. No later references have been discovered, but the location is still referred to as Rosamund's Hill on current maps. Its location over subsequent years has varied between woods and pasture. Another fascinating question raised by this particular enquiry is the identity of Rosamond! Trawling through lists of the estate owners and their families has not yielded a wife, daughter or even a mistress with this name. The elusive Rosamond lies in waiting for future researchers.

Three tithe maps include the estate. The Racton map of 1839 shows an area of brickworks and potteries to the north of the existing brick-ponds and south-west of the current Pond Cottage. Shown on the same map are also hop gardens that are now an area of open farmland. This is one of numerous sites currently adjacent to woodland where land use has varied over the years. Inspections of a series of maps over the last 400 years show that, while the core areas of forest have remained constant, adjacent areas have had a variety of uses. These changes probably reflect differing economic needs in the main, but in some cases, such as gardens, they possibly relate to changing fashions.

Charles Dixon purchased the Stansted Estate in 1826 and lived there until he died in 1855 at the age of 84. He became well known as a benefactor in the area, having made his fortune in the port wine trade. Many of the cottages on the estate date from his ownership, built to provide better housing for workers and also to create employment in the area. As a true Victorian philanthropist he planted orchards in the estate grounds to provide jobs for local people. Traces of these are still evident. In nearby Rowlands Castle he also constructed alms houses for 'six decayed merchants retired from trades'. These continued in use right up until the 1930s. They were demolished in 1971 and the land redeveloped for houses.

One of his jobs was to pick up the morning mail from the post office, collect the paper from the newsagent and cycle up to Stansted, which was two miles through the woods, and give the mail and the papers to the butler, pick up any mail to come back for posting and cycle back again. When Dad was in hospital just before he died, I got that job … . I was fourteen at that time … . I thought 'I know, I'll go early and then I can get back early', so … I went down and picked up the papers and the mail, cycled up to Stansted, went down to the butler and gave him the mail and he said 'Oh you're early', and I said 'Yes, well I'm in a hurry', and he said 'Well I don't think Her Ladyship has finished writing her letters yet', so I said 'Well I'm in a hurry', and he said 'Oh dear, would you like me to ask Her Ladyship to hurry up?', and I said 'Yes please'.

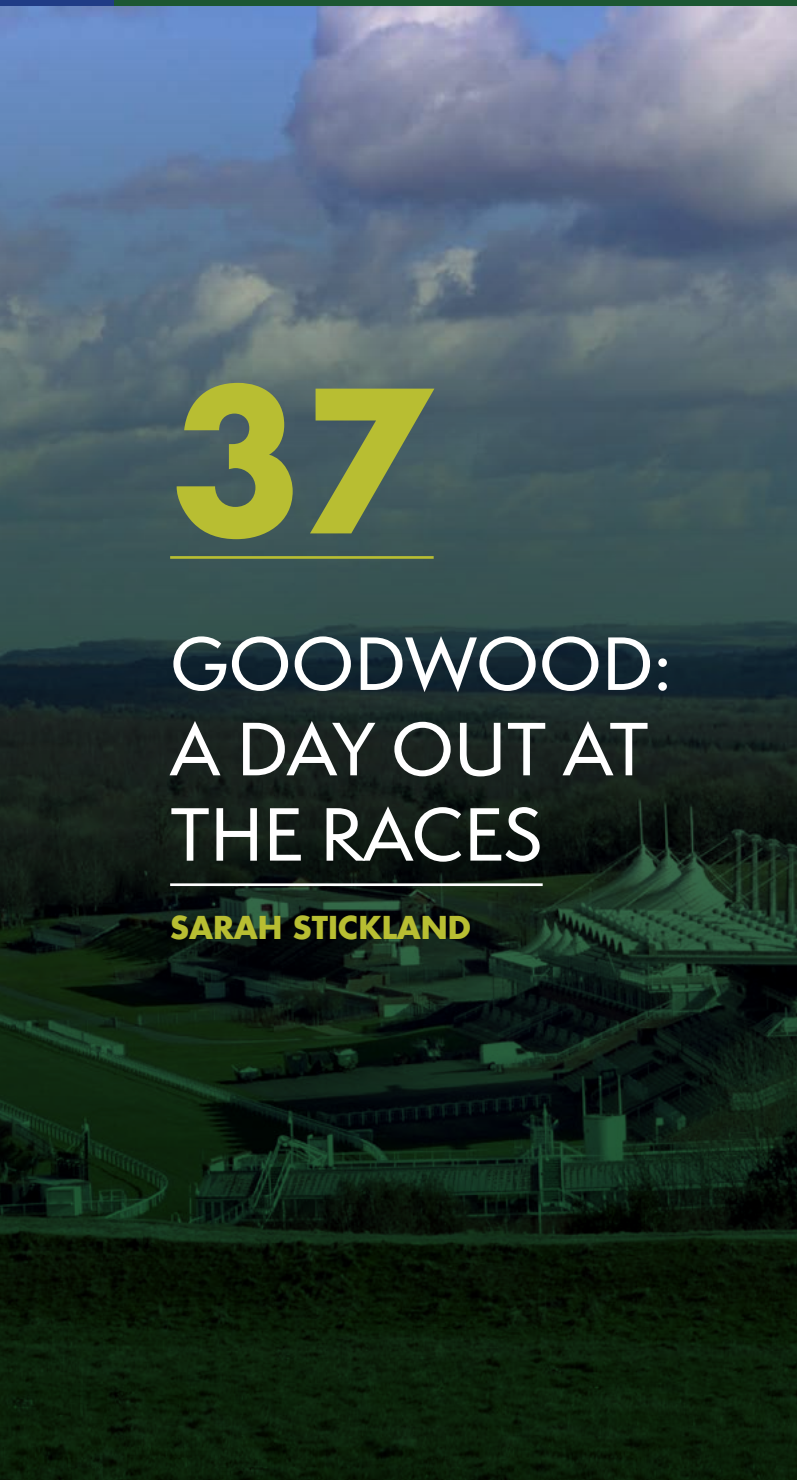
Connie Hayman



This view of 1727 shows Stansted House approached from the west but through a formal, walled forecourt.

To the south of Aldsworth Pond on the Westbourne tithe map of 1840 is marked an area of osier beds – small coppiced willows which supplied long shoots for basketry; it is currently still woodland. I tended to think of basket-making being very much a Somerset trade, but in times of slower transport local basket-works were probably more common. Even within my lifetime baskets were woven in nearby Waterlooville, by a company under the name of Osmond and Osmond.

The LiDAR survey and the Secrets of the High Woods project have provided me with the stimulus to look into the area in much greater detail and greatly increased my knowledge. I have enjoyed finding out about some of these historical jigsaw pieces. These small bits of disconnected information gradually contribute to a bigger historical picture. I continue to walk the estate's footpaths, now furnished with a greater understanding. I am really looking forward to more archival research into the Stansted Estate and other areas of West Sussex. I have the Secrets of the High Woods to thank for that.



37

GOODWOOD: A DAY OUT AT THE RACES

SARAH STICKLAND

ALTHOUGH BAREBACK HORSE RACING WAS AN EVENT IN THE ORIGINAL OLYMPIC GAMES IN GREECE and part of the entertainment of the Roman Empire it didn't begin in England until medieval times – as a way of proving the speed of a horse to prospective buyers. The first recorded race for money, a purse of £40, was run over a three-mile course during the reign of Richard the Lionheart (1189–99). Henry VIII imported horses for racing from Europe and had several stud farms. James I carried on the tradition, sponsoring several race meetings in England. At the time of Charles I's death in 1649 he had a stud of 139 horses. Charles II established Newmarket as the headquarters of English racing, had the first national racing rules drawn up and became known as 'the father of the English turf'. Truly a sport of kings.

Less organised races were also held between two or three owner-riders on their hunting horses, usually on private estates for small wagers or a silver plate. Signs of these races can still be seen in some place-names, such as 'Hunters Race' in Lavant. The 3rd duke of Richmond (died 1672) enjoyed horse racing, as had his father and grandfather, and continued this tradition on from his ancestor Charles II.

After 1799 the Sussex Militia were unable to continue their race meetings at Petworth House. The 3rd duke of Richmond, their commander in chief, invited them to race on the Harroway, a high narrow ridge to the north of Goodwood House, the following year. The duke then built a triangular course just north of the Harroway for the 1801 private meeting, which included gentlemen riding their own horses. In the following year a thatched grandstand was constructed for what had become a three-day meeting, which was now also open to the public. Gentlemen mostly rode their own horses, but on the third day a race was held between the duke's horse and one owned by the king.

> Miss Keef used to walk from Heyshott with her dog to watch the racing. I don't think she went in, but she used to watch over the wall or just enjoy the atmosphere. And the television cameras always used to seem to wait for her, because we used to sit here and watch the racing on the television and just before the racing started, the cameras used to switch to Miss Keef walking along towards the racecourse. First of all you saw the dog and then they used to focus the cameras along his piece of long, long, long string. And at the end of the string was Miss Keef in a very large hat, dressed in a blouse of many colours, or coat of many colours, and a very long skirt right down to her ankles … . She was one of the characters of the racing in those days.
>
> Pearl O'Leary

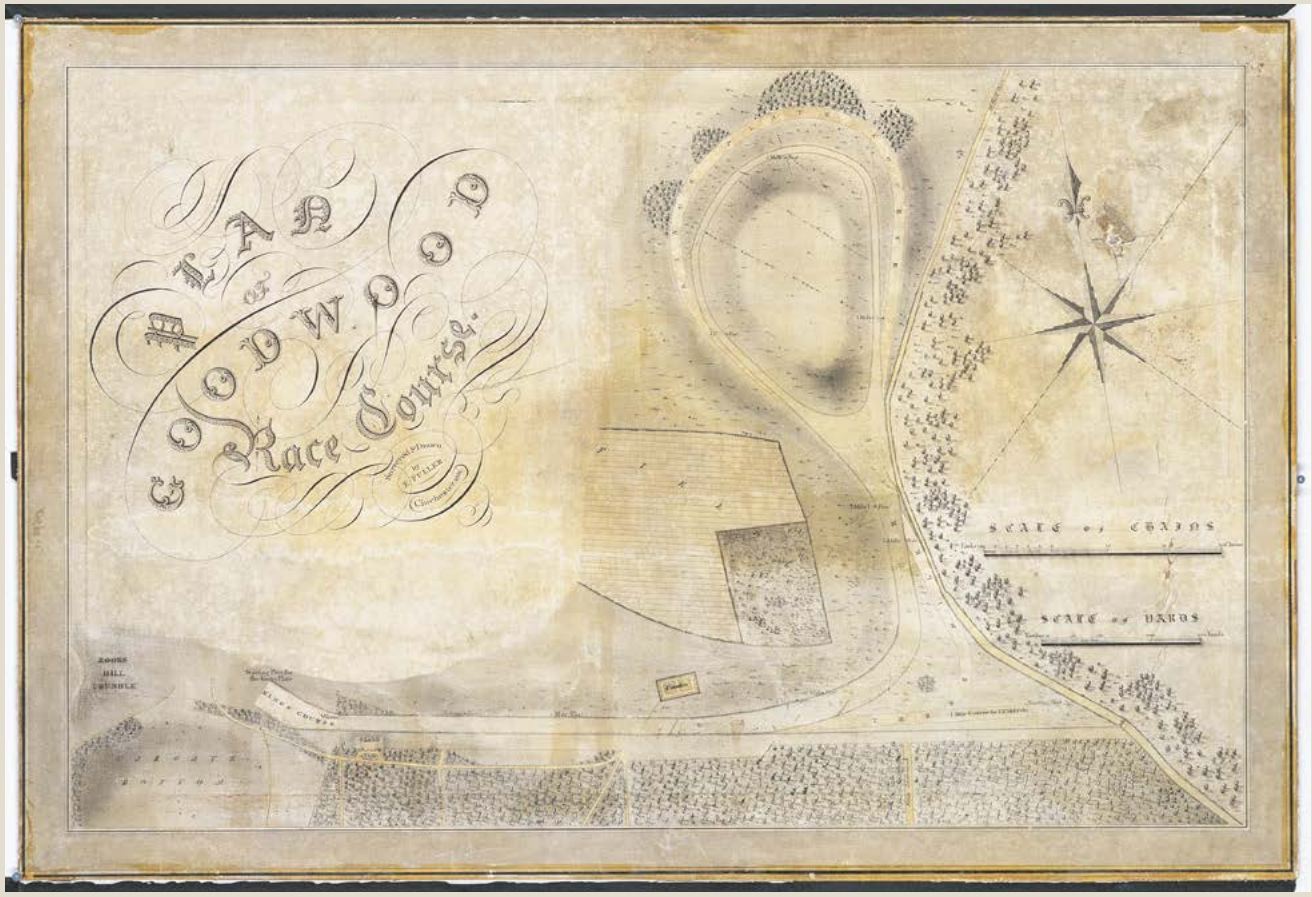
John Marsh describes his visit to the first public Goodwood race meeting in his journal.

It wasn't entirely to his liking. Only attending so as 'not to be left out', he had a 'somber' ride over to Goodwood with Captain Breton and was sat on horseback in the 'broiling sun' until they were tired and jogged home. But he did seemed to enjoy the third day better, perhaps because of the company, giving a lift to Mrs M and returning via the Pheasantry thus 'ending these gay doings'.

> We used to walk up the lane here … and we'd walk across the course and the policeman, 'Oh here come the fillies' he used to say to us.
> Shelagh Lillywhite

The racecourse has been relaid and improved over the years, but the layout is much the same today, with the Harroway making up the finishing straight. The first time the course was relaid was in 1829, which also may have been when Lord George Bentinck first became involved with Goodwood. In the following years he worked with the 5th duke of Richmond to improve the racecourse. After moving all his horses to Goodwood for training in 1841 he spent considerable time and money improving the training facilities there.

To say that no expense was spared making the Halnaker Gallops at Goodwood (also known as the Long or Derby Gallops) is an understatement. In the autumn/winter of 1841/2, 115 men with twenty-eight carts and horses were employed on these gallops at a cost of £3,500. The course was taken through woods called the Winkins, with many trees 'mercilessly' levelled to make way for it. Land was purchased in East Dean just to grow turf and two miles of metalled road laid to transport it to the gallops. The Halnaker Gallops became 'one of the finest in England' and extended to almost two miles.



Courtesy of The Trustees of the Goodwood Collection

A map of Goodwood Racecourse in 1831. The location of The Trundle, an Iron Age hillfort, is marked bottom-left.

What a view of the finishing straight and grandstand at Goodwood! Across the foreground runs the enclosing bank of the Iron Age hillfort known as The Trundle.

These gallops, together with those near the Pheasantry, are still very evident and clearly marked on maps today.

When Lord Bentinck moved his horses from Danebury to Goodwood he also tried them out on a new diet. Cows were purchased so that they could have fresh milk mixed with flour to drink. Eggs were obtained from local farmers so that they could have one dozen fresh eggs with each feed of corn. It took a while for the horses to accept this 'unnatural' diet, but they seemed to do well on it. Lord George wanted only the best for his horses and when the trainer John Kent had to bathe an injured horse, he felt the sponges used were too small. So he sent his valet out twice to scour London for larger and larger sponges at a cost of about £15. They were sent down to Goodwood but found to be too large and heavy to handle easily, especially when wet.

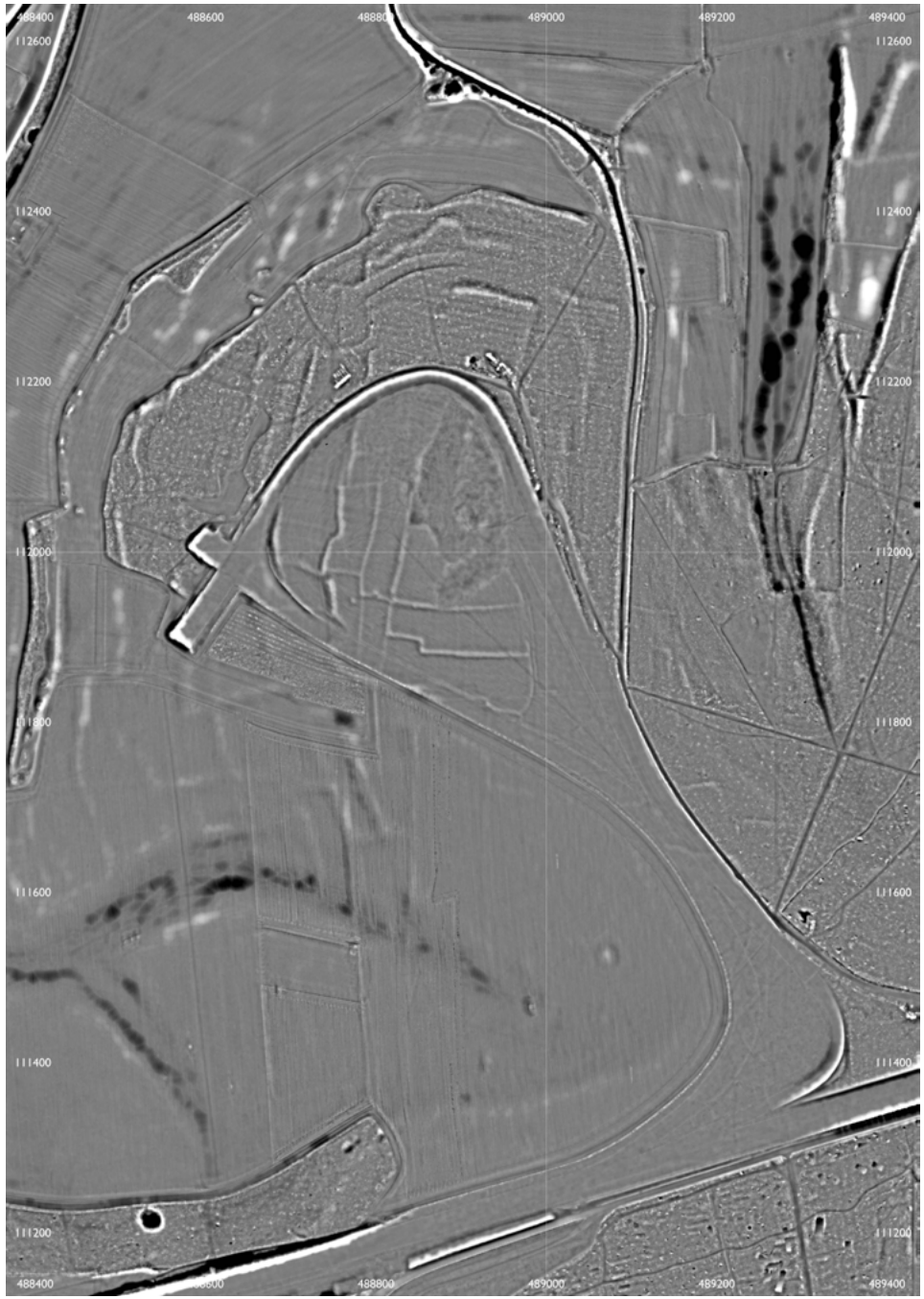
The famous Goodwood racecourse can claim many firsts. Until 1836 all racehorses were ridden from their training stables to each race meeting, wherever it was in the country. Lord George Bentinck came up with the idea of asking a local coach builder to build him the first 'horse box' to transport his horse Elis to the 1836 St Leger at Doncaster. Elis arrived, naturally enough, very fresh and won quite easily. The odds were long and a £12,000 bet netted £61,000.

George Bentinck and the earl of Richmond, both stewards of the jockey club, added to the enjoyment of racing by introducing pre-race parades and public saddling. They also instigated numbers on race cards corresponding with a number board, different priced enclosures and a roped-off area for smokers, so that ladies would not be offended by the smell of tobacco!

