

Discovery, Innovation and Science in the Historic Environment

RESEARCH



Historic England

ISSUE 10 • FIRST WORLD WAR SPECIAL 2018

Welcome...

...to this special issue of the magazine, marking the centenary commemoration of the end of the First World War.

In this issue of *Historic England Research* we present a selection of projects which have shed new light on the effects of the First World War on England and which also highlight how volunteers have contributed to this knowledge.

We reveal how new remote-sensing technology is transforming our knowledge of submarine wrecks that lie off our shores, and we describe how, on land, Lidar technology is being used to rediscover forgotten training areas. Both projects have called on helpers to verify discoveries, with divers visiting wreck sites and volunteers on Cannock Chase surveying the remains of the training camps. Commissioned research has revealed the evidence for the beginnings of cyber warfare, describing the network of wireless stations built around our coast. New research has also found traces of often elaborate training trenches used to familiarise troops with this type of battlefield warfare and even to prepare for assaults. It was a war that consumed men and material on a huge scale and around 6,000 factories directly supplied the munitions for war. In England around 170 of the most important factories, so-called National Factories, were managed by the government. A project set out to find where these were, what they looked like and if they survive. We also review work by the Council for British Archaeology and volunteers to map the effect of the war on the country, and we highlight the efforts to discover, record, and protect memorials to the fallen.

This edition marks the end of the First World War centenary commemorations. But, just as many of the political repercussions of the conflict continue to reverberate around the modern world, so too will research continue to more fully understand the effects of war, both on the fabric of England and on the seabed.

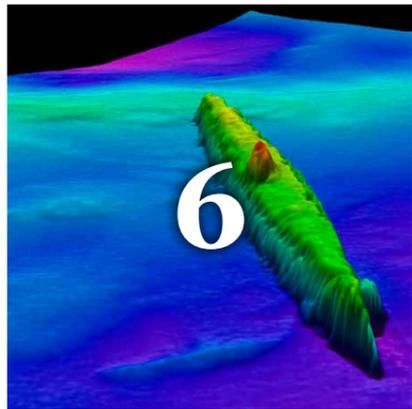
Wayne Cocroft

Front cover image: Schoolchildren undertaking conditions survey at war memorial, Market Street, Ashby De La Zouch, Leicestershire. DP185900 © Historic England, Anna Bridson

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England's **spectacular**
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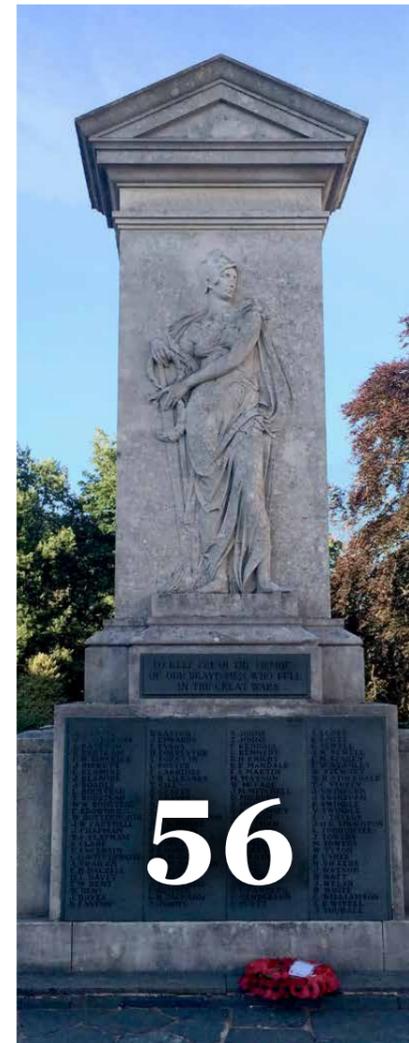
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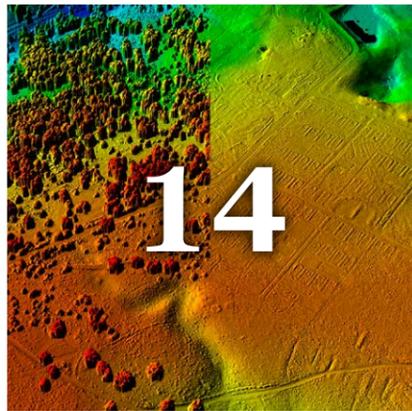
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RESEARCH magazine

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Previous issues of Historic England Research can be viewed online at: <http://bit.ly/HEResearchbackissues>

ISSN: 2058-1858

Product Code: 52109

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The Tower Hill Memorial, Trinity Square, London, commemorating civilian merchant sailors and fishermen who were killed as a result of enemy action and have no known grave. DP182970 © Historic England, Chris Redgrave

Protecting the recent past for the future

Submarine wrecks remind us of the importance of the war beneath the sea during the First World War.



For many people the First World War is largely characterised by the static trenches along the Western Front, with the war at sea being largely forgotten save for the big fleet actions like the Battle of Jutland. But fisherman, merchant sailors, aviators and submariners all played their part alongside their naval compatriots in order that Britain and her allies continued to eat and fight on the Western Front. Historic England has sought to ensure that the war at sea was not neglected during the Centenary period by seeking to remember the sacrifices made by those who fought off our coast.

The war under the sea

Of all the methods of naval warfare it is perhaps submarines that capture public imagination the most: we remain fascinated by the technological ability of these silent and deadly killers. Research commissioned by Historic England showed that 44 German U-boats

were lost in England's coastal waters during the First World War. This number represents just over one fifth of all U-boat losses during the war.

Perhaps unsurprisingly, British submarine losses largely lie further afield, having been lost in operations overseas. Only three are known to have sunk during the war close to our coast: *C29* (accidentally mined in the Humber estuary, August 1915), *D5* (mined off Great Yarmouth, November 1914) and *E6* (mined off Harwich, December 1915).