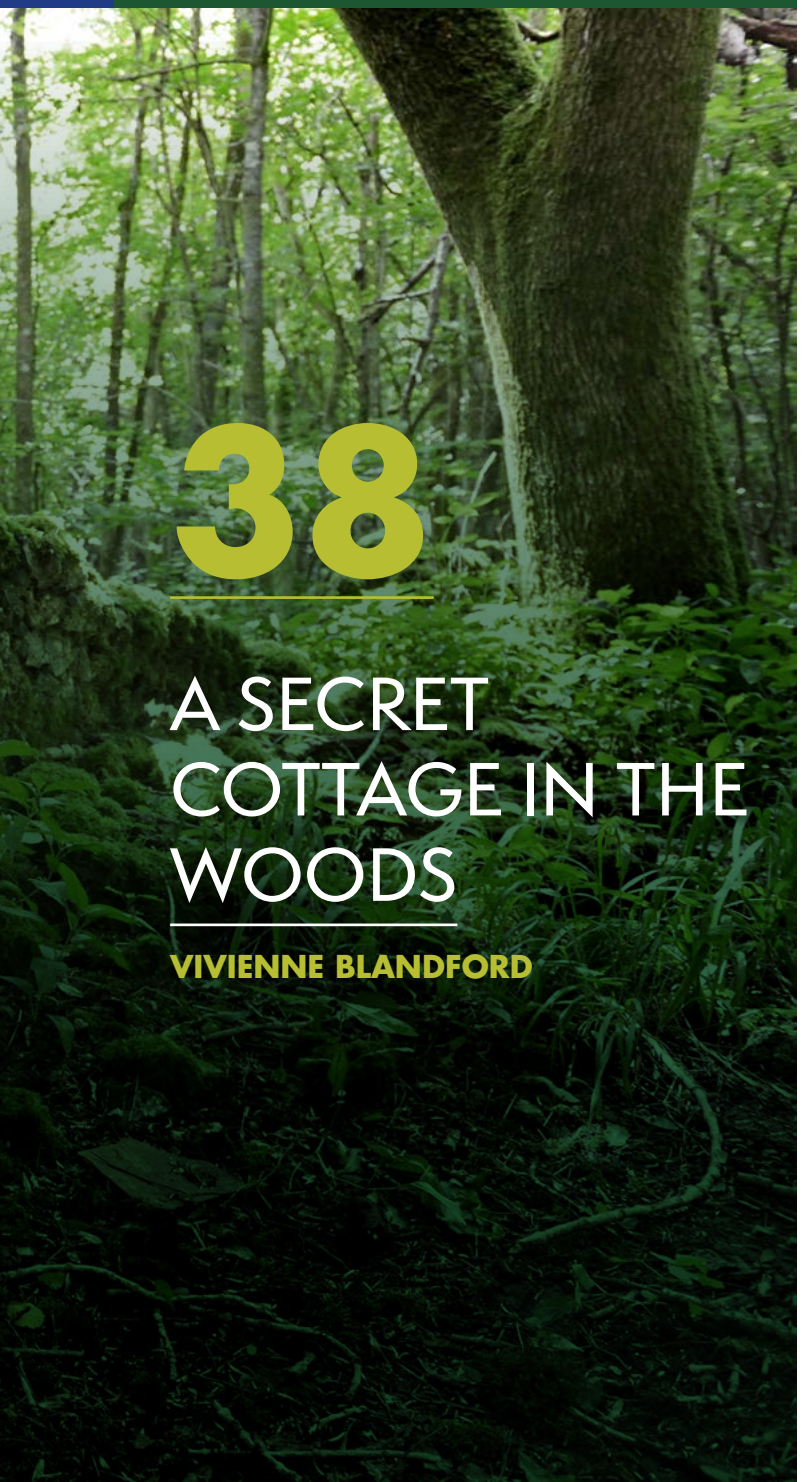
Together they also banned the 'black sheep' (less desirable attendees) associated with racing at Goodwood and some other courses. Those banned sought revenge by taking out a total of thirty-four writs – six of them against Lord George – under an Act of Queen Anne's which stated that any winnings over £10 should be repaid. These writs totalled over £500,000, a very serious sum in 1844. The action was lost on a technicality. The duke of

Richmond's 'Manley Sports Bill' repealed the statute the same year. The duke also banned all 'roulette-table keepers and thimble riggers' from Goodwood, believing that excessive gambling at other racecourses had been the 'ruin of hundreds'.

Finally, Goodwood was the first to use a flag to start a race. Races had previously been started by either shouting 'Go' or 'No'. Riders had often been confused by the elderly and deaf starter at Goodwood, who mumbled and had a speech impediment and was once misheard by half the field. As a consequence the latter didn't move, while the other half galloped off into the distance. The crowd made such a 'rumpus' that stewards held an enquiry and thereafter the start of races was signalled by the dropping of a flag. This 'sport of kings' thus gradually became a national sport for the enjoyment of many. Goodwood played a pivotal role in facilitating that transformation. Lord George Bentinck would have been a very happy man.



A LiDAR image of the racecourse at Goodwood, with the grandstand clearly prominent. There are extensive traces also of earlier field systems.



38

A SECRET COTTAGE IN THE WOODS

VIVIENNE BLANDFORD

PERHAPS THIS SITE WAS MEMORABLE BECAUSE, JUST FOR ONCE, the surviving archaeology was recognisable and understandable to the volunteer and, with careful searching in the undergrowth of the plantation, visible. It was clearly marked on the 1874 map and as a ruin on current maps. The LiDAR images proved that there were substantial remains of walls surrounding the property to be recorded, illustrating a similar footprint to that indicated in the early maps. However, although it is recorded as Bepton New Farm in a document of 1799, was this site really big enough to be classed as a farm? And if it wasn't a farm, what was it doing there? So we did, as ever, have some questions to answer.

LOCATION

Bepton New Farm is located immediately south of the ridgeline of the South Downs Way close to Bepton and Cocking Down. It lies within the Cowdray Estate and is surrounded to the east, west and south by the mainly conifer plantations of Linchball Wood, Venus Wood and West Dean Woods. It nestles close to the southern boundary of Bepton parish.

GEOLOGY AND TOPOGRAPHY

The 'farm site' and the nearby woodland plantations are situated on poor, thin soils overlying white chalk with flints. The remains are located at the beginning of the left fork of a dry valley which, at this point, is very steep-sided and totally encloses the site tightly. The dry valley is very obvious on the LiDAR image as a dark shadow. It's not a place that gets much direct sunshine, although that might have been different before the plantation grew to full size. The flint walls have tumbled down, now coated green with mossy growth, and are partially obscured by fallen timber. It's also dark amongst the scrubby woodland that today has colonised the old garden site.

> To my mind it's like going out into the countryside … while we know there's a farmhouse here, here and here… but you don't know how they relate to each other, you don't know what was happening in these farmhouses, you don't know necessarily when they were occupied, were they occupied at the same time or did people move from one to the other and then to the third? So we don't really understand them in context and what the project's doing, hopefully, is filling in that massive gap … so that we understand the landscape as a whole.
>
> Rob Symmons

HISTORICAL BACKGROUND

The first known mention of the New Farm buildings comes in a 1799 document in the Cowdray archives which is a 'measurement of Bepton New Farm', in the occupation of Robert Underwood, owned by William Stephen Poyntz Esq., giving a total acreage of land on Bepton Down and names and acreages of three fields on Linch Down. Also

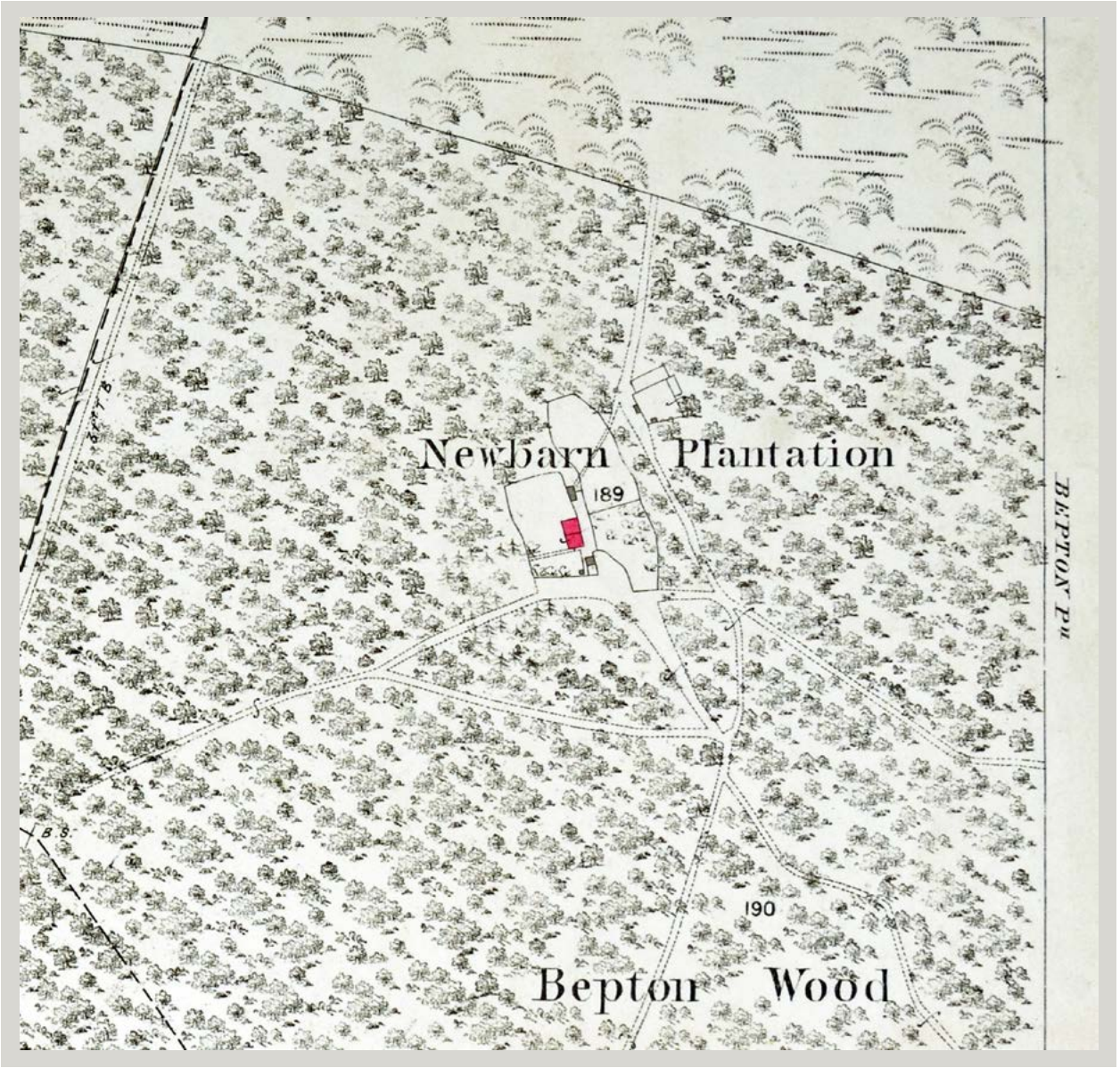
recorded are a house, gate and hedges on Linch Down, followed by field names descriptive of their location: Bottom Field, Middle Field and Long Field.

The 1838 tithe map for Bepton shows the layout of the farm and its accompanying fields and roughly corresponds to the information contained within the document. In the accompanying tithe apportionment the owner and occupier is listed as being William Stephen Poyntz, the same owner as in 1799. Poyntz married the heiress to the Cowdray Estate in 1794. He was also a Whig member of parliament and lived at Cowdray Park. Perhaps the absence of a listed occupier at Bepton New Farm would indicate that no-one was living here at that point in time. Or, very fancifully, was this William Poyntz's secret cottage in the woods? The apportionment records a homestead, hog pen, garden, fir plantation and underwood, but no arable or pasture land, so it cannot have been a working farm.

LATER MAPS

In 1874 the footprint of the building has changed little, but the mapping gives good detail of the managed landscape immediately adjacent to the cottage. It shows a small, roughly square building to the north-east that did not figure on the earlier tithe map. However, it should be noted that the plantation is now called New Barn and not New Farm.

By 1910 the hog pen and building to the north-east are no longer mapped and there is no detail within the garden, but a well is shown to the rear of the cottage. The plantation name has reverted to New Farm. It is clear from the mapping that the gardens were no longer used; in addition, the footprint



This 1874 Ordnance Survey map showing New Barn plantation, illustrates just how surrounded by trees Bepton New Barn farm was.

Deep in the woods – the atmospheric remains of Bepton New Barn – a place of shade, silence and not much sunlight.

of the buildings had diminished, perhaps signalling the end of habitation of this curious building in the woods.

FIELDWORK 17 FEBRUARY 2016

The LiDAR image on the field tablet showed us that there was reasonable survival of walls hidden in the plantation. On the ground a roughly built flint wall survives, partially enclosing the property, in some places to about a metre high. This wall is built against the sloping ground to the west and north, but this has not been depicted on any of the maps. The cottage and its adjacent garden were built up on a raised platform. One imaginative volunteer suggested that this garden had been a rose garden. Perhaps.

The terracing to the north, enclosed by another surrounding wall, reflects the difficulties of managing the sloping nature of this ground. Clearly visible are small beds around 1 metre to 1.5 metres wide, built across the grain of the slope. A great deal of effort went into both making this plot useable and productive, and excluding browsing animals that might eat the produce, although we cannot tell how high any of the walls originally were.

It was not possible to see whether any of the paths shown on the 1874 map had survived, nor was the well located. Another memorial from the time when someone cared for this garden was the snowdrops that were blooming in mid-February, coupled with emerging leaves promising a later show of daffodils. These were on a grassy bank in front of the cottage, where standing house walls survive. It was a suitable spot for the volunteers to stop and eat lunch amongst the snowdrops, with sunlight filtering through the trees. As, indeed, it may well have been for previous occupants.

CONCLUSION

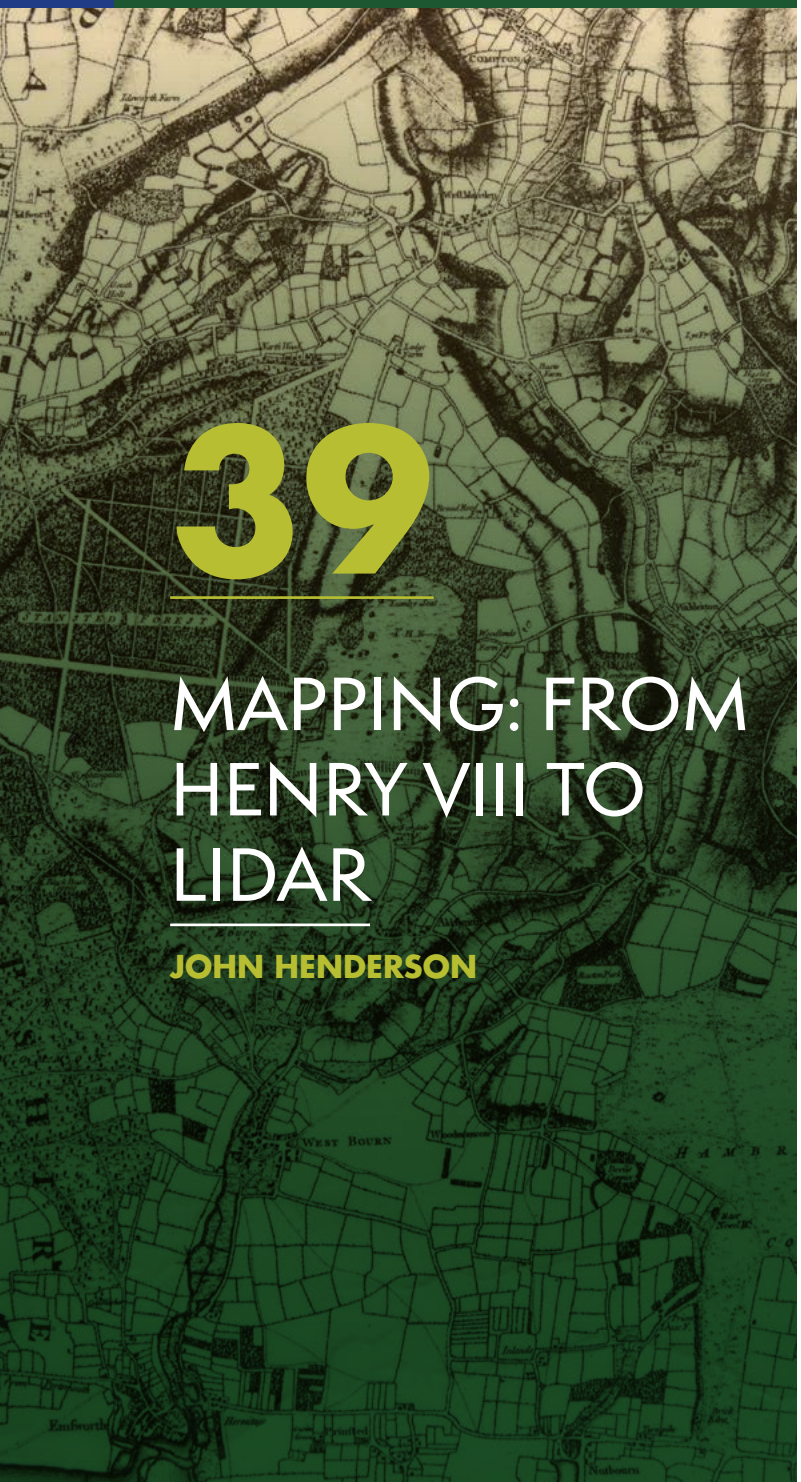
Despite evidence on the ground and past mapping, this 'homestead within the woods' is somewhat of an enigma. Within the wider

landscape depicted on the early maps it has always been surrounded by the plantations, in which there are no other dwellings. Someone had gone to considerable trouble to enclose the two-acre house and garden plot with a flint wall, perhaps to keep deer and rabbits from entering what might have been a productive vegetable plot and garden. Lines of small terraces, carefully constructed, crossed within the garden boundaries from roughly east to west, providing a series of narrow stepped beds. However, as elsewhere within the plantations, the soil was a thin chalky one with flints. There cannot have been an abundance of natural light towards the back of the property, sited as it is at the top of the dry valley with plantations on three sides.

According to the evidence presented in the document of 1799 and tithe apportionment details this dwelling had no arable or pasture land, so cannot have been a working farm. It seems unlikely that a cottage was built to manage the 100 acres of plantation and underwood. So the actual reason for its having been built in this location will remain a mystery.

Whilst the well was not located during the fieldwork it is marked on maps to the rear of the house, so the property and garden had its own water supply. If this supply had later failed it might have caused the demise of the property. Below the house the dry valley flattens out and a forestry track runs down its length. On its eastern side we found a number of saw-pits, testament to past management of these woods. These are now silent, as is the house. That's the trouble with archaeology. Sometimes the surviving remains are recognisable and understandable … to an extent. But most of the understandings of any place lie with people. And, as here, they have usually long gone.

One of the main walls of coursed flint at Bepton New Barn. Nature is a powerful force and ultimately the woods will weaken and tumble the walls, reclaiming the site for themselves.



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MAPPING: FROM HENRY VIII TO LIDAR

JOHN HENDERSON

UNTIL THE 19TH CENTURY SUSSEX REMAINED A RELATIVELY ISOLATED COUNTY, despite its close proximity to one of the great cities of western Europe. The dense Wealden forest made travel to Sussex from the north, especially in winter, very difficult indeed. But Sussex, while a challenge for the traveller, was by no means an economic backwater. Indeed, its economic prosperity enriched the great landed estates that had evolved since the Norman Conquest and which had been supplemented by the property boom after the dissolution of the monasteries under Henry VIII.

The character of the landscape was, broadly speaking, already determined by those centuries of isolation, but was also preserved by a prosperous gentry keen to consolidate their wealth in estates, deer parks, woodland and forests. The wooded estates in the western part of Sussex had fewer landowners per parish than in any other part of the county, and this was a factor ensuring more continuity than change in that landscape. But the need to survey, quantify and visualise the landscape was as strong here as it was anywhere else. Landowners, travellers, Crown servants and military planners increasingly all needed what we take for granted – maps. Although maps of medieval monastic estates were not unknown, until the advent of the professional surveyor in the 16th century a landowner's steward was more likely to compile a written survey of the land, complete with a description of its boundaries.

Before 1790, when the Ordnance Survey began, few people had access to maps. Those who commissioned them, as well as those who used them, did so for a variety of reasons. We know of several maps of England made in the great monastic centres of the 13th and 14th centuries, but it is not until the late 16th century that a map of an English county was produced. While, for instance, the Gough Map, one of the earliest maps of the British Isles, thought to date from 1360, depicts few features of the landscape, it does show the major towns of Sussex, its cathedrals and larger churches, and, importantly, its coastal towns and major rivers. It seems likely that this map was commissioned by the Crown and used by Crown servants such as administrators, tax collectors and lawyers.

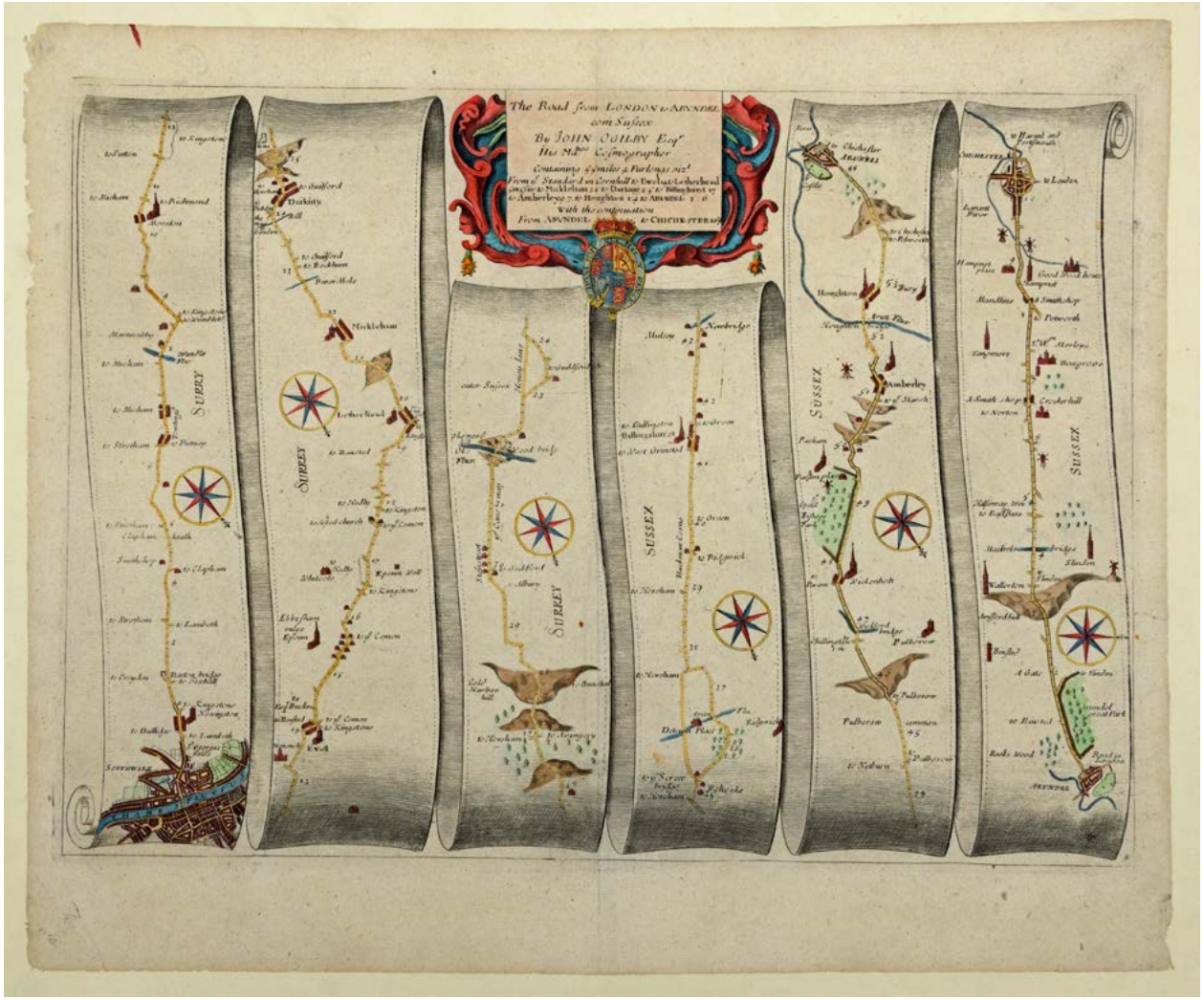
But when Christopher Saxton undertook a survey of the whole of England and Wales, producing county maps between 1574 and 1578, he established for cartographers of the next 400 years the most recognisable and useful cartographic unit ever produced for these islands. Here was a map that could give an instant impression of the character of a county, depicting landscape features as well as towns, hills as well as rivers, defences as well as mere coastlines. It could depict borders in relation to the rest of the kingdom and what was just beyond those borders. Furthermore, the cartographer/engraver could emblazon it with the arms of the county's major families, and all of this information could be taken in at little more than a glance. It must have been truly revolutionary, and altered people's perceptions of the very land where they dwelt. John Norden (1595) and John Speed (1610)

both followed Saxton in producing county maps, including of Sussex, as supplements to written surveys of England's antiquity and topography. As travelling became more common, especially by those on Crown, church or legal business, the county map also became an important tool for national and local government.

There were also reasons for making maps of areas smaller than the county unit. Landowners and their estate managers increasingly felt the need to measure and put a value on every field, pond, warren and wood. The church collected a tithe and wanted to know what revenue to expect. From the 17th century local and parliamentary enclosure further increased the need to measure the land. Property was now a commodity, the sale of which touched the lives of all who lived and worked on it. Legal challenges to changes in property ownership, measurement and value now had to be supported by maps of the disputed area.

A map dating from 1596 of that part of the duke of Norfolk's lands from North Marden, north-west of Chichester, to Arundel and the river Arun appears to show the apportionment of this land by way of marriage settlement to the duke's son-in-law, Lord Lumley. Surveys for such 'business' purposes were increasingly common and the tithe maps of the 19th century were the result of the application of 'estate management' tools on a national scale.

The impetus for the production of more maps by an emerging specialist profession from the late 16th century onwards was also underpinned by developments such as the use of triangulation and scientific instruments such as the theodolite. This resulted in more accurate mapping and the standardisation of measurement and scale. Estate surveys were not new but by the 18th century, with this more scientific approach, they became an essential part of estate management.



John Ogilby's 'The Road from London to Arundel' … and thence to Chichester (1675) shows prominent landscape features of use to the traveller.

Morden's map of the county of Sussex dated to *c.* 1700. The vertical segments of the map are the rapes organised by the Normans in the 11th century.

In addition, in the 18th and 19th centuries there were several developments nationally which demanded mapping on a scale never before seen. No major highways had been built in England since the Roman occupation. However, the construction or improvement of turnpike roads in the 18th and 19th centuries and the coming of the railways to Sussex further broke down the county's isolation.

The increased travel by road made inevitable the first British road atlas. Produced in 1675 by John Ogilby, it included one sheet of relevance to this study, 'The Road from London to Arundel … with the Continuation from Arundel to Chichester'. What Ogilby did that his predecessors could not do on a county scale was conduct a survey from what he saw on the ground, noting hills, rivers and roadside woods, indicating road junctions and man-made features in the landscape, such as windmills, bridges and churches.

Though welcomed by the large farmers, commercial interests, and church and Crown servants, few of the new roads crossed the wooded estates of Sussex. Likewise, the only railway crossing the High Woods project area, the Chichester–Midhurst line, did not open until 1861 and once again had little impact on the surface of the wooded estates. Nonetheless, the development of road travel and the coming of the railways were eventually to fuel the need for the population at large to visualise our landscape.

However, it is with the publication of the first large-scale map of Sussex by Richard Budgen in 1724 that we see a comprehensive use of scale, symbol and drawing to show what the surface of the landscape looked like as well as showing the spatial distribution of towns, roads and rivers. This map had most of the characteristics of a modern map and through use of hachure made the Sussex Downs,

Yeakell and Gardner's map of 1778 showing the downs and Arundel and Goodwood Parks.

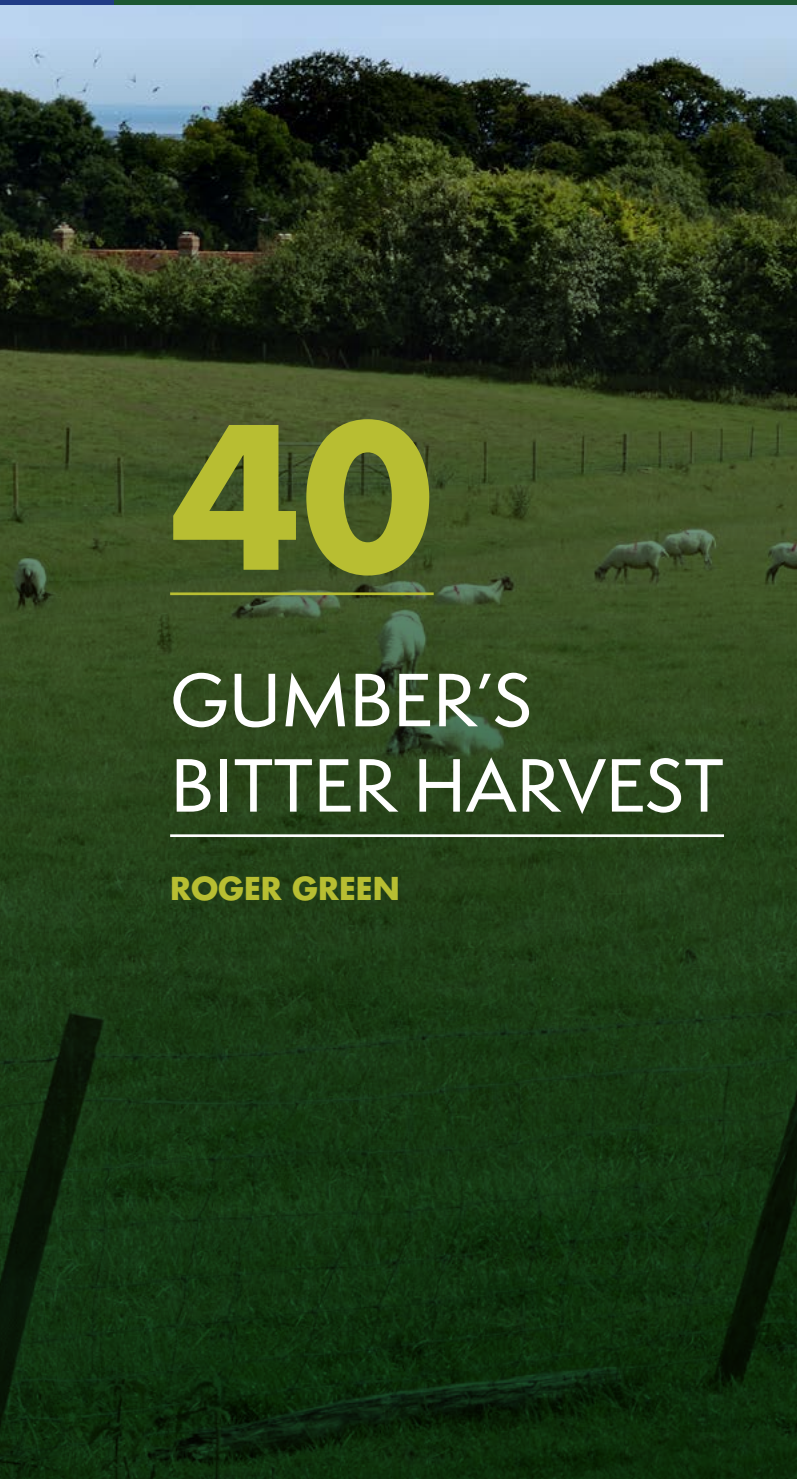
for the first time, a prominent and instantly recognisable feature in the landscape.

Thomas Yeakell and William Gardner's 'Great Survey' of 1778 marked an important step towards modern map-making. Abandoning the picturesque for a more formal representation of all of the features of the landscape, they then brought this more technical, quantitative approach to the Ordnance Survey and set a standard that was to last until the present day.

William Roy supervised the original Ordnance Survey, but Charles Lennox, 3rd duke of Richmond and Master-General of the Ordnance, brought his own Goodwood Estate surveyors, Yeakell and Gardner, to this historic project. It remains one of Britain's greatest and most enduring public works and one which gives Sussex an important place in the history of British cartography. Gradually the Ordnance Survey came to form the standard on which all professions in need of maps came to rely.

From Christopher Saxton's 1575 map of Sussex to the LiDAR images of the wooded estates taken in the western part of the county in 2014 we can trace a common desire to depict the landscape in a way that enables us to better understand its shape, its scale and its detail. But while engravers, cartographers, photographers and digital technicians have much in common, they have invariably been employed for very different purposes. It is this variety of purposes which both enriches and obscures our reading of their maps, because, like the cartographers, we turn to these maps with our own differing reasons for studying them.

In the 20th century the pioneering collaboration between aviators and photographers brought, quite literally, a new dimension to cartography. Finding an immediate reconnaissance role above the trenches in the Great War, aerial photography would go on to aid archaeologists on the South Downs in better and more accurate identification of earthworks previously seen only from the ground. LiDAR images have now also revealed those features on the landscape that were obscured by tree cover. Such developments are little more than the realisation of an image of the landscape that cartographers had craved and simulated for centuries. LiDAR is thus the latest piece of kit, albeit a spectacular one, in the cartographers' toolbox.



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GUMBER'S BITTER HARVEST

ROGER GREEN

IT WAS JUST A SMALL PIECE OF NOTEPAPER, at first glance similar to an everyday sheet of Basildon Bond, but the handwritten note had huge significance for a farmer, his family and his workforce on a remote part of the South Downs. Six months after signing to renew his lease for Gumber Farm, a couple of miles north of the downland village of Slindon, near Arundel, it must have been with a heavy heart that William Parlett picked up his pen again on 23 September 1884 to write a few sentences handing the farm back to his landlords. For fourteen years William, his family and his labourers had toiled on the flinty soil of 600 acres of pasture, arable land, woods and downs, but the tightening grip of the agricultural recession in the second half of the 19th century finally took its toll.

I came across his letter, pinned to the 1884 lease, in a package of documents tied up with a pink ribbon and aptly labelled 'Slindon bundle' at the West Sussex Record Office in Chichester. I had already sifted through dozens of pages of formal, stiff and starchy papers, so the highly personal note from this anguished farmer stood out as a moving testimony to the harsh economic realities of his times. He wrote:

> Dear Sir, in consequence of the great deterioration in value both of corn and stock since I agreed to hold the Gumber Farm, I feel compelled to give you notice to quit, although I feel grieved at so doing, but if times do not materially alter I cannot possibly hold it and I see no chance of anything better at present. Hoping you will take no offence and thanking you for past favours, I remain yours very truly, William Parlett.

What must have been going through his mind when he wrote the letter? The language of the letter seems too restrained, as if William was holding back the pain. Thoughts about who he was letting down – his wife, his children, his workforce, who depended on him for their livelihoods. Worries about his own future, about having to compete, probably with other farmhands, for a place on someone else's farm. Concerns about losing the family home, and fears for whether they would ever find decent accommodation again. He is aggrieved, defeated perhaps, but still loyal to his landlords. For ultimately his predicament is not their fault.

The two leases point to the struggles facing farmers at the time: the rent actually falling from £270 per annum in 1870 to £205 at the renewal in 1884. Not even a reduction of almost 25 per cent could make Gumber Farm viable. It had been a different matter earlier in the 19th century, when two extra barns were added to the farm and the labourers' cottages were extended, some time between the Slindon tithe map of 1832 and the Ordnance Survey first edition map of 1876. But imports of cheap American food, aided by the relaxation of trade tariffs through the repeal of Britain's Corn Laws in 1846, led to a steep

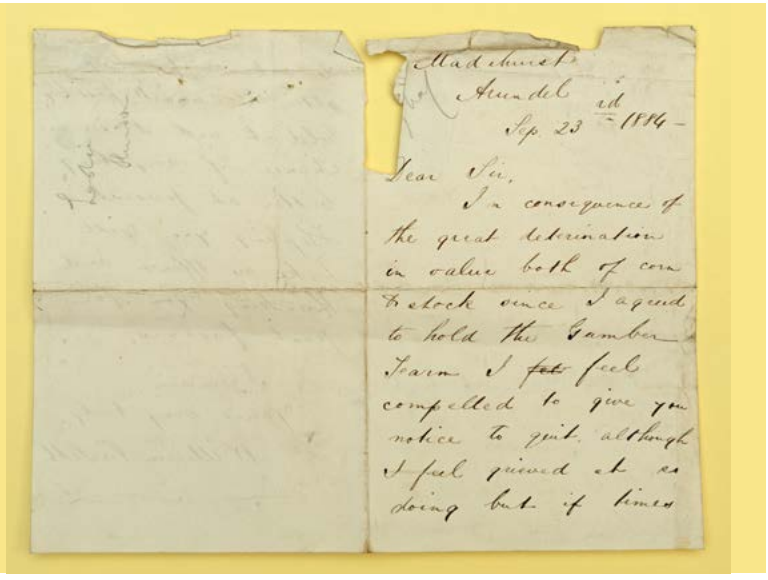
decline in the fortunes of agriculture, with the tenant of Gumber Farm and his workers among the casualties.

> The Gumber, which is an area of the estate which is adjacent to Stane Street, the Roman road which runs through the estate … and it's a high point, and from that point you can actually see Chichester and the sea … they built a decoy airfield. The decoy airfield was built to mimic Tangmere airfield … . It had planes on it that were made of plywood and canvas. These were all made specially to go there and they were Hurricanes and Spitfires mainly, and they were made at a company called Green Brothers in Hailsham. Green Brothers used to make deck chairs.
>
> Rodney Gunner

By 1886, when a new tenant, James Penfold, signed the lease on Gumber Farm, the rent was even lower, just £100 a year, but even at that level he resorted to action beyond what was allowed legally in a bid to make ends meet. He seems to have got away with it for a few years, but by early 1896 was asked to pay royalties on 200 tons of flints he had removed from the farmland and sold on. He was in breach of a clause forbidding quarrying, mining and extracting clay and stones, but in January 1896 he signed an agreement allowing him to remove the flints on payment of a royalty of 8d per

Gumber Farm, near Slindon, once part of the home of William Parlett and his family. The falling prices for corn and animals in 1884 forced them to leave the property.

Slindon parish map of the 1850s. Note the location of Gumber Farm centre-right, and the straight diagonal line of Stane Street to the north of the farm.



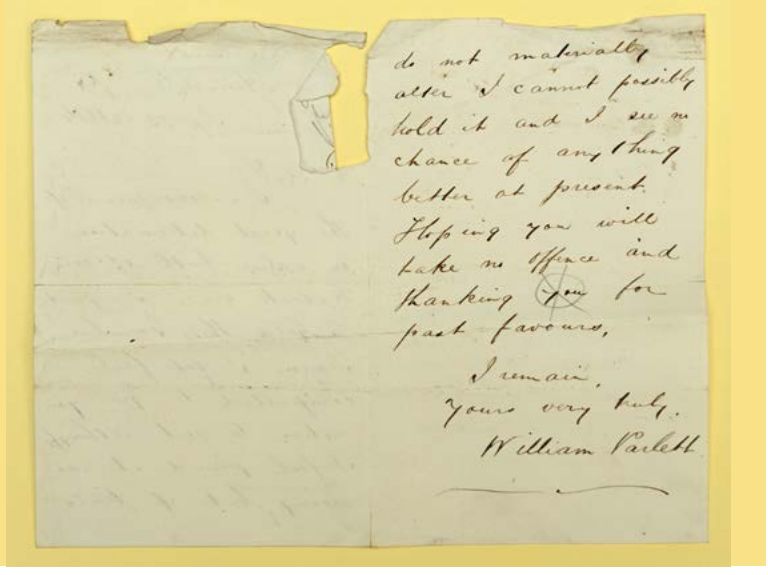
Gladhurst
Arundel
Sep. 23 1846

Dear Sir,

In consequence of the great deterioration in value both of corn & stock since I agreed to hold the Gumber Farm I feel feel compelled to give you notice to quit, although I feel grieved at so doing but if times

'… although I feel grieved at so doing …' – these short phrases mask the anguish of a farmer who could not make ends meet for his family.

'Hoping you will take no offence …' – William's final and resigned letter to his landlord.



do not materially alter I cannot possibly hold it and I see no chance of anything better at present. Hoping you will take no offence and thanking you for past favours,

I remain,
Yours very truly,
William Parlett

ton to his landlord, the trustees of the Slindon Estate. It seems ironic that he should have been penalised for improving the farm's soil by removing the stones that, throughout history, have plagued farmers on the downs.

> The German: there is a rumour that … they actually did fly over one day and drop a wooden bomb which bounced over the airfield, with the word decoy on it.
> Rodney Gunner

Around Gumber Farm that history can be found in abundance, and the Secrets of the High Woods LiDAR survey has added to the evidence of how farming in the area can be traced back 3000 years, when Bronze Age peoples created a latticework of fields, enclosures and trackways on the downs. Cultivation continued through the Iron Age to Roman times, when Stane Street was built to link Chichester with London. Marching across the landscape just north of Gumber Farm, this ancient roadway, with its impressive embankment, reaches its highest point, 700 feet, at nearby Gumber Corner, enjoying fabulous vistas that take in Chichester Cathedral, the Solent and the Isle of Wight. No wonder it was one of the writer Hilaire Belloc's most precious places.