Assessing the condition of submarine wrecks

While the submarine wrecks were not new discoveries (the locations of many of them are well-known and visited by divers), our work set out to understand for the first time their condition, the extent of their survival and the chemical and physical threats to them. We

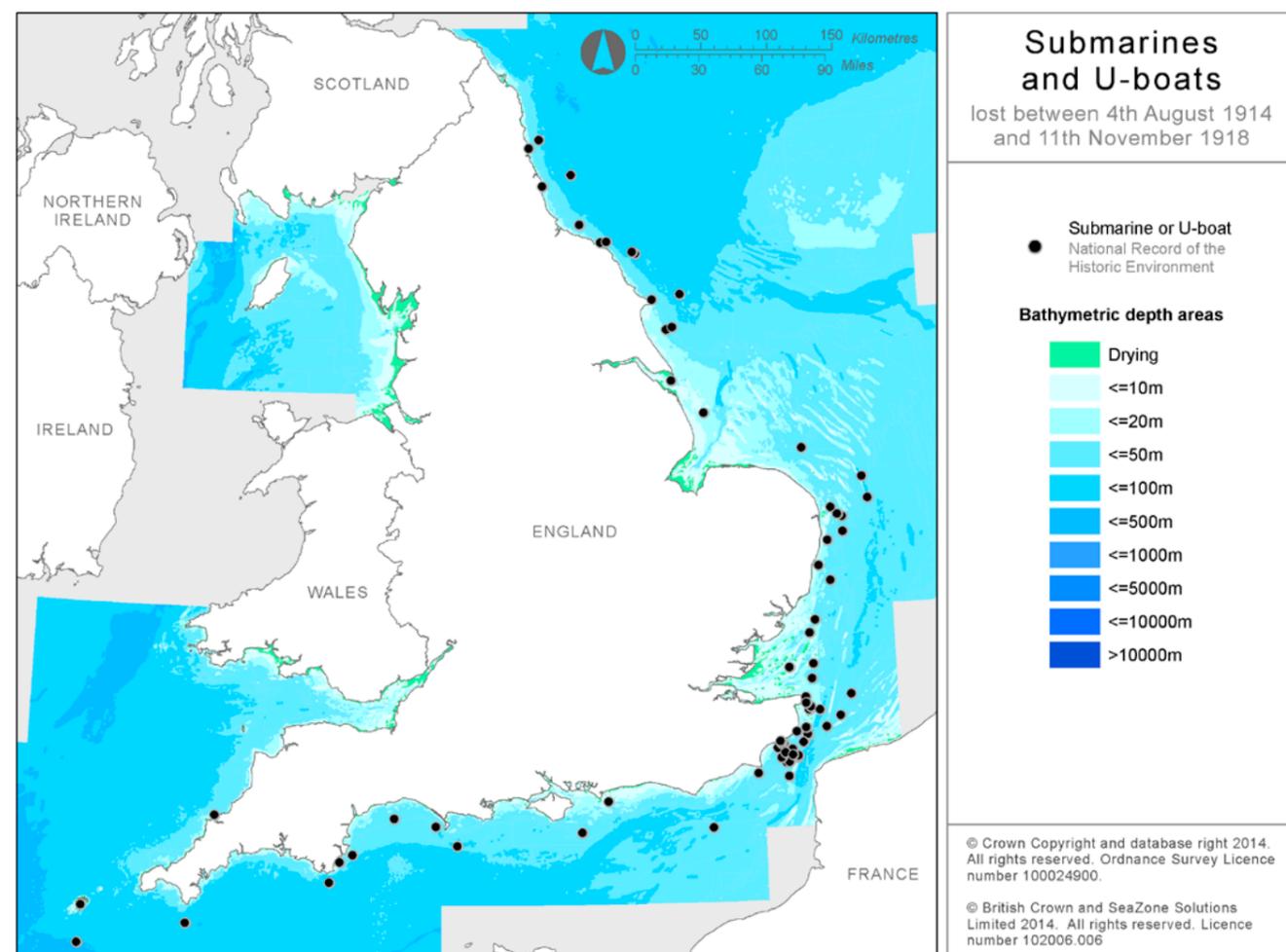
worked closely with the Ministry of Defence to identify wrecks, such as those of *UB-65*, sunk off Padstow in 1918, and *UB-81*, mined off the Isle of Wight in 1917, where there had been a loss of life and where protection as military maritime graves might be appropriate. We also asked researchers and divers to participate by contributing data and information. The increased understanding which resulted from this work provided the first opportunity to inform vital risk management of the submarines, an important benefit given that the wrecks have been on the seabed for 100 years.

As a means to understand the conservation management requirements of the First World War submarines, and metal-hulled ships in general, we also commenced a programme of ultrasonic investigation and analysis (Dunkley 2013). This was prompted by the necessity of understanding the stability of steel hulls

of wreck sites so as to identify means of preventing damage and increased degradation.

Of the 44 U-boats identified, we commenced a programme of desk-based assessment, marine geophysical survey and diver-based observations on ten submarines on account of their rarity and group value (*U-8*, *UB-12*, *UB-17*, *UB-30*, *UB-55*, *UB-75*, *UB-109*, *UC-6*, *UC-46* & *UC-70*). In addition, the British *D5* was included in the study. The project ran through the centenary period and ensured that maritime archaeology contributed to modern historical narratives as a means to connect to the reality of the past.

During the project, two U-boats were identified as having sufficient special interest to warrant investigation for statutory protection: *U-8*, sunk 4 March 1915, and *UC-70*, depth-charged 28 August 1918. >>



Left: Chart showing submarine and U-boat losses off England between August 1914 and November 1918. © Historic England

Above: Contemporary postcard showing the 'Sinking of the German Submarine U8 by a British Destroyer'. The crew are depicted crammed in the conning tower. Courtesy of Mark Dunkley