I was fortunate enough to interview amateur archaeologist Robin Upton for the oral history strand of Secrets of the High Woods, who told me about the thousands of ancient artefacts, including flint axes, he found while working on the land around Gumber Farm. Many of his finds are logged on the Historic Environment Record, tagged as 'the Upton Collection'. Robin too, however, got into trouble for picking up those stones. His boss chastised him for being just a little bit too distracted by clues to the area's past, as, eyes on the lookout for old flint axes, Robin drove his tractor over the fields.

Today, Gumber Farm is still part of the Slindon Estate, now owned and managed by the National Trust, some of whose staff live in the former farmworkers' cottages. There's a bothy, offering simple accommodation, and Gumber remains a working farm. When a team of High Woods volunteers visited the area for an archaeological field survey in January 2016 to check features on the ground picked up by the LiDAR survey, one of our members made an unexpected discovery – a sheep that had become trapped in a WWII air raid shelter. We told the grateful shepherd, who was able to free the ewe. That day, we experienced four seasons in a few hours, from summer-like sunshine and blue skies to brooding clouds and harsh winter hail stinging our faces. It was a reminder of the hard life experienced by those living and working on the land. All the harder for William Parlett, his family and his workers, who left this place in such turmoil all those years ago.

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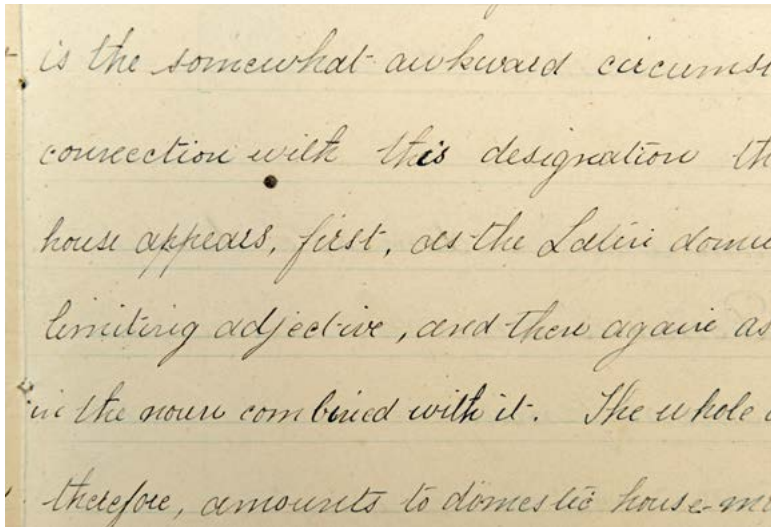
WHAT'S IN THE BOX?

ALI MOBBS

WHEN I FIRST BECAME AWARE OF THE SECRETS OF THE HIGH WOODS PROJECT, my imagination went into overdrive. Perhaps I would go out in the field with LiDAR imagery and discover some ancient settlement never before noticed. Or maybe I could interview a charming old inhabitant of one of the hamlets and record for posterity their story. Then I read about the archival aspect of the project and immediately felt my interest stimulated even further. I had never been to the record office, and had little idea of the wonders therein, but I liked the notion of delving into the past through old documents. Who knows, I might discover something long forgotten, or at least long overlooked!

Once I had registered as a user and received my free reader's ticket, I had a brief introduction to the workings and protocol of the record office. Then, armed with no more than a pencil and paper – no coats, bags or other paraphernalia are allowed in the hallowed precincts – I entered the search room. And so my initiation began. I have a personal interest in schools and education, so chose to focus my research on late 19th-century schooling. After some discussion with the archivist I decided to look at the elementary schools in the area, specifically searching for information about attendance. Schooling became compulsory for all children following a number of Education Acts. My question was simple: 'Could the children of the High Woods get to school?'

Never having done any archival research, I think I saw myself as some latter-day Poirot,



A detail from a West Dean School exercise book, 1887–1891. Note the copperplate writing style.

studiously persistent and about to reveal some long-forgotten secret. I knew detectives had to follow up countless irrelevant leads before they found a useful one. So I was prepared for a long haul. But where to start in archival terms?

The lists of documents specifically relating to schools provided me with my first leads. Under each school is a list of all the documents held in the archives pertaining to that school. Headteacher logbooks seemed the best place to start. The logbook was kept by the headteacher and they were required to make at least one entry per week. Sadly not many logbooks from the 19th century survive for the schools in the area, but one or two do and

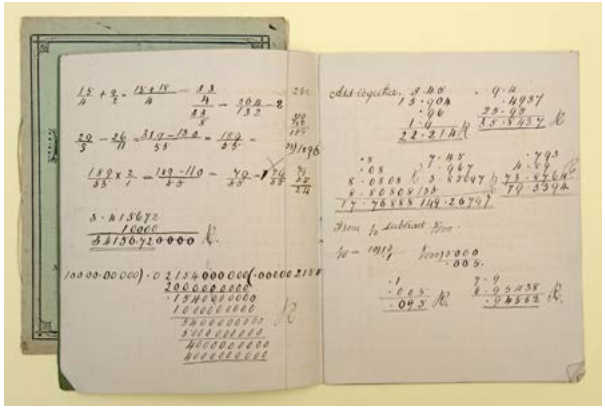
some of the entries provided a fascinating insight into the daily running of the school.

I wasn't prepared for the sense of anticipation I would feel as I waited for my first requested original item from the archives to be handed to me. As I looked at that leatherbound book, slightly tatty and bearing the marks of age, I felt a tingle of excitement and slightly apprehensive. Very carefully, I opened it up. The entries, written in copperplate hand over 140 years ago, in ink that has faded with time, described the day-to-day ups and downs of life in a small village school. Reading the entries, so carefully penned, drew me into another world. Later I requested sight of letter books, minute books and collections of notes, and each time that tingle would recur. It was quite addictive. I was getting hooked. Undoing a small brown paper-wrapped parcel of letters, tied up with a bow, was especially exciting even though the contents proved dull in the extreme. It is that 'what if?' feeling that excites over and over again, almost like a drug. Maybe this time I will discover something amazing.

Once I began to form a picture of life in a village school I wanted to know more about the children. Where did they live, and how far away from the school were they? This led me to the search-room computers and the Internet. WOW!! There are mind-blowing amounts of information out there! Access to **Ancestry.com** is available to all users of the search room, and I started by looking at the national census records, which listed the names, ages and occupations of everyone in an area. Parish records, also available on the Internet, gave more detail of the families, and slowly I became more familiar with my chosen area.

I then went to the map section of the record office and, with help from their experts, began to create a mental picture of where these children resided. The old maps show pathways and trackways, which they would have used to get to and from school. No neat tarmac roads for them. It's no wonder there were frequent references in the logbooks to low attendance due to inclement weather!

Researching in the archives is a bit like opening Pandora's box, although perhaps without the rather disastrous consequences for that heroine of Greek mythology. There is no knowing what is inside, but you can be sure that exploring it will be an adventure. Will this be the day that you uncover that missing bit of the story? Until you start to ask questions and undertake your own research you just don't know what stories are waiting. The possibilities are literally endless. But it sure is fun exploring just one of those possibilities!



Every child's nightmare? A maths exercise book from 1887–1891. The answers were mostly correct!

A selection of West Dean School exercise books from 1887–1891. The one that lies fully open contains interesting insights on Turkey and Afghanistan, and an essay on silk worms.

42

HERE MISS!

ALI MOBBS

THESE DAYS ALL CHILDREN UP TO THE AGE OF 16 ARE REQUIRED TO BE EDUCATED, either in a recognised school or academy or by other means as regulated by legislation. Parents can face prosecution if they fail to send their child to school or remove them from school during term time. Back in the 19th century schooling was much less common, particularly among the working classes, where children were often needed as additional wage earners for the family purse.

> We lived on a farm just on the National Park outside Poynings … . We used to get on the coach at about seven and it used to go all around the villages … so I never used to get home until about ten past five. But … the coach driver would let us get off in Poynings, he would do the rest of his journey, we would go to the shop and play, and then he'd pick us up. Now you wouldn't get that today.
>
> Nigel James

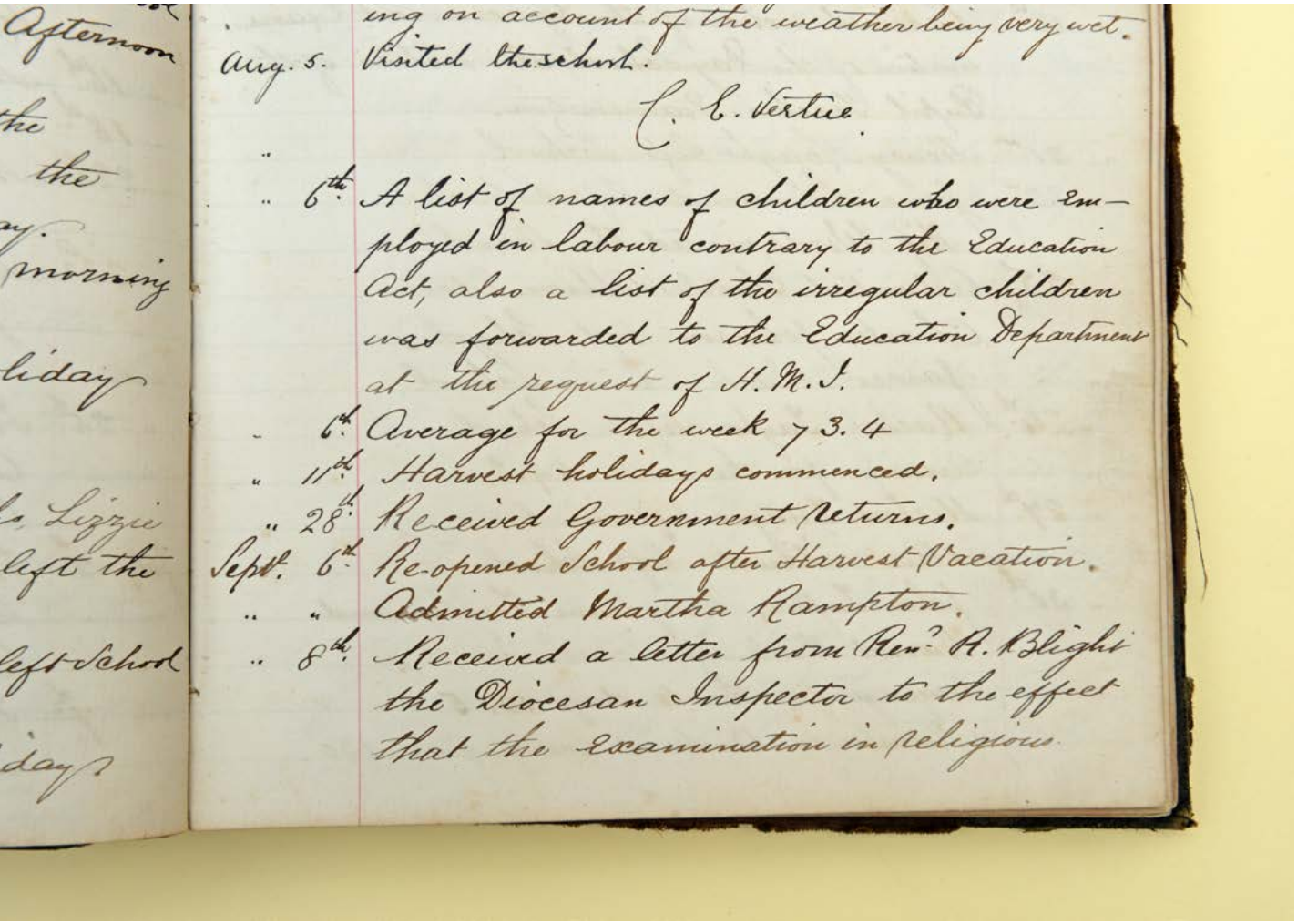
In 1870 an Act of Parliament, the Forster Education Act, was passed. It is recognised as the first piece of legislation to deal specifically with the provision of education in Britain. Included within the Act was the recommendation that all children should receive a basic education, regardless of class or gender. School Boards were set up to provide school places for all children within a prescribed area, and Attendance Officers were employed to monitor their attendance. A subsequent Act (1880) made attending school compulsory, and parents could be liable for a fine of £2 for failing to send their child to school. This, at a time when average weekly wages for ordinary labourers in agriculture were less than 15s, constituted a considerable amount of money.

Within the High Woods area there were a number of village schools serving a rural population. How would these children fare? Would their location and parental employment impact upon their ability to attend the local school?

Children could be expected to travel up to two miles to get to a school, and entries in the logbook of West Dean and Binderton village school reveal that many children lived further away than that. Local maps of the time demonstrate that the children would be using tracks and pathways rather than roads to get to school.

The school logbook contains many references to attendance levels at the school. There are numerous comments that attendance was low owing to adverse weather conditions:

> January 1881 'The roads having become impassable from the very deep snow, the school was unavoidably closed for the remainder of the week.'
>
> 8 June 1885 'Low attendance. Rain.'
>
> 23 January 1890 'Heavy storms of wind, rain and hail – the attendance low in consequence.'


ing on account of the weather being very wet.
Aug. 5. Visited the school.
C. E. Vertue.
" 6th A list of names of children who were employed in labour contrary to the Education Act, also a list of the irregular children was forwarded to the Education Department at the request of H. M. I.
" 6th Average for the week 73.4
" 11th Harvest holidays commenced.
" 28th Received Government Returns.
Sept. 6th Re-opened School after Harvest Vacation.
" " Admitted Martha Rampton.
" 8th Received a letter from Revd A. Blight the Diocesan Inspector to the effect that the Examination in Religious

West Dean school logbook 1873–1890, recording the names of children employed in labour, contrary to the Education Act.

The legislation makes allowances for absence due to illness and for children living further than the two-mile limit. However, many children were still missing school because of occasional employment. The 1881 census for West Dean reveals a population heavily employed in rural and agricultural pursuits. The school record notes that the children of the parish have been absent owing to haymaking, potato picking, blackberrying, hopping (hop picking), gathering wood and getting mushrooms.

4 August 1882 saw the school closed for 'the Harvest Holiday' (this was the precursor to the long summer holidays schools currently adopt, although few children nowadays are required to help out with the harvest!). The school also closed for Goodwood week!

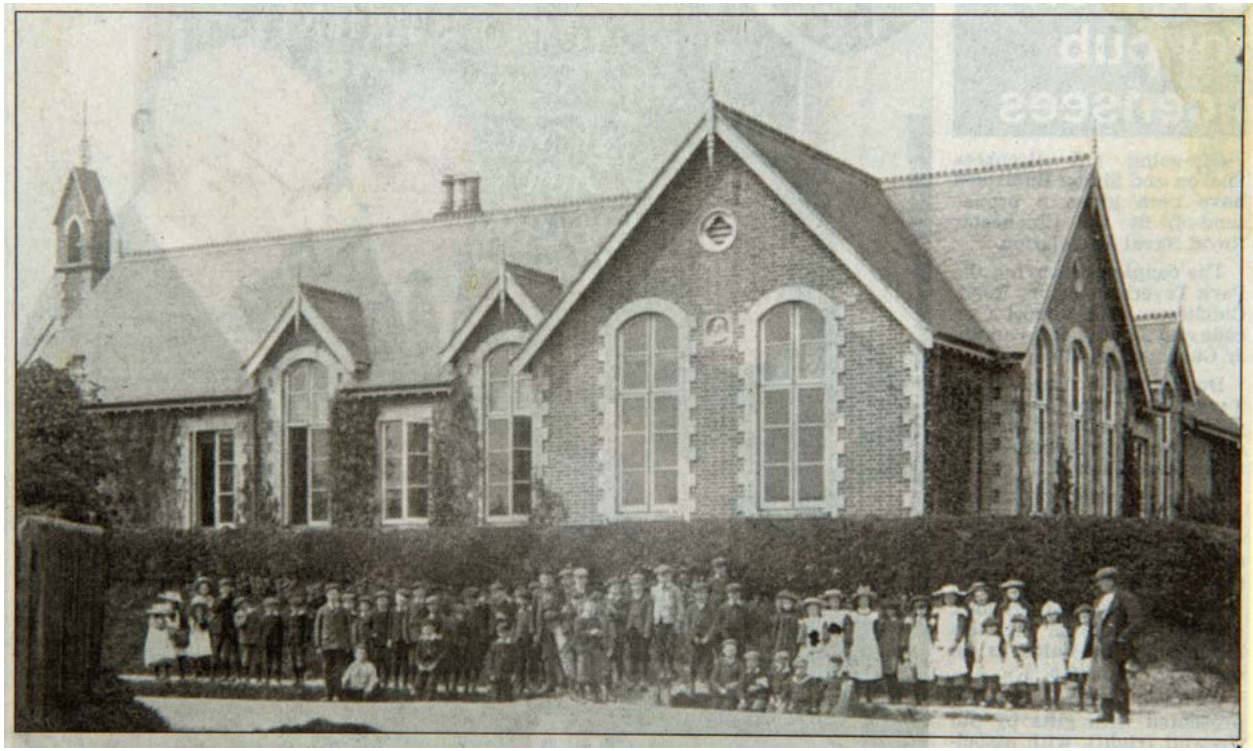
> There were two rooms and it had a great big metal stove thing with a guard round it and we used to have little bottles of milk in those days, and the teacher used to put them inside this guard, and when it came to drink it, it was warm. I can't drink milk to this day.
> Susan Bovis

For comparison, logbooks for the Chichester Central Boys and Chichester Central Girls schools were examined. Did the children living in town enjoy better attendance? Surprisingly, the weather impacted on the attendance levels in the city schools as well.

> 27 November 1885 'Wet weather affected attendance.'
>
> 6 April 1887 'Bad weather and Market Day, attendance low.'
>
> 14 February 1889 'Severe snow, attendance low.'

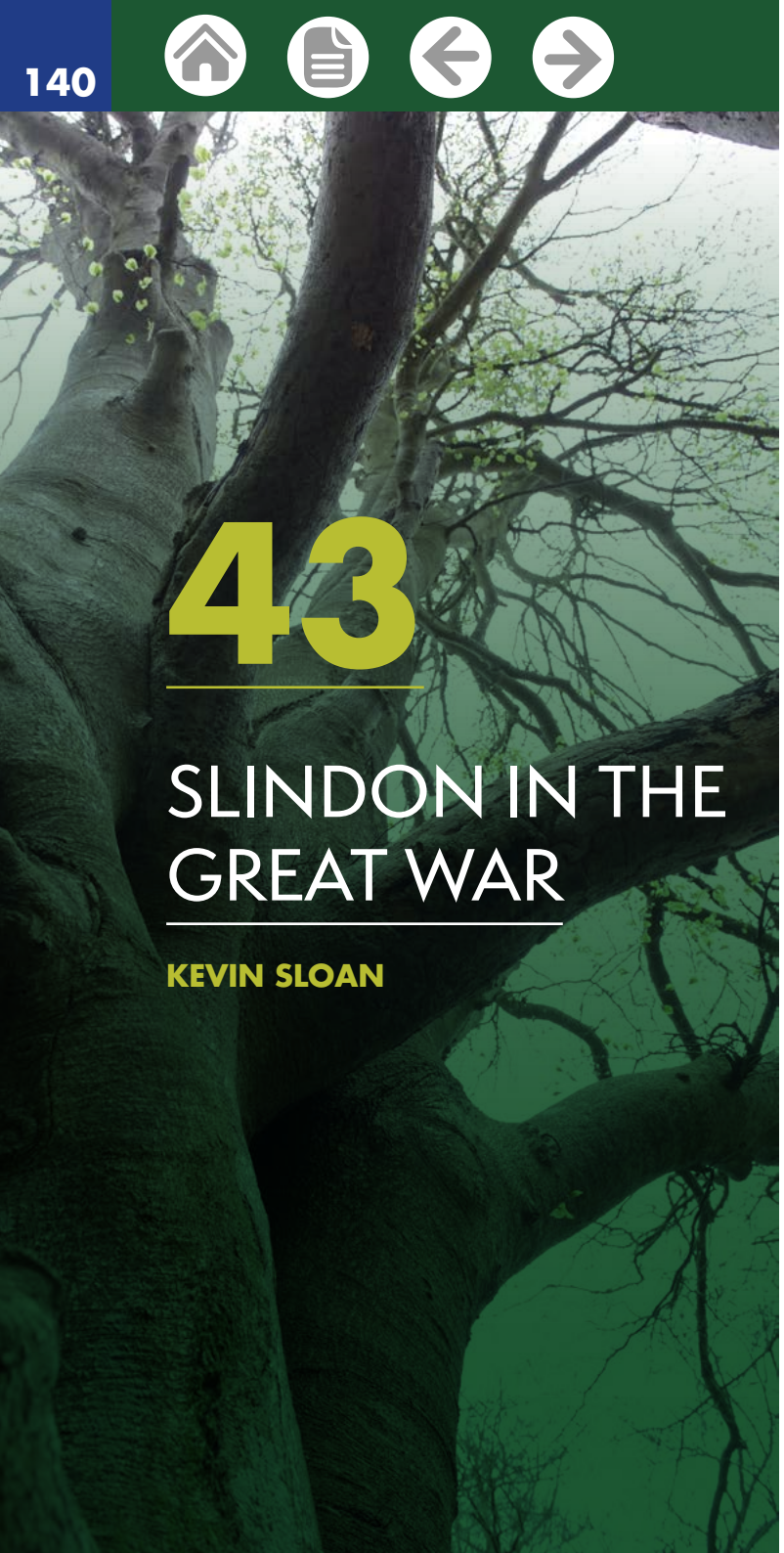
The city schools were closed for municipal elections and periodic events such as the Sloe Fair. There are also several references to children being absent for hop picking and May poling. Although parents risked heavy fines if their children didn't attend school, one mother wrote: 'She would send him when she liked but not while he could earn 6d.'

Schools received funding from government based on their attendance figures, so registers were carefully completed and checked. However, it was noted that 'The police do not collect the fines so parents do not fear being summoned.' Which all goes to prove that even the past occasionally can be a bit familiar. Sometimes nothing changes, does it?



A grainy but evocative picture reproduced from a newspaper image of the Victorian school at West Dean.

All present and correct – West Dean schoolchildren in 1924.



43

SLINDON IN THE GREAT WAR

KEVIN SLOAN

I WAS LUCKY ENOUGH TO HEAR OF THE SECRETS OF THE HIGH WOODS PROJECT EARLY IN 2014, when I was studying for an MSc in landscape archaeology. I had a specific reason for wishing to get involved, which was that, like many students before me, I was in a dilemma about deciding on the research topic for my dissertation.

I wanted to combine my interests in landscape archaeology and 20th-century military history, and High Woods offered me the opportunity to use LiDAR data as one type of source to complement my research into the WWI camps at Slindon, which lies in the South Downs about seven miles north of Chichester. The National Trust now own the estate and, as in 1914, much of it is woodland.

In 1917 the war had had little lasting effect on the countryside within the Slindon Estate, which was about 800 acres (approximately 325 hectares) in size. Its woodland was mainly beech, with a little oak. However, by 1919 the landscape was to undergo a dramatic change, with the clear felling of Slindon's Eartham and North Woods by soldiers from the Canadian Forestry Corps and German prisoners of war.

Slindon offered me an opportunity to use high-resolution LiDAR data to look for evidence of the changes in the landscape caused by the soldiers' camps and the communications routes specifically constructed to serve them. These consisted of roads, 6.5 miles of light railway laid to extract timber back to a sawmill, and an aerial ropeway which ran for several miles across the downs from Eartham Wood to Mid-Lavant via the Goodwood Estate. It was built to carry slab wood to a factory making acetate, a constituent in the manufacture of explosives. Other uses the timber was put to included trench supports – during the war – and firewood after the Armistice in November 1918.

> On the aerial photographs from 1971 you see an outline which turned out to be an underground bunker to drop the airships into … and also they put a railway line up into the woodland … and they had three anchoring stations up in the woods. Now all three anchors are still in situ. I don't know where two of them are … . They ploughed one up in 1952 – thirty yards of anchor chain; ship's anchor chain. It took them three days to bury it.
>
> Robin Upton

The location of the German camp was already known, but it seemed that the site of the Canadian camp was less certain. In other archaeological projects LiDAR has helped identify the locations of individual huts and the layout of camps and roadways, and I was naturally hopeful of being able to do the same.

Archival research at the West Sussex Record Office and online Canadian national archives produced detailed accounts of

the numbers and types of building in each camp, including their dimensions and construction materials. In addition to the sawmill, the largest of its type in England, the Canadian camp consisted of eight huts, both a soldiers' and an officer, dining room, an officer, mess and an orderly Room. There were also quartermasters' stores, stables, a blacksmith's forge and a six-bed hospital. Cement floors had been laid in the bathhouse and the latrines. Water was piped in and a constant supply of hot water was installed. For relaxation the Canadians had a YMCA welfare hut and an Army and Navy canteen.

> There was a camp for 200 prisoners of war set up very close to the Canadian lumbercamp … . Basically they just worked with the Canadians in the camp itself. They were involved in the felling of the timber as well. From what I gather most of them were perfectly happy to do this, although it's a bit ironic that they were actually helping to make pit props for the British trenches. But we have to understand that the war and the trenches were so bad that I think it doesn't matter if you were German or British, I think you were quite glad to be out of the trenches and a prisoner of war.
>
> Rodney Gunner

The prisoner of war camp, by 1919, consisted of at least nineteen huts for the prisoners and their guards, including a cookhouse, a dining room, a bathhouse and latrines, and an electricity generator hut. The size of each hut had been recorded in a sales catalogue of the camp. The owner of the estate was a keen photographer, and photographs of both the Canadian and

Historic photograph of the sawmill at the Canadian Forestry camp on the Slindon Estate during WWI. Note the date of November 1914 bottom-right.

German camps survive in the Slindon History Group archives as well as in the National Trust's archives. Using the photographs and known dimensions, it was possible to work out the camp's frontage.

> A lot of the men, unfortunately, towards the end of the WWI at Slindon, later contracted the 'flu epidemic and a lot of the men actually died, and they were buried at Seaford Cemetery, which is the local cemetery in Sussex for Canadians – WWI and WWII.
> Rodney Gunner

I made repeated visits to Slindon to carry out field research over several months so that I could see the area under different vegetation. After the archival research I knew that a large industrial complex that had processed thousands of tons of wood had been in existence for at least two years and several hundred soldiers had lived and worked in a fairly small area. I regularly consulted the LiDAR imagery and manipulated the data to create different visualisations, each of which emphasised different aspects, in an attempt to find evidence of the camps and their roads and railway. Archaeological evidence, at least for the water supply to the camps, has survived in places.

Unfortunately there is almost no evidence visible in the LiDAR data, with the exception of a polygon shape with a right angle in the likely area of the Canadian camp and deformed concrete bases in the area of the POW camp, which is also visible on the ground. It seems likely that the land management of the woodland in my study area has been such that all or most physical evidence for the WWI Canadian and POW camps in the estate has been destroyed – or,

Historic photograph of the German prisoner of war camp on the Slindon Estate during WWI. Taken 21 May 1919, some six months after the end of the Great War.

if not destroyed, then slighted to such an extent that if any evidence is visible in the LiDAR data I have not be able to interpret it. It was a considerable disappointment for me not to have found in the LiDAR data any new evidence of the Canadian and POW camps.

However, the LiDAR data did show up an interesting set of anomalies in my study area not connected with either camp. In April 1918 approximately 81 hectares of the estate were taken over for the site of a Royal Naval Air Service Out Station for anti-submarine balloons subordinated to the larger RNAS base at Polegate on the south coast (see Chapter 45). The anomalies visible in LiDAR are relatively close to some cottages that are understood to have been associated with the RNAS headquarters in Slindon. There are two concrete bases in this area that I came across when investigating the LiDAR anomalies. Maybe these anomalies are evidence of facilities associated with the balloon station?

Looking back on my dissertation I did discover, of course, something else. And perhaps this is the most important lesson I learnt – that archaeologists don't always find what they are looking for. But they do usually find something!

A LiDAR image of anomalies at the possible Royal Naval Air Service Out Station.

Take a look at how the Slindon sawmill looked during WWII.

44

THE GREAT WAR – SMALL SNIPPETS FROM THE HOME FRONT

KATE DORKINS

THIS WAS MY TASK. Go and look at local newspapers and see if you can find anything in them that might refer to military activity in the Secrets of the High Woods area during the Great War. Ok. So I was to be both sleuth and spy. I had never been either before. Exciting.

In some of the newspapers I found articles relating to troop movements in the Goodwood area. One such was described in the *Bognor Observer* (15 July 1914), detailing the 1st Infantry Brigade from Aldershot spending time under canvas in Goodwood Park. Can you recognise tent positions in archaeology? I was doubtful. Not unless they had very big tent pegs. Of course they must have dug latrine pits. Some lucky archaeologists might be able to detect them.

The Brigade consisted of a battalion each of Coldstream Guards, Royal Munster Fusiliers, Black Watch and Scots Guards, together with the 116th and 117th Batteries of the Royal Field Artillery and the 15th Hussars. The Black Watch and Fusiliers were accompanied by brass bands, whereas the Highlanders and Scots Guards had their bagpipes and drums. It must have been quite musical at times. Well, noisy at least.

The total number of men in camp was about 3000. When the weather was unfavourable they returned to camp early. However, when it was sunny the men participated in tactical exercises in the neighbourhood of Lavant and Singleton. Would these exercises involve earth-moving? Did they dig zig-zag defensive trenches common on the Western Front? I thought I was on to something. And my new discovery told me that I was.

According to the *Worthing Gazette* (24 March 1915), the downs were an excellent training ground for the new army. Soldiers were seen marching and manoeuvring, engaging in flag signalling, *and* practising trench digging. Success! A small one perhaps, but success nevertheless. Early trenches were little more than foxholes or ditches intended to provide a measure of protection during short battles. The first major trench lines were completed in November 1914. Trenches were dug in a zig-zag pattern so that if an enemy entered the trench he could not fire straight down the line.

To help the war effort, a small workshop at West Dean was set up. The workshop was to take advantage of the existing electrical and other machinery at the West Dean House to manufacture small shell cases, as recorded by the *West Sussex Gazette* (2 December 1915). Perhaps elements of that could have survived? It was a long shot.

Another article in the *Littlehampton Observer* (7 July 1915) detailed a 'Sussex Volunteers' Field Day'. During the exercises dispatch riders had to cross areas held by opposing units (Slindon down to the sea) to deliver a message. This involved plenty of semaphore signalling from various points on the downs. I was not an expert on semaphore signalling, but I knew it involved waving two flags about in certain fixed positions to convey messages. It must have been very tiring on the arms. However, I doubted whether it would leave any archaeological trace.

In the *Chichester Observer* (4 October 1916) there is mention of the descent of two balloons – one in Chichester and the other near East Dean village. They were manned by the Royal Flying Corps and the journey from London had been made for test purposes. An aeroplane had also come down in Yarbrook, Lavant, the pilot encountering a misty atmosphere. Now an aeroplane could leave some archaeological record, I knew that for a fact. But it depended on the severity of the crash. Some aircraft came down so heavily that they buried themselves, and their poor pilots, in their own crater.

The *Worthing Gazette* (2 May 1917) noted that the Sussex woodlands were being used to repair the damages of war. The county's trees were being felled to provide trench props, railway sleepers and other elements of construction work. Now this could leave some trace on the ground for our enthusiastic ground-truthing volunteers to find. An expert in forestry could tell us what buildings and equipment might have been required. I imagine quite a lot. All that sawing, cutting, splitting, stripping and hauling must have left some traces, surely? If my hunch proved correct we might recognise their vestiges on the ground through LiDAR.

Archaeology and local historical research is a bit like detective work. You search and search, amassing details, finding a few little clues that might lead to something bigger. It's painstaking work. My successful snippets were certainly on the small side. But maybe, when put alongside other bits of information, such as the LiDAR imagery and other documentary sources from the archives, a clearer and bigger picture of a place in time might be revealed. Like I said. Exciting.

R AND WEST SUSSEX RECORDER. WEDNESDAY. AUGUST 12. 1914.

Photo by Donald Massey.

Commandeering Horses at Bognor for the War.

NOTES AND COMMENTS.

NO MORE PANIC, PLEASE!

The panic of the first week of war is over, and

THE WAR.

Continued from Page 3.

RELIEF FUND QUESTION AT

The Countess of March is t
the Association for West S
Treasurer and Hon. Secretary
of Ruahine, Hambrook. The
the Divisions are: —
Arundel—Mrs. C. Fletcher, D
del.
Bognor—The Viscountess E
Lodge, Bognor.
Chichester—Mrs. Weller-Pole
Chichester.
Horsham—Mr. Clifton Bro
Faygate, Horsham.
Midhurst—Mrs. Anthony Hol
ing, Fernhurst, Midhurst.
Petworth—Mrs. Osborn Ba
House, Billingshurst.
Steyning—Hon. Mrs. For
Morleys, Henfield, Sussex.
Worthing—Mrs. C. W. Pa
Liverpool Gardens, Worthing.

Over 100 Aliens Registered in

Upwards of 100 aliens had co
order by registering their name
with the police at Chichester y
day), and additional names wer
every hour.

The Red Cross Society.

The Chichester Division of
Society, of which Miss Hannah
ant, has been actively engaged
week in making preparations fo
the call may come.
The Chichester Aid Society,
in conjunction with the Red
already doing a most useful
supervision of the Mayoress
as Hon. Secretary.
All materials for Red Cross
ages, etc., can be obtained fro
at "Ivy Bank," St. John's S
articles are to be sent to Mrs.

A local newspaper records the commandeering of horses in Bognor at the outbreak of WWI.

THE OBSERVER AND WEST SUSSEX RECORDER. WEDNES

ROADS DAMAGED BY MILITARY TRAFFIC

SCHOLASTIC.

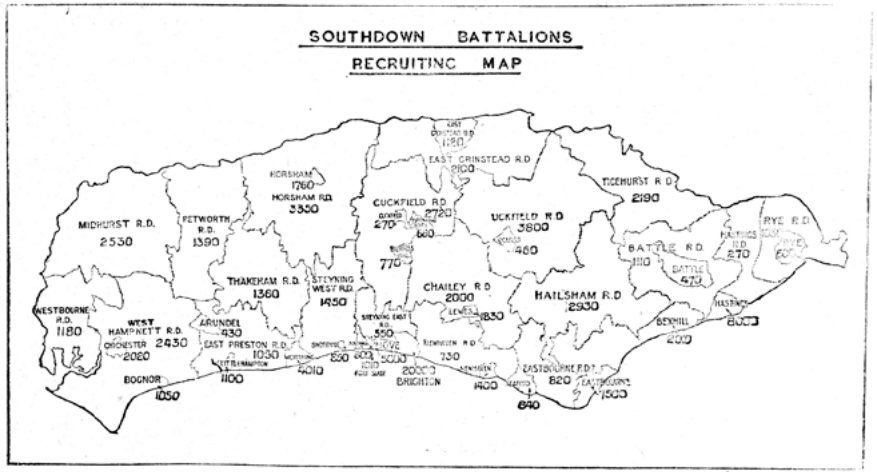
GINALD W. SWANSBOROUGH,
IST AND CHOIRMASTER OF
T. WILFRID'S BOGNOR.

tin of apricots, tin of salmon, pot of raspberry jam (which cost 1½ francs), a large cake, several bars of chocolate, and tea.

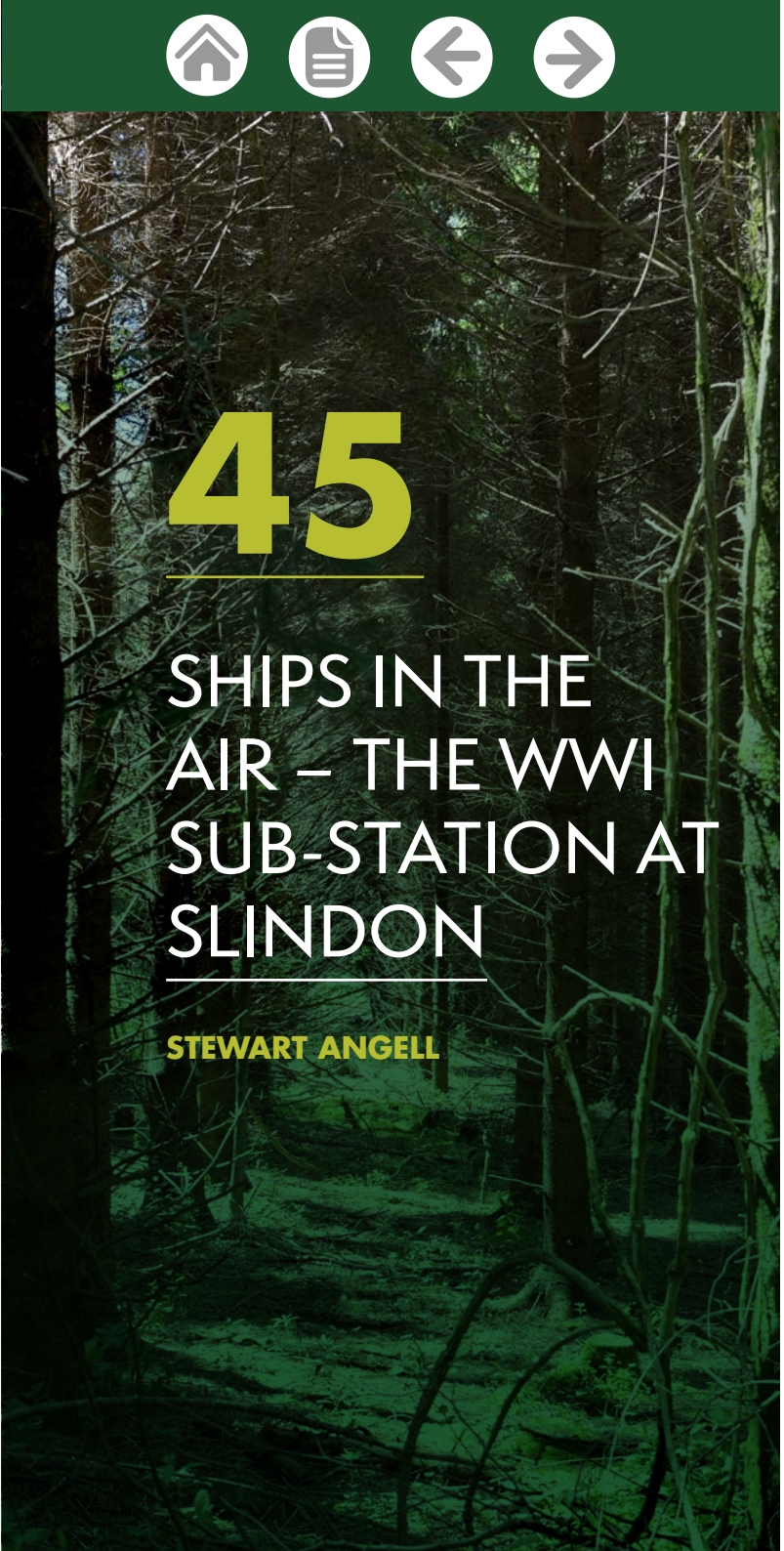
Last night there was some very violent fighting in the trenches, and we could see the flash of the big guns through the dark night.

miles out of the danger zone, and t
early back they came, looking the
bad night and a little silly at their
The Germans didn't appear to sti
tion. Their heavy guns were going
from early in the evening till early t

A local newspaper records the number of roads damaged by military vehicles in 1915.



A recruiting map of Sussex at the outbreak of WWI showing how many men, aged between 19 and 39, were resident in the various regions and towns of the county.



45

SHIPS IN THE AIR – THE WWI SUB-STATION AT SLINDON

STEWART ANGELL

BY THE END OF 1917 Germany's unrestricted submarine warfare around the British Isles was having a devastating effect on allied shipping. But airships were realising their worth as a defensive weapon against the enemy submarines. Airships had the ability to fly slow at a low altitude or remain stationary, and had a greater flying range than equivalent aircraft; as such, they forced submarines to submerge, making navigation difficult and reducing their ability to attack.

In early 1918 the decision was taken to extend the scope of Polegate Airship Station in East Sussex by establishing its field of operations westwards. This was to take the form of two sub-stations. The sites required suitably wooded areas to protect the airships from high winds when moored in place on the ground. Two such locations were found: one at Slindon, near Arundel, and the other at Upton in Dorset, at the head of Poole Harbour.