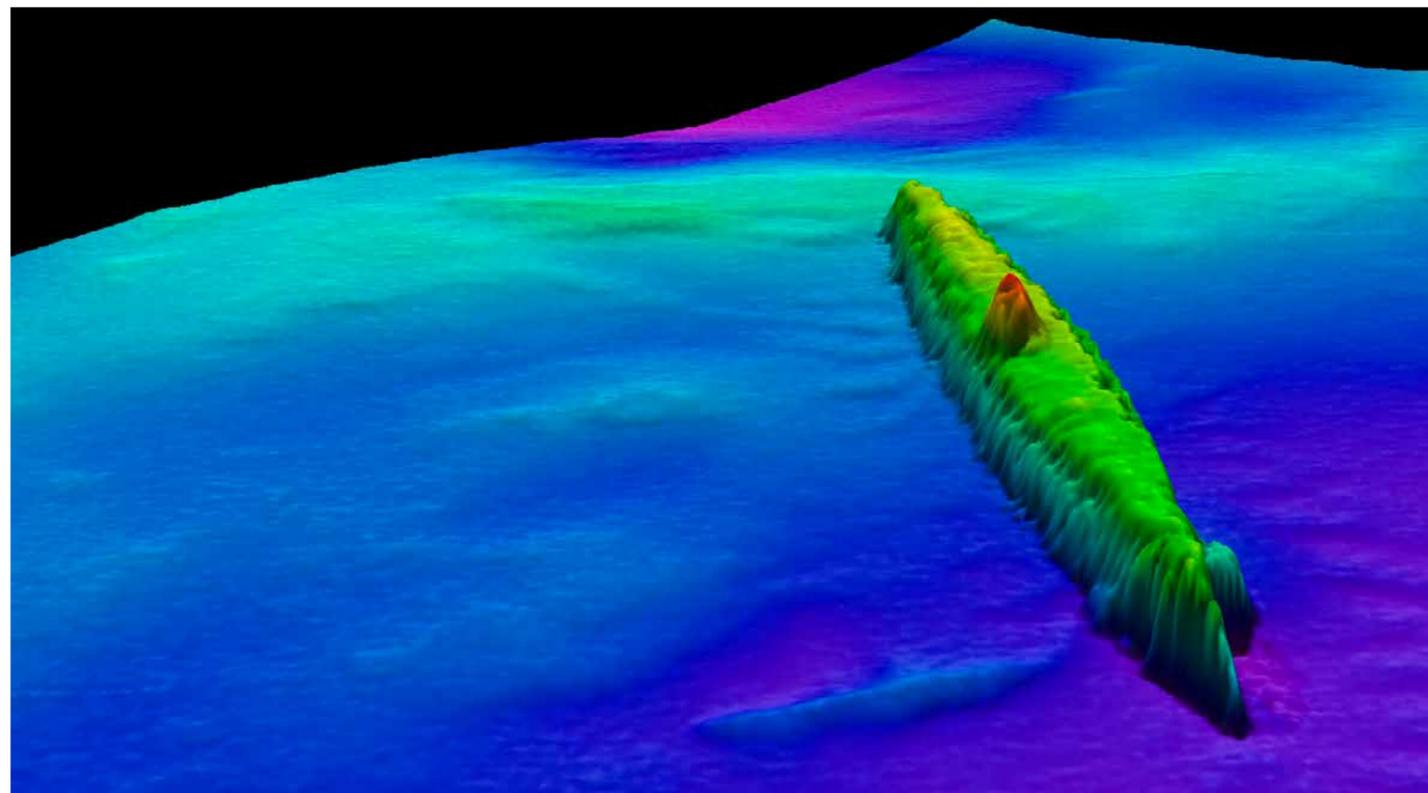
The wreck of U-8

The capture and sinking of the German submarine *U-8* off Folkestone on 4 March 1915 illustrates an early success of the innovative Dover Barrage, an underwater blockade consisting of minefields laid between Belgium and Dover at the outbreak of war, steel netting anchored to the sea bed and monitoring by surface patrols. Launched in 1911 as one of four type *U-5* boats ordered from the Germania shipyard in Kiel, *U-8* was passing westwards through the Dover Strait to attack shipping in the Western Approaches when she ran into the barrage nets. Her attempts to escape attracted the attention of the drifter *Robur* which called up reinforcements. The destroyer HMS *Ghurka* lowered an explosive sweep and fired a charge when it snagged on an obstruction believed to be the submarine. The commander of the severely damaged U-boat, Kapitänleutnant Alfred Stoß, ordered her to surface, where she was abandoned and later sank, though not before HMS *Ghurka* and HMS *Maori* had opened fire, hitting the area around the [conning tower](#).

Innovative acoustic survey commissioned by Historic England in August 2015 collected oceanographic data which confirmed that, after being on the seabed for over 100 years, *U-8* is lying on an even keel with the height of the conning tower extending some 6m above the seabed (Wessex Archaeology 2015). Her three periscopes and radio masts remain *in situ*. A build-up of sediment on the western side of the wreck was identified, with possible hull elements having collapsed from their original position onto the seabed. *U-8* was designated a Protected Wreck Site in July 2016 on account of its historical and archaeological importance.

U-8 lies within a wider military landscape as the English Channel was both a transit area and a battlefield for U-boats until August 1918 when the use of new mines and searchlights as part of the Dover Barrage effectively closed the Dover Strait. German surface raiders attacked the Barrage on at least two occasions in actions that have become known as the Battles of Dover Strait (October 1916 and April 1917).

Today, the Strait is extremely busy and congested with shipping, and visiting divers anchoring over the wreck of *U-8* would be at risk from passing vessels,



Above: Acoustic multi-beam image of *U-8* lying in the Dover Strait. © Wessex Archaeology



Above: Rendered multi-image projection of *U-8* on the seabed today. © MSDS Marine

particularly if the surface visibility deteriorated. We therefore had to find another means of engagement in order to facilitate access to this important wreck site, and we determined that 'virtual' access, by means of an online diver trail, would be an effective way forward.

A digital diver trail combines new technologies such as multi-image photogrammetric recording with virtual reality techniques to allow viewers to see a clear [3D image of U-8](#). Not only does such a trail bring the U-boat to life for non-divers, the images are a lot easier to interpret than more traditional geophysical survey techniques or photographs taken in poor visibility.

The virtual trail for *U-8* complements our other trails and was launched online in November 2017. Within its first three months some 6050 new users accessed the site. All of Historic England's [virtual diver trails can be found online](#).

One twist in the *U-8* story concerned the theft of one of its bronze propellers by divers. It was found by police in the Kent area in 2014 and was returned to the German Navy at a ceremony in Portsmouth Naval Base the following year as a symbol of reconciliation and friendship.

The wreck of UC-70

UC-70 was a Type UC II class of coastal mine-laying submarine commissioned into the German Imperial Navy in November 1916. The submarine conducted ten patrols and sank or damaged 40 ships during the war before being bombed and depth-charged off the East Coast on 28 August 1918 with the loss of all hands.

From reports of the initial investigation by Royal Navy divers searching for intelligence material, and the fact that all the hatches were found open at the time of the discovery, it is reasonable to believe that at least part of the crew tried to escape. The bodies of three of the crew, including that of the commander, were recovered by divers in September and October 1918. The divers found no mines in the chutes, so although the activities of *UC-70* in the days prior to its sinking are not completely known it seems likely that its mine-laying operations had been successful or that the mines were jettisoned. >>

Remote sensing and diving investigations in 2016 revealed that *UC-70* lies in an upright position with a slight list to port (left). The outer pressure hull of the submarine is corroded away in many places but the 88mm deck-gun is still intact and in place and the openings of the six mine-laying tubes are visible on the upper surface of the hull. The bow section of the outer hull, forward of the mine-laying tubes, is badly damaged, most likely as a result of depth charges, but the two periscopes are still visible and *in situ* within their sleeves.

Divers working at an exposed section at the stern observed human remains, comprising the top of an adult cranium and part of the shaft of a humerus or femur, possibly belonging to the same individual. Given their location at the stern of the submarine, these may be those of a torpedo man, stoker or machinist, narrowing down identity to six or seven crewmen. Unusually, a Chinese plate dated to the reign of the Emperor Kangxi (1654-1722) was recovered from the submarine's galley in 1993. It is possible that this plate belonged to a crew member

who served or had contacts at the German naval base at Tsingtao, China, captured in 1914 and an important Far-East base for the Germans.

If judged only by the numbers of enemy vessels destroyed, the UC II is the most successful submarine design in history. Estimates indicate that they sank more than 1800 enemy vessels. Given that major component parts of the submarine remain *in-situ*, both internally and externally, and given the presence of skeletal human remains, Historic England was concerned that parts of the submarine, its artefacts and its crew were vulnerable to uncontrolled salvage. On the basis of its historical and archaeological interest, the wreck of *UC-70* was protected in August 2017.

In order to ensure that the human remains present on the submarine were not sensationalized, we chose not to develop a diver trail on *UC-70*. Instead, we encourage responsible diver access. Such access is enabled through the licensing scheme associated with the Protection of Wrecks Act 1973 which applies to all protected wreck sites. [Licenses are arranged through Historic England.](#)

Managing the past for the future

From 4 August 2014, submerged archaeological remains associated with the First World War, including submarines, began to fall under the aegis of the 2001 UNESCO Convention on the Protection of the Underwater Cultural Heritage. This Convention is intended to enable countries to better protect underwater archaeology by providing a set of rules by which marine archaeological remains can be studied and preserved. As such remains are vulnerable to metal recovery, souvenir and treasure-hunting and the poorly-understood long-term effects of oceanic climate change, the British government has adopted the UNESCO rules as best practice for underwater archaeology.

By following the UNESCO rules, Historic England can ensure that underwater archaeological remains from the First World War continue to be recognised, understood and respected by future generations ■

The author

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Mark is a marine archaeologist with responsibility for the protection of underwater cultural heritage. He regularly works with marine enforcement agencies to detect and prosecute underwater heritage

crime and he advises the UK National Commission for UNESCO on marine matters. He is a professional diver and a Fellow of the Society of Antiquaries.

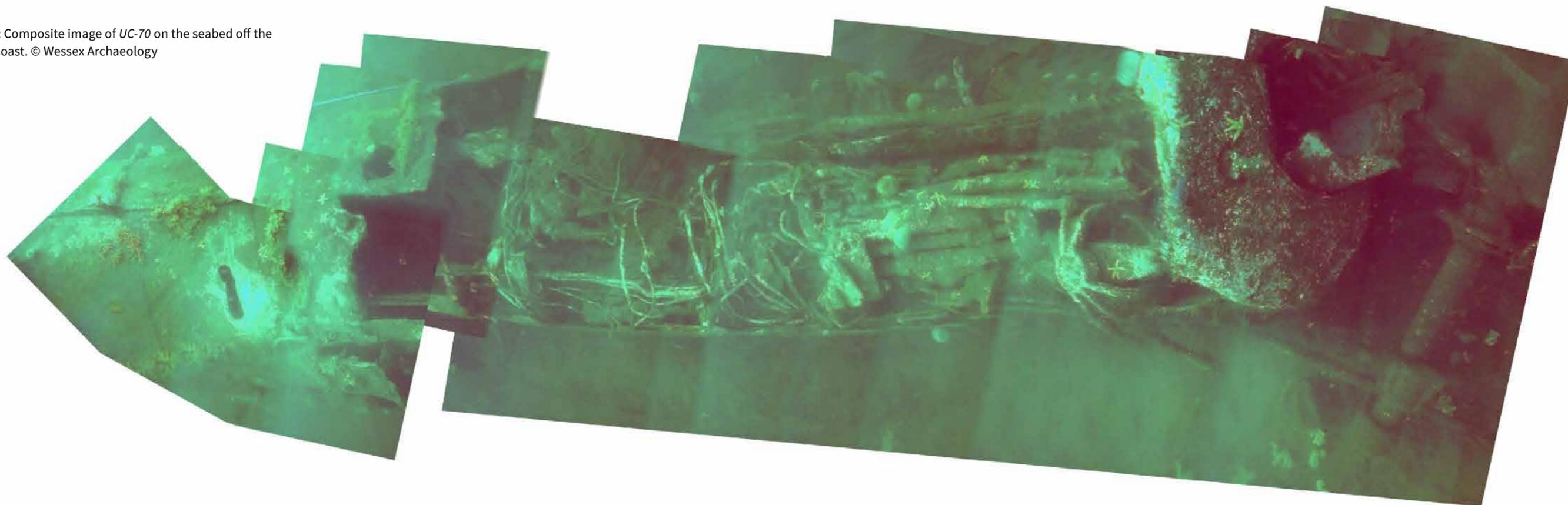
Further information

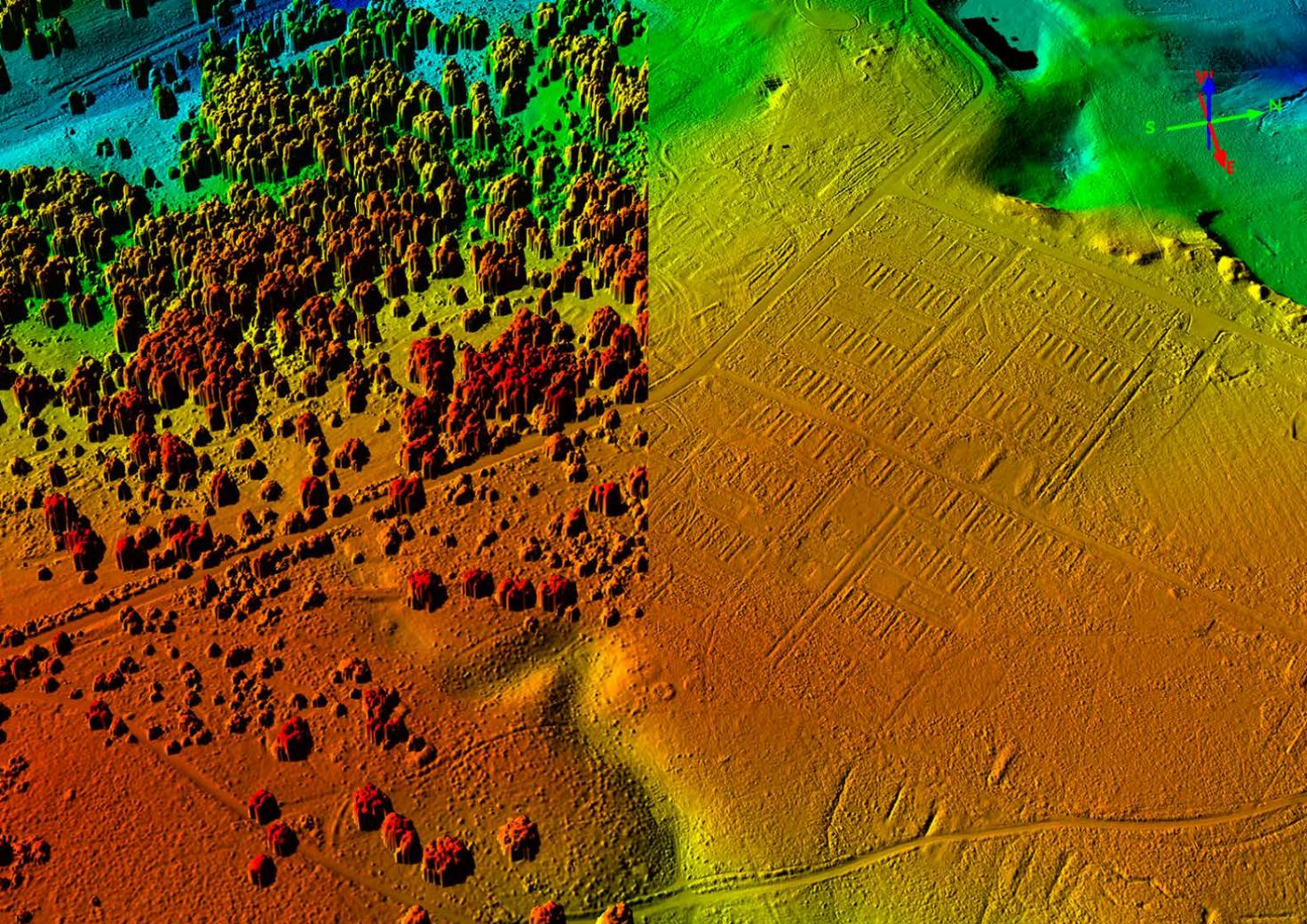
Dunkley, M 2013 'Ultrasonic thickness testing: devising new ways to manage marine heritage'. [Research News, Number 19: Spring 2013, 30-31](#)