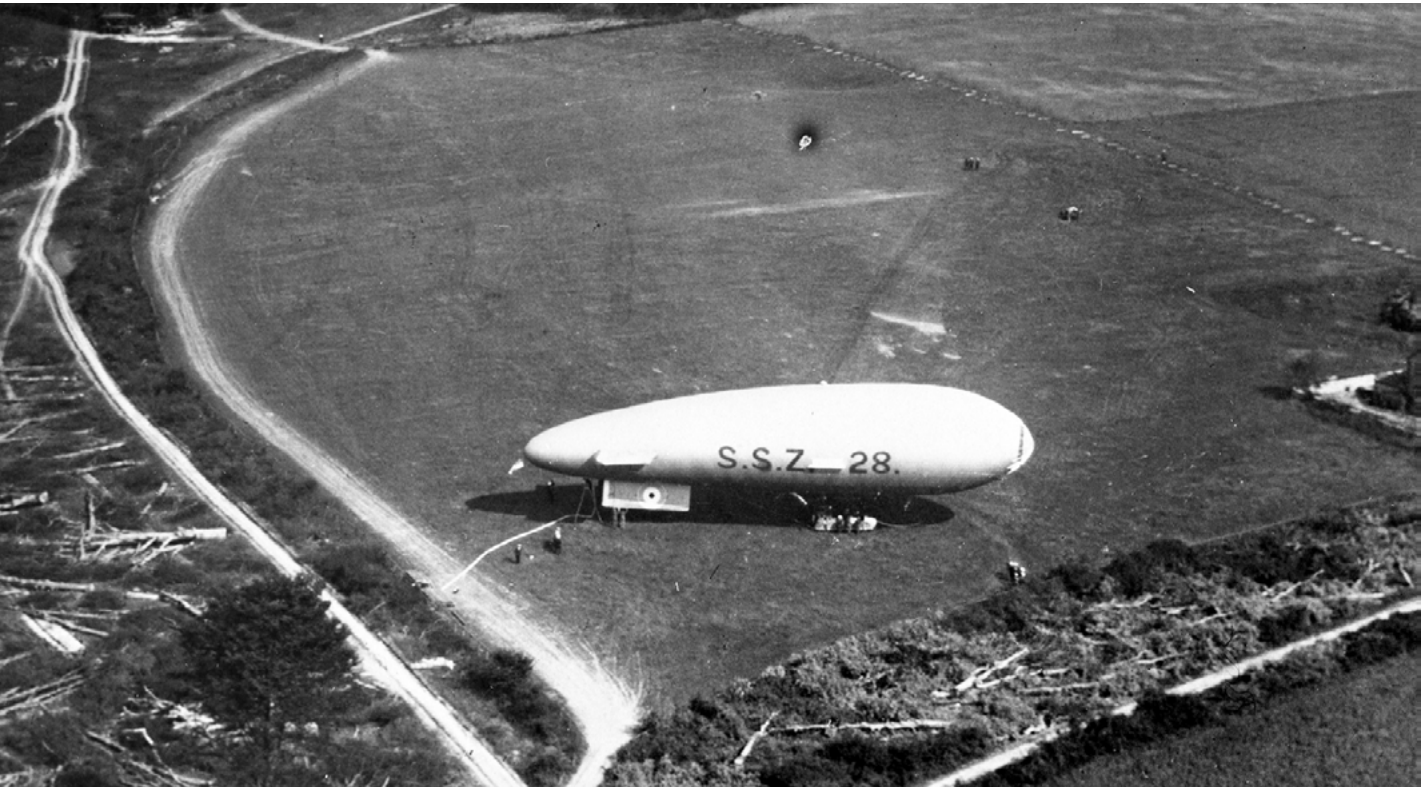
In March 1918 work commenced on clearing and preparing the sites to accommodate both the ships and essential personnel. At Slindon this would have undoubtedly been undertaken by the Canadian Forestry Corps (114 Company), already established within Eartham Wood.

The increased level of activity involved in establishing the sub-station must have aroused a lot of interest in the usually quiet surrounding rural setting. When Slindon gained its commission on 28 April 1918 locals were suddenly surprised by the sight of airships flying overhead. Their landing and taking off would soon become a common occurrence. Initially two airships could be moored at any one time; very quickly this extended to three.

Anti-submarine patrols were carried out by airships of the Sea Scout Zero class. Powered by a reliable Rolls Royce 75hp Hawk engine, they measured 143 feet long and 44 feet high (that's the same length as three double-decker buses parked directly behind each other and as high as three buses on top of each other, wheel to roof). To operate this class of airship required a pilot, an air mechanic and a wireless mechanic. However, many more personnel were needed to get an airship prepared and in a position to undergo the rigours of a long-distance flight.

In relation to the main airship station at Polegate, there's no doubt that the Slindon sub-station had a different look and feel for the men transferred there. No large hangars to protect the outer envelopes meant the airships were exposed to more environmental wear and tear, and accommodation for the men became a tented camp rather than the usual wooden huts with bunks. Imagine when the reality of your transfer is brought home to you in such cold discomfort!

Without a hydrogen gas production plant on site, the essential 'lighter than air' gas for airships would have been delivered from Polegate in long, narrow high-pressure cylinders, each containing around 400 cubic feet of gas; a truck-load consisted of thirty such cylinders. These would require loading and unloading by hand, then storing appropriately. It is a common misconception that an airship is totally full of just hydrogen gas, but this



An airship or blimp above Slindon. There are several alternative theories for the origin of the word 'blimp' – meaning a non-rigid airship without an internal structural framework or a keel.

would make for a very light craft that would be difficult to control. A percentage of air was also added to the envelope to maintain its shape and form. On the ground a portable compressor was used to supply air as and when required. Whilst in flight the draught caused behind the propeller could be used as a blower to introduce air.

From the start Slindon played a major role supporting the aerial patrols over the English Channel. To counter the increase in submarine activity a programme was developed to provide continuous patrols, day and night, in all weathers. This must have placed added pressure on the already busy team. It's known that night-time landing was not always planned, with men being roused from sleep by a whistle. Between May and November 1918 over 1000 hours of night patrolling took place from the stations at Polegate, Slindon and Upton. One continuous patrol from Slindon in airship SSZ 28 lasted for a record 26 hours 30 minutes. This was achieved by the crew of pilot Lieutenant E. J. Protheroe, air mechanic J. R. Innell and wireless mechanic H. Bailey.

It appears that the sub-stations were used as a type of 'pit stop' or 'service station' for airships, reacting to the maintenance demands of each arrival. For anything requiring more in-depth work, the airships would have returned to Polegate to benefit from the protection of a hangar and well-equipped workshops.

When you walk the woods around Slindon today it is hard to believe there was ever a busy airship station in the area. The LiDAR

survey revealed little evidence of the former sub-station at Slindon, perhaps because of its ephemeral set-up and limited period of existence. Did the station have any wooden buildings? A small area suggests a row of hut platforms and sits alongside a main trackway just south of a brick-built incinerator. Whilst the incinerator is attributed to the known prisoner of war camp in the woods further north it bears a striking resemblance to one seen in position at Polegate!

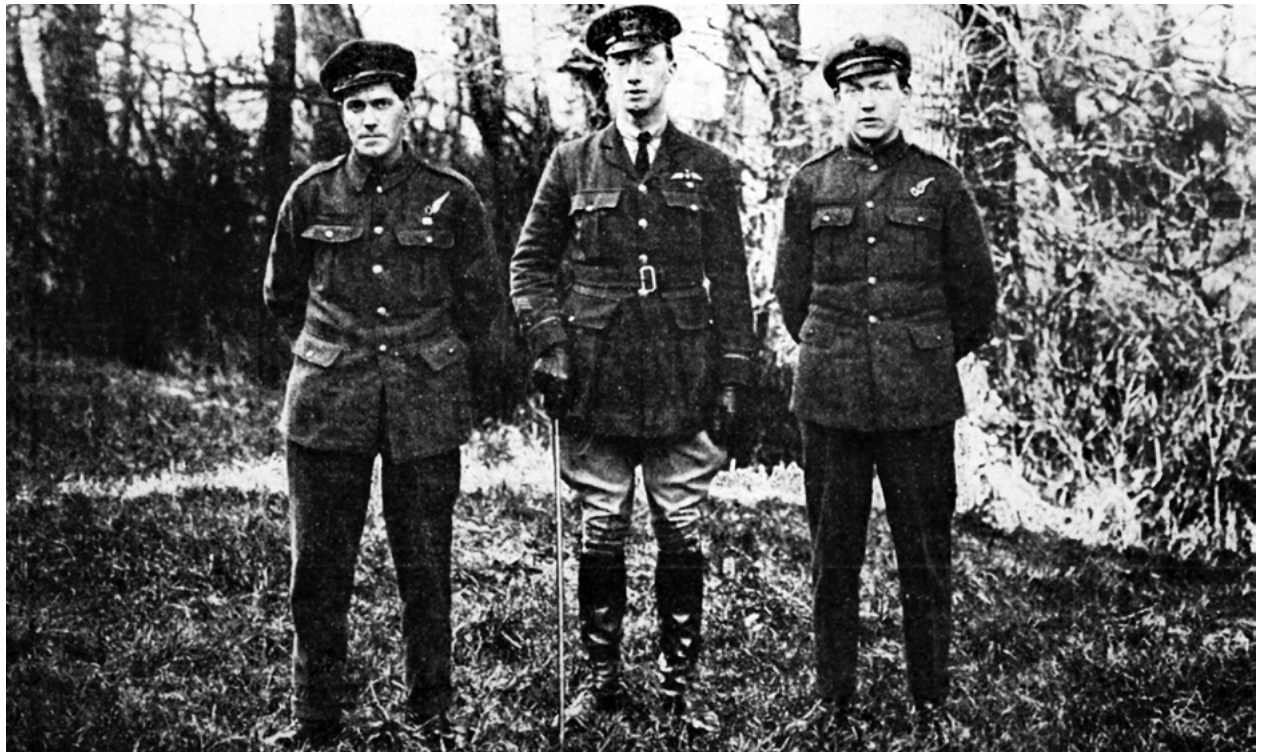
A feature expected, but not found, was concrete mooring blocks to tether the airships down. Perhaps the sub-stations considered the effort of constructing these and adopted a more flexible approach using iron rings set in heavy concrete balls, consistent with other remote sub-stations.

Despite its very basic amenities every effort was taken to make the experience more enjoyable for the men by providing sport. A general sports committee was formed, managing to hold cricket, tennis and boxing matches within the station grounds. Another initiative came in the form of evening al fresco concerts in which local professional artists entertained the station.

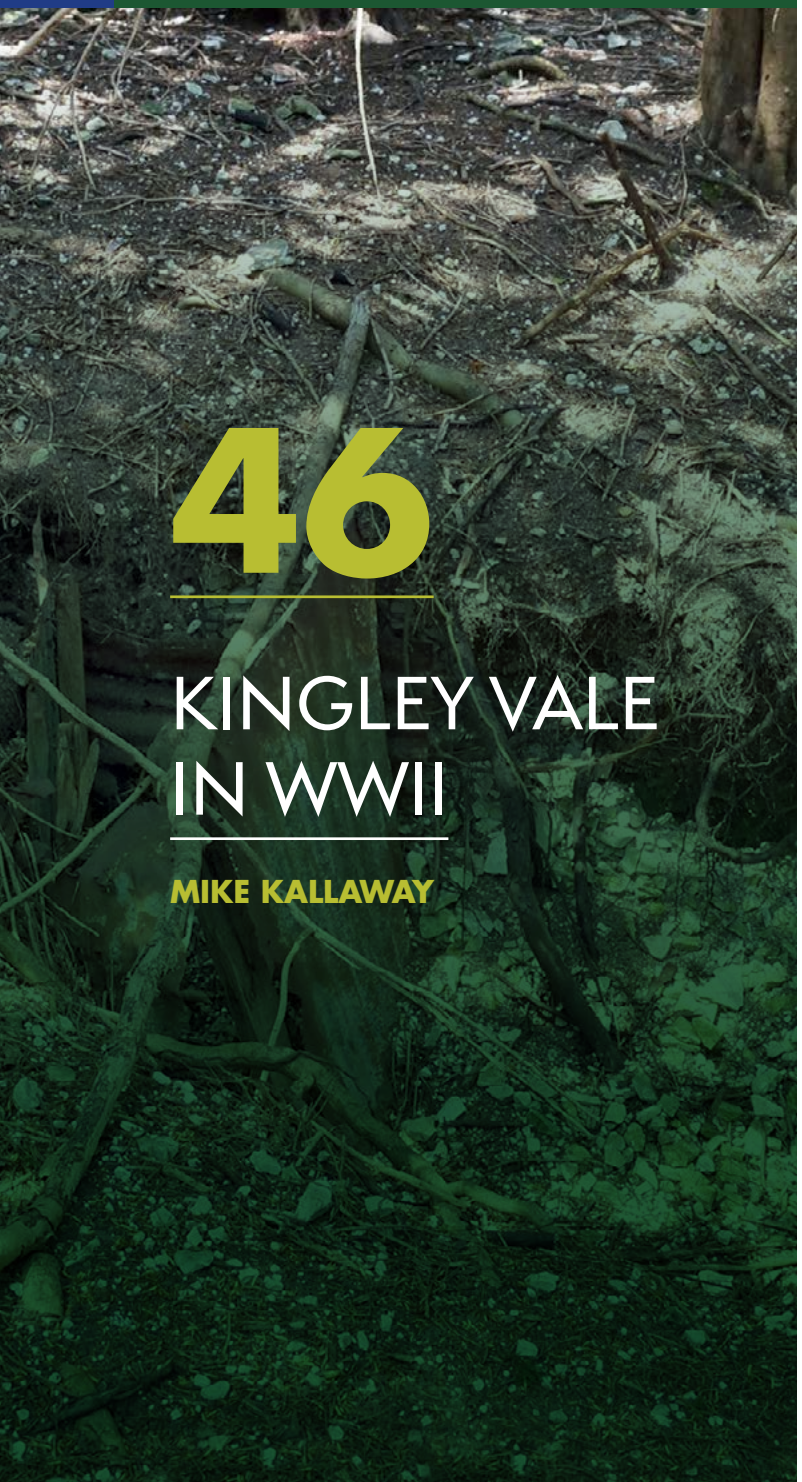
On 21 October 1918 Germany ceased its unrestricted submarine warfare. The airships and their crews had done their jobs. A quote from a souvenir of Polegate Airship Station states:

> Let us not forget the magnificent spirit displayed by the Officers, NCOs and men at Upton and Slindon, who, up to the bitter end in mid-December, lived lives of the greatest discomfort under sodden canvas and oozing mud with a cheerfulness to be admired.

Armistice Day, 11 November 1918, brought the war to an end and the sub-station at Slindon began to wind down operations, being dismantled in early 1919. The men who had crewed these vessels in the sky returned to their homes; their camp and its fixtures were erased from the landscape; and the children of the High Woods no longer turned their eyes skywards to wonder at those ships, suspended and serene, in the air.



The record-breaking crew from the SSZ 28. They were pilot Lieutenant E. J. Protheroe, air mechanic J. R. Innell and wireless mechanic H. Bailey.



46

KINGLEY VALE IN WWII

MIKE KALLAWAY

KINGLEY VALE – a National Nature Reserve designated in 1952 – is popular with walkers. It is well known for its ancient yew forest and prominent Bronze Age barrows. Much less well known is that it was used as a military training ground during WWII.

The shape of the landscape, with the Vale largely enclosed by the surrounding hills, makes it ideal as a self-contained military training area. In the late 1800s it was used as a rifle range, with the targets set up around 300 metres down the slope from the top. The map shows firing positions up to 800 yards from the targets. At that time Kingley Vale was owned by the duke of Richmond and was leased by the military.

During WWII Canadian and British troops charged with the defence of the Sussex coast were based all along the South Downs. In the event of invasion Kingley Vale was one of the locations for the 'British Resistance Movement', often referred to as 'Home Guard Auxiliary Units'. Formed in 1940, these units were intended to harass the invaders and gather intelligence. The West Stoke Patrol was based at the Vale with their main hideout near the bottom of the valley, linked by telephone to an observation post midway up the western ridge. Today the observation post is under trees, but aerial photographs from the period show that the site was once much more open, affording clear views.

Kingley Vale was never used as a base where troops were stationed; its main role was as an infantry training ground. Troops came to the site for short periods. This makes it harder to put together a clear picture of what happened. No permanent buildings were constructed and troops probably slept in tents or huts – all now gone. Canadian soldiers based nearby at Horndean and also probably Rowlands Castle trained in the Vale. Training records refer to such courses as 'Bullets and Bayonets' and 'training with mortars and Bren Guns'.

> They would fire up the valley and what they used to try and do was to knock out individual yew trees as a practice marker point, and they'd go on until they'd taken it out.
> Richard Williamson

Training with live rounds and mortars is inherently dangerous and one member of the Home Guard was killed by a stray bullet during training in 1942. Richard Williamson, the Nature Warden for Kingley Vale for thirty years from the early 1960s, remembers Fred Longman, a local bailiff, talking of removing the bodies of nine Canadians killed during training. Training in the Vale probably reached its peak in the months running up to D-Day from late 1943. That is when the greatest number of troops were stationed nearby.

Despite the potential hazards, and extraordinarily in hindsight, the Vale was never totally sealed off. Ben Dunk, a local schoolboy, recalls cycling over to the site. Finding an unexploded mortar bomb, he tried to prise off the fin with a knife. Not a good idea! But

luckily for him the knife slipped, stabbing him in the hand and probably saving his life.

> Everywhere there were slit trenches, which the Canadians had dug as practice during the run up to D-Day, cos there were said to be 2000 Canadians in Kingley Vale under the trees undercover, and … when we had a bomb clearance eventually, in 1990, we found scores and scores of pilchard tins which they'd buried about a foot deep, and the bomb disposal found all these and dug them up, and they were still bright silver, cos they were really good quality tins that the Canadians had made.
>
> Richard Williamson

After the war Kingley Vale returned to private ownership, becoming a National Nature Reserve in 1952. The site had been cleared of its most obvious wartime relics but as time went on the hazards that remained caused increasing concern. Richard Williamson recollects Fred Longman talking about ploughing up live mortar rounds in the large field to the east of the main entrance.

As more people visited the Vale it became clear that there were still many unexploded munitions on the site. In 1956 a newspaper article headlined 'Death Lurks in this Lovely Vale' demanded that the War Office do something about it. Action to clear the site was undertaken during 1957–8. One issue faced was identifying where the mortars had been fired from; wartime records were poor and did not really help. The assumption was made that the mortars were fired from the valley up towards the top. Accordingly an area about 600 metres wide, extending 300 metres down the valley, was cleared.

Unexploded munitions, however, continued to be found and in 1966 a bomb disposal unit made a selective search of part of the valley. A letter from the Ministry of Defence stated that 'it is now fairly certain that the earlier idea that missiles were fired from the valley into the head of the valley was quite wrong and that the general practice was to

A view down Kingley Vale, near Chichester. It is famous for its ancient yew forest and Bronze Age barrows, but not so well known as a WWII military training ground.

This water tank in Kingley Vale dates from WWII (c.1940) and probably stored drinking water for the Auxiliary Unit, part of the Home Guard.

A tangled twist of iron reveals part of an axle, a wheel hub and associated suspension springs – all that remains of a vehicle from WWII in Kingley Vale.