Wessex Archaeology 2015 *U8 Marine Geophysical Survey and Archaeological Report*, unpublished report for Historic England

[Learn more about submarine wrecks](#)

Right: Composite image of *UC-70* on the seabed off the East Coast. © Wessex Archaeology





Training on Cannock Chase, past and present

Working with the local community to record First World War training landscapes.



Top: Lidar survey reveals, on the right-hand-side, the regimented rectangular hut foundations of Brocton Camp. Lidar DSM (left) and DTM (right) 04-MAY-2016 © Historic England; source Staffordshire County Council/Fugro BV Geospatial

Bottom left and right: Project volunteers learning about aerial sources and preparing to explore the wartime features surviving along Oldacre Valley. © Historic England

The woodland and heath of Cannock Chase is now a quiet haven for wildlife and walkers, but it was not always so. From 1914 to 1918, volunteers and conscripts from across the British Empire travelled there to receive military instruction to prepare them for active service. Cannock Chase became home to two of the largest training camps in the country: Brocton and Rugeley. A century later, Historic England worked with people from the local community to discover more about the Chase by examining the well-preserved archaeological earthworks there.

Engaging with the Chase

From 2016 to 2018, Historic England was a partner in *The Chase Through Time* project, an initiative led by Staffordshire County Council with support from the Heritage Lottery Fund. The project was

devised to assess the rich history of Cannock Chase Area of Outstanding Natural Beauty and to explore ways of getting local communities and visitors more involved in its heritage. All periods of past activity were investigated, from prehistory onwards, but the main reason for the project was the First World War centenary. Previous investigations suggested that the Chase contained one of the best-preserved First World War training landscapes in England, yet there had been no overall assessment of the remains.

Historic England contributed to the project in two key ways: mapping from aerial sources and promoting volunteer engagement on the ground. Historic England staff used historic aerial photographs, which captured the changing landscape over time, and newly commissioned high-resolution airborne laser scanning

(lidar), which allowed us to see beneath dense areas of vegetation. We mapped and interpreted all archaeological features, visible as structures or earthworks and buried remains seen as cropmarks or soilmarks.

Equally important was the involvement of local people. Classroom workshops demonstrated how to get the best out of aerial resources, and field training days provided hands-on instruction in a range of non-intrusive analytical recording techniques, including walkover survey, earthwork survey and geophysical survey. A rewarding and mutually beneficial relationship was fostered between both parties: Historic England shared skills and provided archaeological expertise, while volunteers reciprocated with detailed knowledge about the history and geography of their local landscape. >>

Exploring the military training areas

Rugeley Camp was established within weeks of the outbreak of war in 1914, followed by a sister camp at Brocton. Upon completion, they covered vast areas of the heath and hosted thousands of soldiers training for combat. The camps became self-contained towns, with their own railway lines, depots, shops, hospital and even a theatre. Part of Brocton Camp was later used to house prisoners of war. The layout and form of the camps are well documented on maps and postcards from the time, and in many areas the extensive foundations of individual buildings can still be clearly identified on the ground.

But what lay beyond the limits of the hutted settlements? Aerial and ground evidence shows that large areas of the heath were used as firing ranges, assault courses and practice trench systems. Prior to this project, the complex training infrastructure that surrounded the camps was largely unknown, except in a few limited areas. >>

The camps became self-contained towns, with their own railway lines, depots, shops, hospital and even a theatre

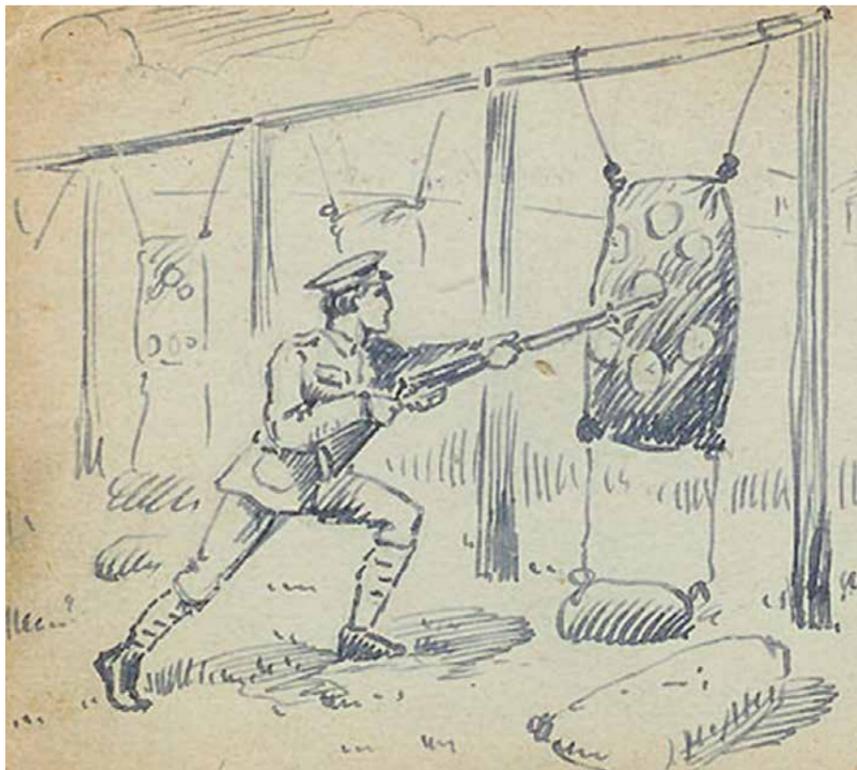


Top right: The regimented lines of rectangular huts bases and camp roads of Rugeley Camp are still clearly visible from the air and on the ground. © Historic England 29209_046 11-Mar-2014