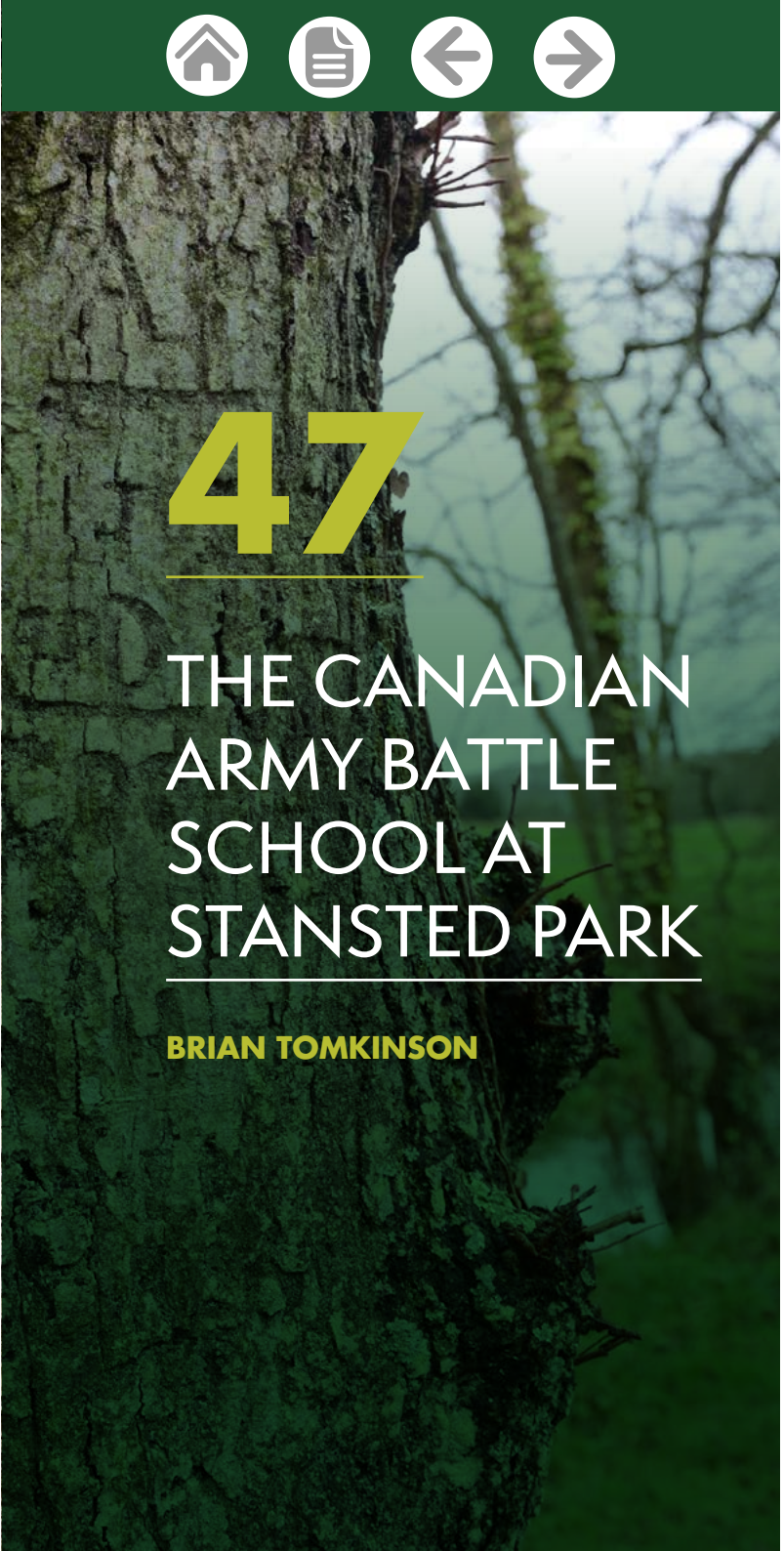
Come and discover the secrets of Kingley Vale using these self-guided walk leaflets.

fire from the British Camp (on the north side) into the valley'.

Surprisingly, given the potential danger, it was not until 1990 that a proper clearance of the site was made. The MoD contacted a number of Nature Reserves as potential training areas for bomb clearance. Richard Williamson, knowing what lurked in Kingley Vale, volunteered the Vale and a comprehensive clearance began. The area chosen stretched from under the top ridge all down the valley. It took many weeks but the search was thorough, using the latest detection equipment, and 6000 bombs of various types were recovered. This is quite remarkable considering that the site had been open to the public for nearly forty years!

Unexploded mortar rounds continue to turn up. In 2013 one was found and destroyed by a controlled explosion recorded on YouTube. Even the ancient yew trees, silent, unscathed witnesses to centuries of history, occasionally bear scars from 20th-century military activity. Thankfully most of them survived.

Most people walking through the Vale today would not be aware of its wartime past. The wonderful yew trees and the line of Bronze Age barrows are much more obvious. There are very few reminders of its use as a training ground in WWII – or its legacy of potential lethal dangers. However, if you know where to look, Kingley Vale will give up its secrets. But be warned – don't look too closely!



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THE CANADIAN ARMY BATTLE SCHOOL AT STANSTED PARK

BRIAN TOMKINSON

I HAVE ENJOYED WALKING IN STANSTED FOREST for many years and have always been intrigued by the wartime features and artefacts that are to be found there. The 'folk' history concerning the war conjured up novel images: 'tanks on the village green' and 'children being given rides in tanks and being given sweets and chocolate by the troops'. These tales made me even more curious. The existence of a Canadian Training School in the village during WWII was news to me and certainly not common knowledge. I really wanted to know more. But how? The Secrets of the High Woods project couldn't have come along at a better time.

As with all good crimes, my involvement with the High Woods project provided the motive, means and opportunity to discover more about this fascinating aspect of local history. The three strands of the High Woods project – Fieldwork based on LiDAR, Archival Research including online biographic sources, and information from Oral History interviews – have enabled me to uncover the story of the School and, in addition, allowed its activities to be accurately located on the ground and mapped.

During the inter-war years the Canadian Army reverted from the highly effective fighting force that it had become during WWI to a series of local militias with a small professional core. Rapid recruitment on the eve of WWII therefore led to a need for training. Many officers underwent training in British Schools alongside British officers and were therefore at the cutting edge of contemporary training methods, such as 'Battle Drill Training'. The catalysts in the Stansted Forest story were the Calgary Highlanders, who had undergone this training in late 1941 and took it up with such enthusiasm that they set up their own School at Bexhill. Apart from their own men, they trained cadres from other regiments and spread the word throughout the Canadian Army with what has been described as 'evangelical fervour'. Their success prompted the Canadian Army Training School to set up the No. 5 (Battle) Wing at Rowlands Castle under Capt. John Campbell, who, together with Lt. Col. J. F. Scott, had founded the Calgary Highlanders' school.

> I remember being down on the swing in the Castle Inn – they had two swings and we used to go down there and play – watching the dog fights in the sky.
> Connie Hayman

The curriculum of the School centred around 'Battle Drill', which was based on lessons learned from the highly successful German stormtrooper tactics of WWI. It reduced military tactics to the bare essentials and required training platoons to react as a team in a formal set-piece manner to specific situations, such as pincer and flanking movements, attacking a defended village and clearing a wood of the enemy. Once the basics had been grasped the students were encouraged to use initiative in the application of their newly learned techniques. The course was very tough and far more

A Canadian national archives picture of Canadian soldiers practising on a rope bridge at the Canadian Army Battle School near Stansted Park.

realistic than existing types of training, in that live ammunition was used during all practical sessions. The nineteen-stage assault course, which the students negotiated under live fire conditions, was considered to be among the hardest in the country.

Surprisingly, the School's War Diaries from its time in Stansted Park give an insight into both the practical and the human side of their activities, containing all the ingredients of a good novel: the pathos of injuries, some rather dry humour and an element of romance. Given the type of training, injuries were inevitable, but were less frequent than expected. One classic example, which also illustrates the character of the CO, occurred on the fourth day of training, when one of the officer students managed to injure Captain Campbell with a mishandled grenade. What the Captain said to the unfortunate student thankfully was not recorded. Promptly enough, the Captain was whisked off to Bramshott Hospital, near Haslemere, where his wounds were dressed, and, 'after scorning an operation, he insisted on returning to duty that night'. Now that's what I call leading by example!

> I can only tell you they were Canadians, and they didn't like His Lordship so they ran all over his flowerbeds … . I think he was Governor General of Canada at some point.
> Michael Sutton

Halfway through their tenure the School also ran a short course for senior officers (from captain up to full colonel), which gave the School's diarist an opportunity for some dry humour (and maybe even relief!):

> Students were taken to Gravel Hill where they were given the opportunity of going through Battle Inoculation. … the majority of those present availed themselves of the opportunity to experience the effect of being under close heavy fire from both machine guns and rifle.

The diarist adds, sardonically or not – 'no casualties were experienced'.

The Canadians developed very good relations with local people. After all, they must have seemed quite an exotic addition to the local neighbourhood. Lord Bessborough regularly invited the School's officers to Sunday lunch at Stansted House. There were also frequent film shows and dances held in the Parish Hall, probably the venue for many happy dates. Oral history given to the High Woods project by two sisters from the village related how 'some Canadian men approached us and asked if we had any sisters. They were absolutely delighted when we said we had five!' Subsequently two of their elder sisters met and married Canadian soldiers who were at the School. Who knows how many such romances blossomed, or hearts were broken, during those Parish Hall dances?

One key piece of evidence emerging from the War Diaries was the sketch map, which was drawn to plan the camp layout. This,

together with LiDAR imaging and fieldwork, has enabled most of the camp features to be identified and accurately mapped. It was also possible to pinpoint some of the stages in the obstacle assault course through descriptions in the Diaries, and to link them to wartime photos.

As it had predominantly tented accommodation, Stansted was only a temporary summer location, the School saying goodbye to Rowlands Castle in September, when it moved to permanent quarters at Windlesham House School, near Washington. Doubtless some of the local girls were doubly disappointed at the end of summer – as surely were some of the soldiers!

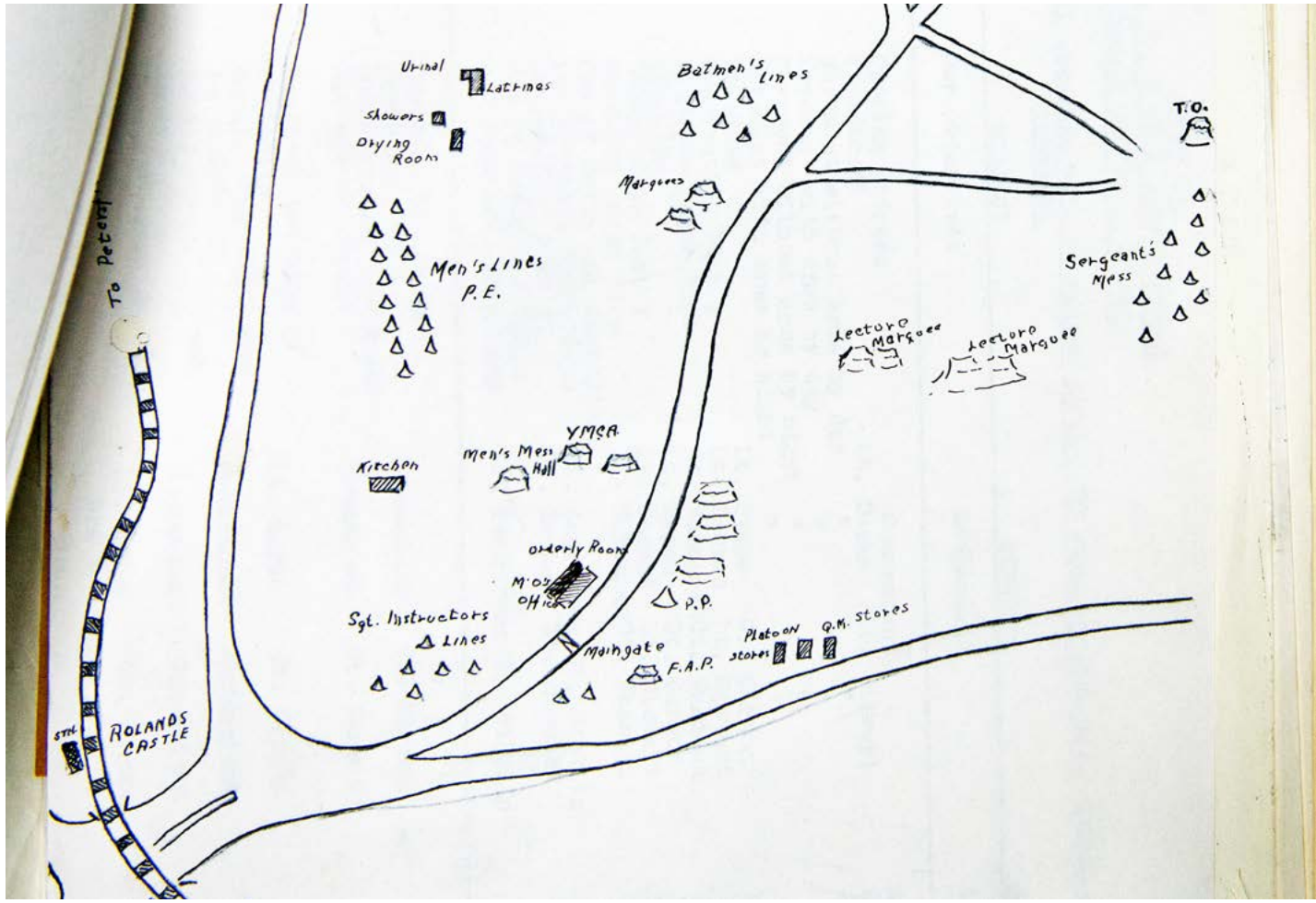
Red Anderson: 'When you went into action, you knew that you would be in good shape and know what to do.'

Robert Bingham: 'We didn't like that kind of tough training, but it was all for the good. When you got into battle, everything felt so simple.'

Major Campbell remained Chief Instructor when the School moved, but he soon saw service in France in 1944, where he was wounded. After recovering, he subsequently returned to active service and, sadly, was killed in 1945 by a sniper in Wyler, on the German border, just three months before the end of the war.

Although controversial, Battle Drill Training gave the Canadian Army's morale a tremendous boost at a time when it was flagging and the men who experienced it were proud to have been through the course. As illustrated by the quotes above, most felt that it had given them the necessary fitness and confidence to meet the difficult and dangerous challenges ahead.

What took place in Stansted Forest all those years ago undoubtedly saved many soldiers' lives. And years later, as I walk along the forest paths past the oddly shaped lumps and bumps, I am reminded of that story. I feel privileged to have been able to retell it.



A contemporary sketch plan of the layout of the camp of the Canadian Army Battle School from the war diaries. The accommodation was in tents.

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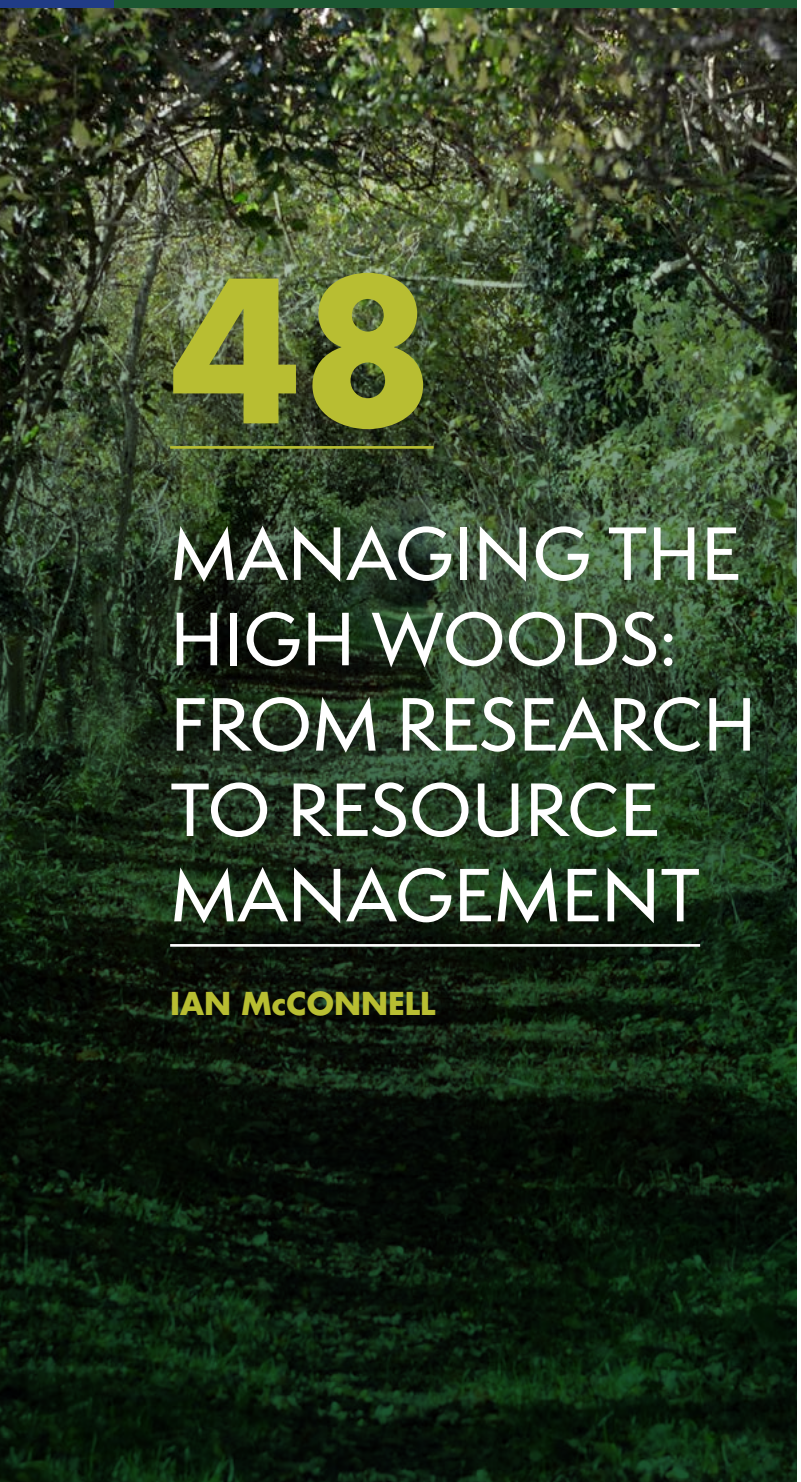
PART 4: CONCLUDING CHAPTERS



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MANAGING THE HIGH WOODS: FROM RESEARCH TO RESOURCE MANAGEMENT

IAN McCONNELL

THE SECRETS OF THE HIGH WOODS

LiDAR data have provided an invaluable framework for academic research and clearly stirred much excitement among archaeological communities, both professional and amateur. Through this work we have come to realise not just that the wooded downs conceal wonderfully preserved above-ground archaeology but also that it exists on a huge and truly landscape scale.

So far, so good – we suspected that this might be the case, and this hunch inspired the project in the first place. The story of the development of the landscape is fascinating, and I love that the project has demonstrated that the 'Wooded Estate Downland', a key landscape character type for the South Downs National Park, was actually once much more open and subject to extensive cultivation in times past.

From the perspective of a National Park ranger, however, the key issue for me has always been about future land management and how this new understanding might be applied to modern commercial forestry operations. It's true, after all, that the reason these woodland earthworks are so well-preserved is because they have been protected from mechanised ploughing. Modern forestry, however, is also a heavily mechanised business, reliant on large, impressive machines both to fell trees and to move the timber to a location where it can be collected by lorry.

The local forestry sector seems to be doing well, driven in particular by the surge in demand for firewood and woodchip for domestic and commercial heating. As a result, woods that are long overdue for a thinning are now back in active management, with clear benefits to the local economy, the future health and quality of our woodlands, and our wildlife. Policy-makers seem keen to back this rural industry too, offering grants for the purchase of forestry machinery to increase productivity within the sector.

> When we first started, the chainsaws were much heavier and slower and all the timber you cut you used to have to handle by yourself – there was no machinery. You'd load it on the tractor and trailer, remove it from the woods and put it in big piles, and then you had to load it on the lorry to go to the mills … . Now everything's more mechanised. You've got machinery to get the wood out, the chainsaw's a lot lighter – much more efficient, faster – so it makes the job much easier.
>
> Ken Austin

So I think there is much to celebrate about the local woodland economy, but what impact might this have on the heritage of these landscapes? There are some risks, I believe, if what we have discovered is not properly shared with forest managers. In my experience, land managers have a strong sense of attachment to or guardianship of the places in which they work. However, if

Historic photograph of logging in the High Woods area, provided by David Laker. Logging in the past was slower and far less likely to damage archaeological earthworks than the heavier machinery used today.

Guidelines for the stewardship of heritage assets in forestry management

Removing timber from the High Woods in 2013. The location is Duncan Hanger, on the Barlavington Estate.

they are unaware of the presence and the value of a feature they are unlikely to take it into account, and can hardly be blamed if something goes wrong.

Inevitably, mishaps do sometimes occur. Timber harvesting and forwarding machines may have large, low-ground-pressure tyres, but they are still very heavy vehicles and I have seen the damage caused when one has unknowingly driven over the top of a Bronze Age burial mound concealed within a dense conifer plantation. Commercial pressures also contribute to the risk of damage – forestry machines are very expensive bits of kit, and can't afford to be sitting idle because of some wet weather. It's not very realistic, then, to expect that timber is hauled out of the woods only when there is no risk of churning up the ground.

Watch Ian McConnell explaing how LiDAR can influence day to day land management in woodlands.

What tools do we have to work with, then? For a start, individual woodland management plans need to meet the UK Forestry Standard to get Forestry Commission sign-off, and must include an assessment of the historic features in and the historic context of a wood. This is very welcome and could provide a stimulus to revise practices with our new awareness of the wooded downs area. There is already published guidance on the operational management of archaeological sites in a woodland context and, although useful for individual sites, there is a need for more bespoke guidance aimed at woodland heritage management across this whole landscape. Pragmatic, workable guidelines that take into account the scale of the resource could also highlight the significance of sites within the wider landscape context.

There may also be a case for some sort of fiscal intervention to offset additional costs incurred in protecting woodland heritage. Farms have long been eligible for financial support through agri-environment schemes to conserve historic features, but this incentive hasn't been offered to the forestry sector. I have often thought this a bit odd. This may reflect the heightened risk to features in farmed, particularly arable, landscapes, but it may also be a reflection of how little we have previously understood the archaeological resources hidden beneath the forest canopy. Who knows – entrepreneurial estates might well use these assets to develop new markets for heritage tourism!

Policy and guidance aside, clearly there is no substitute for constructive dialogue with the managers, agents and contractors who plan and carry out forestry operations in this landscape. This, I feel, should be the next focus of activity for the National Park Authority: working with industry and agency professionals to share and interpret the data, raise awareness and discuss concerns and ideas. Done well, this process can achieve a fitting legacy for the High Woods project – locally owned but nationally recognised expertise in the management of extensive historic wooded landscapes within a confident, secure and sustainable forestry sector. The High Woods project has not only delivered an incredible amount of new information for archaeological and historical research but also provided the stimulus for the development of practical operational procedures that will safeguard that resource for the future.

> We used to have maps for every contract. And it's all marked out on the maps – ancient monuments – so you know exactly where they are and you knew what they were … . We used to have to be careful but I think now they've banned the big machines from going over them, or The Forestry did – the big cutting machines and the big trailers and tractors 'cos they're so heavy they're not supposed to run over the monuments.
>
> Ken Austin

A woodpile in Eartham Woods.

49 DISCUSSION

ANNE BONE

THE DISCOVERIES IN THE PROJECT have been incredibly wide-ranging and varied, and one 'discussion' can't pick out all the highlights – so this is only a personal reflection and, as with LiDAR itself, many other reflections are possible. This particular LiDAR survey has been important in showing the benefits of high-resolution survey, which has revealed evidence in the pasture and arable land as well as under the trees. LiDAR surveys are improving all the time and this survey penetrated even much of the yew forest of Kingley Vale – yew being one of the difficult types of woodland for this technique.

The variety of topographic 'visualisations' resulting from the LiDAR data was wider than in most other English surveys to date and this offered the volunteers a choice. Each visualisation had specific strengths and weaknesses that had to be understood. No matter how good the survey and visualisations, however, fieldwork was still essential. The accounts in this book show how much people have enjoyed the challenges of interpreting LiDAR imagery and been fascinated by their discoveries – even to the extent of naming a barrow they were the first to recognise in the field.

A highlight of the project was undoubtedly the discovery of prehistoric field systems and the great extent of their coverage. As is almost always the case with archaeology, this then poses more questions. How were these fields planned on such a large scale? What crops or livestock were being farmed and where did the people live? Nationally, field systems are a well-known type of monument, but there has been relatively little investigation of them – especially on the South Downs. One of the project's excavations was chosen to investigate a small part of one field system. There is plenty of scope for more research of this kind in the future.

Perhaps even more surprising is the complexity and time-depth of the landscape that was recognised in the survey. Some features could be seen to be earlier than others – field boundaries which were laid around, but not across, barrows, for instance. Other features carried on in use, perhaps owing to their prominence in the landscape, such as cross-ridge dykes from the Bronze Age still being used as boundaries for medieval parishes.

Major changes in the landscape resulted from new ideas in recreation and in society's expectations – the deer parks created for status, recreation and food by Norman lords being a case in point. The nowadays humble rabbit was once a status symbol too. Rabbit farming led to changes we can recognise in place-names as well as the occasional survival of the artificial warrens known as 'pillow mounds'. Whilst the deer parks have now been turned into fields or woodlands, the distant descendants of those farmed rabbits can still be seen as they graze pillow mounds in the early evening sun. People often think of the South Downs as an unchanging landscape. Nothing could be further from the truth in the High Woods. These woods have grown over an open landscape of ancient

field systems, burial sites and, somewhere still to be found, the homes and settlements of their creators.

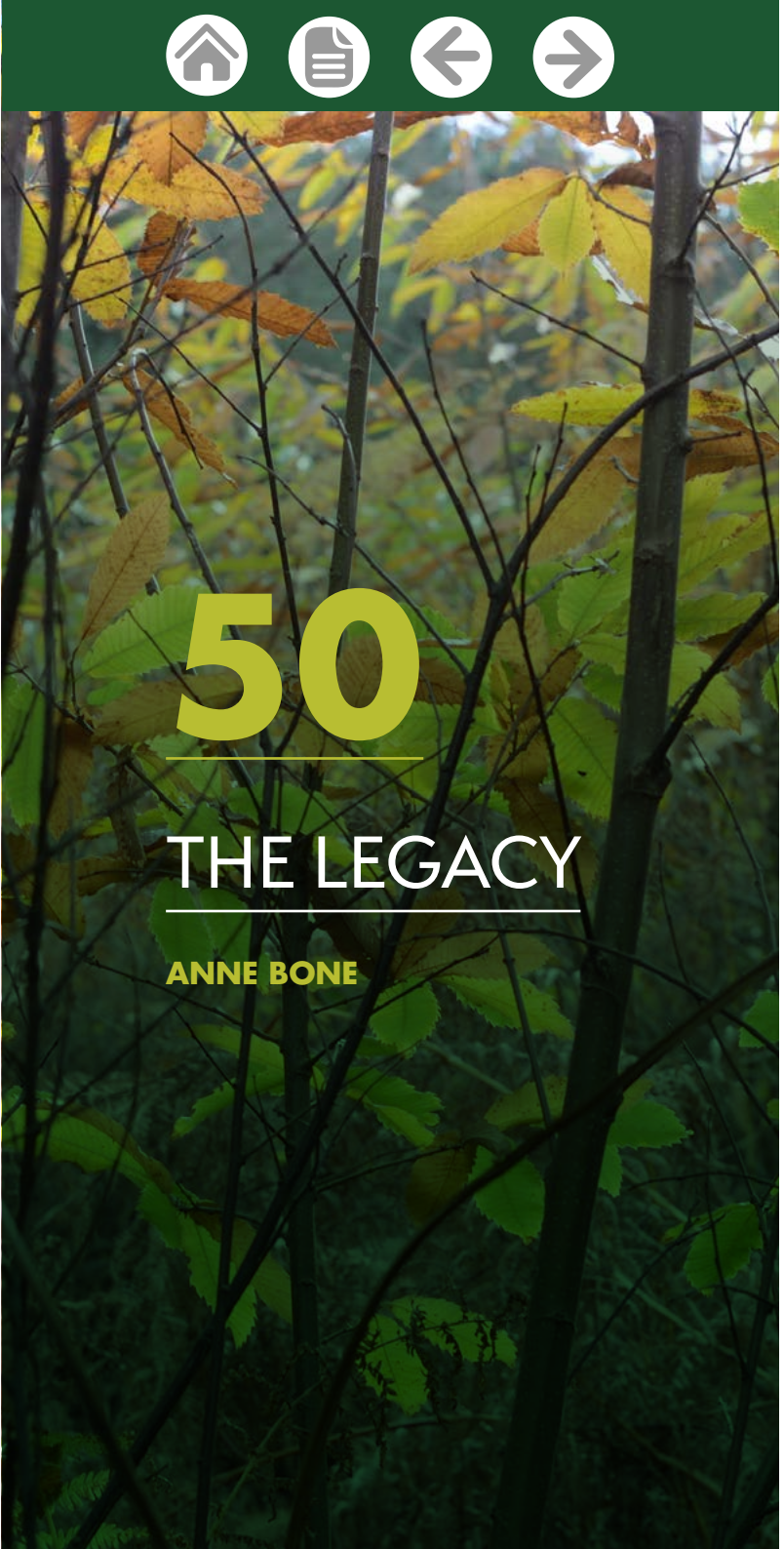
Walking the tranquil woods and fields today, it is hard to imagine them as part of a military landscape – yet the evidence from the LiDAR is sometimes very clear, with traces of WWI and WWII training sites, decoy airfields and bomb craters. On some sites there was surprisingly little evidence left on the ground but oral history, old photos and documents can help us to recreate these more recent militarised scenes. The remains of WWI and WWII also assist us in connecting with major events in world history that had such an impact on local people.

One of the strengths of this project has been the employment of archives and oral history to put people into the picture – and it is people who have made and shaped this landscape over the millennia. The sterling efforts of our volunteers have captured this information. The testimony of people who live and work in the High Woods told us of their lives, their experiences and their feelings. Their deep connection with the landscape was very clear. These very personal stories are much more than nostalgia. The changes in technology in working in the woods were captured for future historians to consider. People and landscape were intertwined in the past – and many of the volunteers have found, or revived, a deeper relationship with their own landscapes through this project.

This book contains many detailed and individual stories about particular places and the hidden pasts brought to light. Volunteers have brought a variety of different sources together to such good effect. The excitement in research lies in the hunt for that elusive clue, hidden in the record office, in the field surveys or in someone's recorded account of their life. Sharing information, too, has been at the heart of the High Woods project. Find the evidence, interpret the landscape and histories and bring it all together to share with other people. And, as a technology-led project, we've embraced the futuristic present (which would have seemed like science fiction only a couple of decades ago) to recount stories through reconstructions created on state-of-the-art gaming platforms and shared these through the Internet. In the end, though, there is no substitute for being out there on the South Downs, letting your eyes and mind wander as freely as they can.

Views over Kingley Vale from Tansley Stone.

View the full Secrets of the High Woods short film here.



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THE LEGACY

ANNE BONE

WHEN WE DEVELOPED THE SECRETS OF THE HIGH WOODS PROJECT we were very keen to address two 'big issues': could we find out more about the archaeology and history of this landscape? And then could we involve more people in doing this? Our passion as heritage people is always to better understand the past so that this knowledge informs the present and the future – and involving more local people and making them equally passionate about their heritage is a great way to do this. At an early stage in planning the project we got to grips with one of those workshop tasks loved by management consultants – write on a postcard what successes for this project will look like in three years' time. Mine said:

> Look how much we can now see without the trees in the way – LiDAR is amazing. Dedicated and newly trained volunteers have walked and checked the discoveries whilst other people are discovering the joys of archives research. People's memories of living and working in the area are helping us understand the changes in the landscape. And we're telling all these stories to lots of other people!

Information about our archaeological legacy has been reviewed in the National Mapping Programme report, which will be available on Historic England's website. We now know that the results are stunning and that the preservation of archaeology under the trees is exceptional. All of this new information, including the volunteers' records of individual sites, has also been transferred to the Historic Environment Records – the definitive databases held by Local Authorities to inform future decisions. Landowners are also being offered the data for their estates to inform their future management of the woodland.

Archaeologists are always finding novel questions to ask as we make new discoveries, interrogate the 'accepted' explanations and bring fresh ways of thinking and innovative techniques to our investigations. LiDAR is one example of these advanced technologies revolutionising our understanding. There are still many questions to ask of our discoveries – and different ways of processing the LiDAR data will give us even more opportunities. And the data are exciting not just for archaeologists – foresters, hydrologists and many others will find ways to investigate our landscapes utilising LiDAR imagery.

The project has supported 'independent' researchers and universities and will carry on doing so. One way of doing this will be giving universities a copy of the LiDAR data so that their students at all levels can carry out research – and share the results with us. We hope the universities will find interesting and alternative ways of using the data too – from digital arts and gaming to working out the carbon captured by the trees.

It was relatively easy to predict the project's archaeological legacy – though we'd no idea just how much we would find. The biggest surprise in the project was undoubtedly the

number and enthusiasm of the volunteers who wanted to be actively involved. The full study of the impact of the volunteers is still underway, but some things are very clear. We've been successful in involving people who weren't already active in heritage – 40 per cent of the 120 volunteers weren't members of a local group before Secrets of the High Woods. It's great to see some of these faces now coming to local archaeological society meetings, getting involved and finding out more. In doing so they will maintain their interest after the current project ends.

Many of the volunteers have also made new friends and enjoyed the outdoor activity, such as ground-truthing. Sometimes they've been keener than project staff to carry on despite wind and rain – so we've had to keep up with them! In some cases signing up to the project and coming out on a regular basis has even given people a new purpose in life and made them happier. Now happiness is good for your health all round – so maybe we've made a difference that is very hard to measure.

For some unknown reason, when we developed the project we expected that the people volunteering for archives research and oral history work would be different to those doing the ground-truthing. However, some people really got the 'Secrets of the High Woods' bug, and have done two if not all three types of activity. All these volunteers have also developed new skills – from reading Tudor handwriting (needs a lot of practice) to knowing how to search for elusive information in a record office. Once you've got an appetite for archival research you'll always want to do more. And there is the opportunity to share that information by publishing on paper or online. Oral history volunteers have recorded people's reminiscences (without butting in), summarised the information and transcribed the most interesting aspects for the project. The recordings will be deposited in the record offices and be available to future researchers (depending on the interviewee's consent form), thus constituting another legacy for future historians.

The volunteers have all become members of the South Downs Volunteer Ranger Service too, and may continue active volunteering through this or through other local groups. There is plenty of additional potential to continue the ground-truthing work, but this needs to be supported by a member of National Park Authority staff with field archaeology experience and the technical skills to use the database and LiDAR visualisations. Archives researchers may want to carry on their researches, or spread their interests into different subjects. Other National Park projects in the future may well wish to invite archives and oral history volunteers to come and join them. And there are plenty of local organisations outwith the South Downs National Park that might support and welcome these volunteers.

The reality of this type of project is that it is funded for a finite time only. Project staff and volunteers move on to greater things with the experience they've gained. We know that we've found a lot of archaeology beneath and between the trees. We've mapped it but we scarcely yet understand its significance. That's going to mean a lot more research projects using our data. That will be a fundamental part of the legacy. The amazing discoveries of the Secrets of the High Woods, which we already have, will remain forever. The challenge for all of us – staff, volunteers and the public – is to ensure that the fullest potential of this resource is maximised in the decades to come. Much has been found, but there's a lot more to find out.

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ORAL HISTORY INTERVIEWEES

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ORAL HISTORY VOLUNTEERS

Kathy Azopardi, Janet Bradley, Elyshia Brooks, Penny Buchan, Katie Draper, Anne de Potier, Julie Flynn, Roger Green, Laura Haffenden, Mary Iden, Elaine Ireland, Doug Jones, Deborah Jordan, Zoé Perry, Mark Seaman, Ruth Stoddart, Sarah Ullman

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The Secrets of the High Woods survey covered a large area of the central downs, much of which is in private ownership. Without the high levels of support we received from landowners and managers, delivery of this project would have been virtually impossible. By working with landowners, we were able to provide project volunteers with privileged access to landscapes which are often not accessible, or accessible only by footpath.

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The author has drawn heavily on the work produced by A. M. and R. M. Tittensor as part of the Chilgrove Valley project in the 1970s and acknowledges their permission to use their map of the rabbit warren. The map is reproduced with the kind permission of A. M. and R. M. Tittensor.

CHAPTER 32

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This report identifies priorities for the next stage of research 2017–22

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USEFUL WEBSITES

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www.westsussex.gov.uk/leisure-recreation-and-community/history-and-heritage/west-sussex-record-office/ – West Sussex Record Office
www3.hants.gov.uk/archives – Hampshire Record Office
www.sussexpast.co.uk – Sussex Archaeological Society
www.cdas.info – Chichester and District Archaeology Society
www.chichesterlocalhistory.org.uk – Chichester Local History Society
www.worthingarch.co.uk – Worthing Archaeological Society
www.lissarchaeologygroup.weebly.com – Liss Archaeology Group
www.sussex.ac.uk/clhlwr/ – Centre for Life History and Life Writing Research
www.historicengland.org.uk – Historic England Archive
www.archaeologydataservice.ac.uk – a resource for UK archaeology
www.envf.port.ac.uk/geo/research/historical/webmap/sussexmap/sussex.html – Old Sussex Mapped

ABBREVIATIONS

3D	three-dimensional
ACA	Arundel Castle Archives
AR	augmented reality
c.	circa (approximately)
CO	commanding officer
DEM	Digital Elevation Model
DSM	Digital Surface Model
DTM	Digital Terrain Model
GIS	Geographical Information System
HLF	Heritage Lottery Fund
LiDAR	Light Detection and Ranging
MoD	Ministry of Defence
NCO	non-commissioned officer
NGR	National Grid Reference
NMR	National Monuments Record
NMP	National Mapping Programme (Historic England)
NNR	National Nature Reserve
POW	prisoner of war
RNAS	Royal Naval Air Service
UCL	University College London
VR	virtual reality
WAS	Worthing Archaeological Society
WSRO	West Sussex Record Office
WWI	World War I
WWII	World War II
YMCA	Young Men's Christian Association

GUIDANCE ON ACCESS WHEN VISITING ARCHAEOLOGICAL SITES AND LANDSCAPES IN THE SOUTH DOWNS NATIONAL PARK

FOLLOW THE COUNTRYSIDE CODE: RESPECT. PROTECT. ENJOY.

When exploring the South Downs there are a few general rules to help you and others have a safe and enjoyable visit. Always leave gates and property as you find them and ensure you keep to paths unless on Open Access Land. Lots of different people share countryside paths so make sure you slow down for horses, walkers and livestock when cycling and don't forget the country 'hello'.

Help protect the beautiful environment you're enjoying by taking your litter home, keeping dogs under effective control, bagging and binning any dog poo and, as beautiful as they are, refraining from picking or damaging wild flowers. Plan ahead and be prepared for your visit by taking a map and supplies, and wearing suitable clothing – and always follow advice or local signs wherever you go.

For more information about the countryside code visit **www.gov.uk/government/publications/the-countryside-code**.

Volunteers walking back from a day's research at Kingley Vale, West Sussex.

EXPLANATORY NOTE ON CHRONOLOGY AND DATES

Please note that dates in this work are often expressed as either, for example, 1500 BC or AD 43. BC traditionally stands for years before the birth of Christ, and AD for years after his birth. A small *c.* in front of a date stands for *circa*, meaning approximately. At other times specific dates are expressed simply as 1536 or 1918.

Expressions such as 16th century or 18th century are also used. 16th century refers to the years AD 1501–1600, and 18th century equates with the years AD 1701–1800, and so on. In the 20th century the dates for World War I (WWI) are 1914–1918, and for World War II (WWII) 1939–1945.

Conventional archaeological and historic period labels are used sparingly in the text. For the sake of clarification the principal ones, relevant to the South Downs National Park and Secrets of the High Woods, are provided here. (The terms Palaeolithic and Mesolithic are added for the sake of completeness – they do not feature in this book.)

PERIOD	APPROXIMATE DATE RANGE
Palaeolithic (Old Stone Age)	450,000 BC to 9000 BC
Mesolithic (Middle Stone Age)	9000 BC to 4000 BC
Neolithic (New Stone Age)	4000 BC to 2500 BC
Bronze Age	2500 BC to 700 BC
Iron Age	700 BC to AD 43
Roman	AD 43 to AD 410
Saxon	AD 410 to AD 1066
Medieval	AD 1066 to AD 1500
Post-medieval/early modern	AD 1500 to AD 1750
Modern	AD 1750 onwards

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All place-names are in West Sussex, unless stated otherwise. Place-names are discussed on pages 81-83 and individual references are not given in the index.

SECRETS OF THE HIGH WOODS

The High Woods of the South Downs stretch approximately from Arundel in the east to near Petersfield in the west. They mask the undulating contours of the chalk downland, but they also hide the traces of people who settled, farmed, worked and enjoyed that land, long before there were so many trees.

This book is a celebration of the Secrets of the High Woods project, which took place between Arundel and Petersfield in the South Downs National Park between 2013 and 2016. Hidden archaeological and historic landscapes were uncovered beneath the trees by a revolutionary aerial survey technique known as LiDAR. Groups of dedicated volunteers searched the archives, interviewed residents and local workers and battled through the understory to track down the elusive and hitherto unknown monuments. This book is as much about those people as it is about what they found. Their enthusiastic stories, supplemented on occasion by their own and other voices, reveal the Secrets of the High Woods for the very first time.

South Downs National Park Authority

Chichester District Council

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