Right: This historic postcard shows part of Brocton Camp. It was completed in 1915 and occupied most of Oldacre Valley. © Jake and Gill Whitehouse and reproduced with kind permission

The ground immediately adjacent to the accommodation huts became the focus for some of the most intense training. Using lidar data, we were able to identify and map a large number of assault courses. These comprise a series of short parallel linear trenches, effectively representing the different lines of trenches on a real battlefield. Contemporary accounts suggest that barbed wire was interspersed between the trenches and mock shell-holes were dug. Gantries were also erected to hang straw-filled sack dummies used to train the soldiers in bayonet practice.

Some of the practice earthworks were more elaborate than others and some match examples found in instruction manuals of the period. One example is the 'nursery labyrinth', a close-knit array of traversed trenches dug at right angles at set distances to minimise the effect of flying shrapnel from a shell or grenade blast, with up-cast parapets and parados (a rear parapet). Other forms of trench were identified, including a 'low command redoubt', a stronghold that was a common feature on the Western Front. Additional earthworks were probably constructed for specialist training units such as sappers, engineers, machine-gun squads or artillery. The training facilities also incorporated a detailed miniature model of the Messines landscape and battle-lines recreated in concrete. The model was constructed by members of the New Zealand Rifle Brigade, using German prisoners of war as labour. It was given scheduled status in 2017.



Top: Erskine Williams, a bandsman in the Sherwood Foresters, trained on the Chase during the Great War. He recorded his experiences through a series of sketches: this one depicts the use of a sack dummy for bayonet practice. © Daphne Jones, reproduced by kind permission of Daphne and Nicholas Jones

Above left: The use of lidar revealed subtle earthworks which are barely visible on the ground, such as this assault course. © Historic England; Lidar DTM 04-MAY-2016. Source Staffordshire County Council/Fugro BV Geospatial

A large number of firing ranges were established on the Chase. These include 600-yard 'full-calibre' ranges, where soldiers would carry out advance and firing exercises, and smaller 30-yard ranges for the more 'indifferent' shot. Some of our most useful insights into the ranges came from a walkover exercise with the volunteers. By exploring the remains on the ground, the group was able to better understand how the surviving features could have functioned, and ideas distilled from

these onsite discussions fed directly into the interpretation and record. Perhaps the most exciting discovery was an extensive and elaborate mock battlefield located in the Sherbrook Valley, equidistant between the two camps. The 'battlefield' comprised nearly 43 hectares of practice trenches, arranged as two opposing fronts on either side of a dry valley. Each front consisted of a traversed fire trench (front line) with support

and reserve trenches. The reserve trenches were located on the counter slopes of the naturally undulating ground, preventing them from being viewed from the opposing positions. Perpendicular to these, a series of sinuous communication trenches allowed soldiers to move from the reserve lines up to the front with relative ease whilst still under cover, and observation or listening posts extended beyond the front lines into 'no man's land'. >>

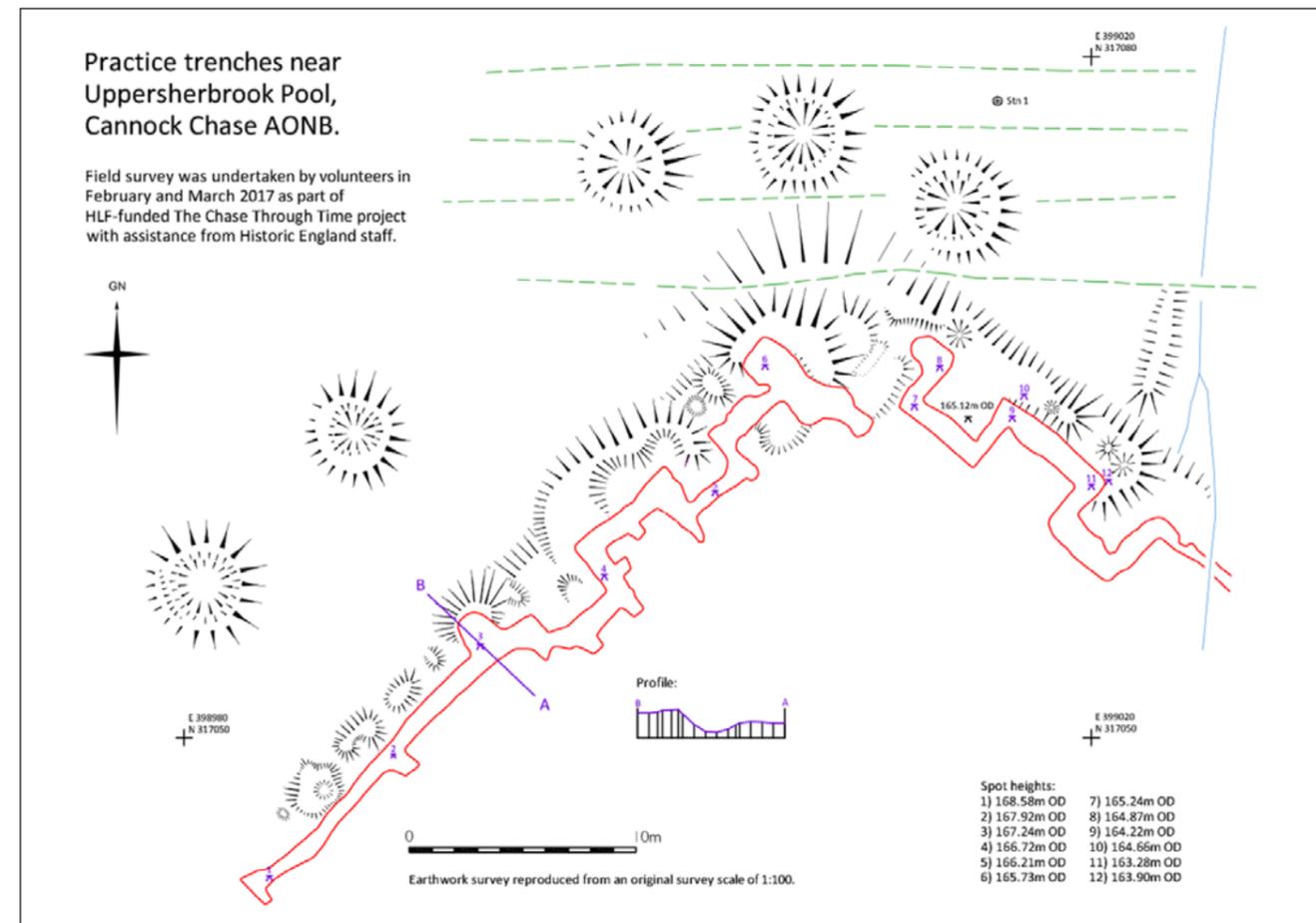
The training facilities incorporated a detailed miniature model of the Messines landscape and battle-lines recreated in concrete



Above right: The Cannock Chase 'battlefield'. This depiction is partly schematic in that, although the trench lines are visible as low earthworks, not all of the individual traverses remain visible. © Historic England; Lidar DTM 04-MAY-2016. Source Staffordshire County Council/Fugro BV Geospatial.



Above left: Project volunteers carefully measuring and drawing a portion of practice trench in the Sherbrook Valley.
© Historic England



Above right: The survey of a portion of traversed practice trench produced with some of the volunteers. It shows the parapet spoil mounds along its north edge and mock shell holes beyond.
© Historic England

The archaeological evidence shows that the 'battlefield' was constructed perhaps in preparation for the Battle of the Somme

With our assistance, volunteers investigated part of this battlefield complex. They spent time looking carefully at the features and used simple hand-survey techniques to create an accurate measured plan. It was discovered that an L-shaped stretch of traversed trenches were around one-third scale, and nearby

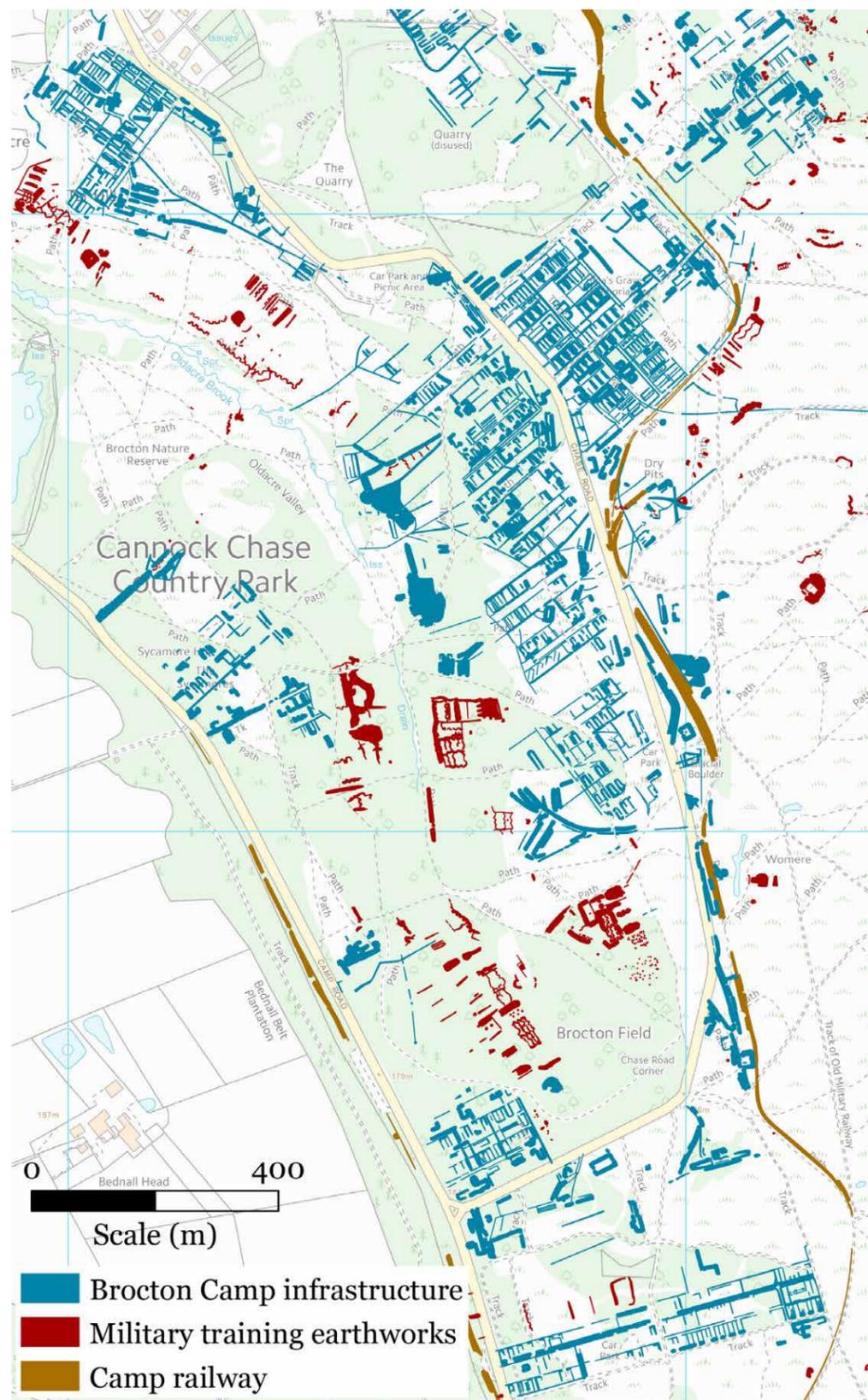
circular pits within raised rings of spoil were artificial shell holes that had been hand-dug to simulate battlefield conditions during training manoeuvres. The no man's land between the trench systems was similarly peppered with these mock shell holes.

The archaeological evidence shows that the 'battlefield' was constructed as a near textbook example, perhaps in preparation for the Battle of the Somme. It displays all the elements that would be expected to be found in the real theatre of war, down to details such as dugouts for latrines.

The trenches appear to have been largely backfilled, presumably at the end of the war, but the degree of disturbance and the size of the now largely levelled parapets, suggests that at least some of them were constructed at full scale and depth.

There is only scant documentary evidence for this mock battlefield. William Elmhirst, an officer in the 9th Battalion East Yorkshire Regiment, wrote in February 1916 that the 'trenches we propose spending 48 hours in, aren't half finished yet, no dugouts of any sort'

(Elmhirst 2011, 110). The following year, Alick Trafford, who served with the New Zealand Rifle Brigade, made sketches and descriptions of an area of the training ground used to practice a trench-to-trench attack in November 1917 (National Library of Zealand, item 2003-171-17/1). >>



Above: The aerial mapping results for Cannock Chase illustrate the extensive survival of First World War fieldworks; this extract shows the regimented huts of Brocton camp with assault course training earthworks adjacent. Archaeological mapping © Historic England; Base map © Crown Copyright and database right 2018. All rights reserved. Ordnance Survey Licence number 100019088

The project's legacy

The project has enriched our understanding of the archaeology of Cannock Chase, recording its physical elements and helping to secure its future. Previously, the overall form, extent and survival of the extensive field training areas and camps had not been fully appreciated. The variety of dug features is much greater and more nuanced than previously known. The surviving earthworks are a testament to the reality of the war and the intensive training required. Comparing the physical remains of the trenches and huts to information in 100-year-old postcards, drawings and diaries brings the history of the Chase to life and allows us to make personal connections to the soldiers stationed there.

The results of the aerial investigation were input directly to the Staffordshire Historic Environment Record and are being used for planning and management. Analysis of the results of the Historic England contribution to *The Chase Through Time* project are published in a detailed [research report](#) (Carpenter *et al* 2018). The lidar data and an archaeological map based on aerial sources are available online via an ArcGIS map hosted and maintained by Historic England. These resources, alongside the legacy of shared field skills, will inspire and enable the volunteers and others to continue with investigation and research into the fascinating story of Cannock Chase.

Acknowledgements

The authors would like to express their gratitude to all those who contributed to the *Chase Through*

Time project and, perhaps most importantly, to the project volunteers: our deepest thanks to all of them for their able assistance and infectious enthusiasm! ■



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landscape research projects for six years, before joining English Heritage in 2010. As a member of Historic England's Historic Places Investigation Team, she is responsible for undertaking a wide range of applied research projects and analytical survey tasks.

Further reading

Carpenter, E, Knight, D, Pullen, R and Small, F 2018 *Cannock Chase, Staffordshire: The Chase Through Time, Historic England Contribution*. [Historic England Research Report Series 7-2018](#)

Elmhirst, P B 2011 *The Family Budget 1914-1919*. York: The Elmryste Press

Wilkes, R 2010 *Brocton WWI Army Camp, Cannock Chase Staffordshire: An Investigation of the Window Glass*. [English Heritage Research Report Series 10/2010](#)

To help facilitate continued engagement with the newly mapped archaeology of Cannock Chase, Historic England have developed an [online ArcGIS portal providing public access to The Chase Through Time aerial mapping results and lidar](#)

First World War National Factories

Identifying the places where
wartime production was coordinated.

The First World War was the first major conflict fought between the most heavily industrialised European powers, including Great Britain, France and Germany. They were not only leaders in heavy industry, coal and steel production, and engineering, but also in state-of-the-art technologies including chemicals,

the internal combustion engine, wireless communications, and flight. Although Great Britain was a well-established armaments producer, the challenges it faced were to increase production to equip its newly formed citizen army and to devise innovative weapons, often combining novel technologies. >>



Cliffe explosives works, Medway: in the foreground are the remains of the acetone recovery house and, to the rear, the acetone recovery stoves. DP141667 © Historic England



Above left: Cliffe explosives works, Medway: remains of guncotton drying stoves. 26891/019 © Historic England, Damian Grady

Prior to the war, state armaments production was concentrated in a handful of factories within striking distance of London, at Woolwich, Enfield and Waltham Abbey, along with a newcomer at Farnborough, Hampshire, devoted to balloons and aircraft. The royal dockyards at Chatham, Portsmouth and Plymouth were also some of the great industrial enterprises of their age. Alongside these, large engineering firms such as Vickers were important suppliers and also amongst the world's leading arms exporters.

Gearing up for modern warfare

The existing infrastructure was, however, organised to equip a small standing, professional army, largely charged with policing the empire, while a powerful fleet was maintained for its deterrent value. As the conflict in western Europe stagnated into entrenched front lines, shrapnel shells that were effective in the open had little impact on fortified field works. This came to a crisis in spring 1915, resulting in the so-called 'shells scandal'. One response to this was the



Above right: Rotherwas, Herefordshire, National Filling Factory, designed by Ministry of Works architect Frank Baines. DP195747 © Historic England

creation of the Ministry of Munitions. In an unprecedented step the government took direct control of the most important factories. These produced everything needed to wage a world war, from the mundane – wooden boxes and concrete slabs – to explosives, shells, and aircraft.

At the beginning of the war a pragmatic approach was adopted and extensions were added to existing factories, such as at the private explosives works at Cliffe, Medway. Despite being a national scheme

no standard factory types emerged and often a local manager would be charged with constructing a factory that he would later operate. In other cases the Ministry of Munitions, using experts from the Office of Works, was responsible for the design of some of the larger works. One of the architects who made the greatest contribution was Frank Baines, who prior to the war had been responsible for the conservation of many ancient monuments in the care of the government. >>

In an unprecedented step the government took direct control of the most important factories

The new National Factories

Regardless of the huge manpower and material cost of the war, architectural standards were upheld and a plain neo-Georgian style typified many of the larger government factories. In contrast to this conservative face, many of their workshops adhered to the most up-to-date principles of factory organisation. Following the theories of scientific management advocated by the American Frederick Taylor, mass production of complex items was broken down into individual tasks. In the munitions industry it was known as 'dilution'. In the past a skilled worker might undertake a number of processes to produce a single item. Under the new system an unskilled worker might carry out just a single task. Workshops were laid out to create logical production lines, often with electric motors powering individual machines. Increasing concern was also shown for the well-being of the work force,

especially for the increasing numbers of women and of boys below conscription age. Works canteens became commonplace, many factories also grew their own vegetables, and at Barnbow, West Yorkshire, a herd of cows was kept for fresh milk.

At the outbreak of war Great Britain had been an industrialised nation for nearly two centuries and most large towns had engineering works, often manufacturing agricultural machinery. This local engineering know-how, applied by firms with little or no experience of armaments work, produced some of most inventive weapons designed to break the deadlock of the trenches. Famously, the agricultural engineers of William Foster, Lincoln, produced the first tanks. William Mills of Birmingham developed a hand grenade that took his name, and the civil engineer Wilfred Stokes, trained by the Great Western Railway, developed a new type

of trench mortar. This well-established industrial base was in sharp contrast to many of the belligerent powers, especially in Eastern Europe, whose economies remained essentially agrarian.

Gathering evidence of wartime industrial production

The centennial period has provided an opportunity to review what survives of this great enterprise. The project also illustrated the challenges of studying the industry of the recent past. As might be expected of a government department, the Ministry of Munitions kept meticulous lists of the factories under its direct control. Many of the factories were, however, only given general addresses and a century later it required considerable detective work to locate the individual works. On Clyde Street in Bootle, Liverpool, it is known that the Technical Engineering Company was producing gauges used in shell

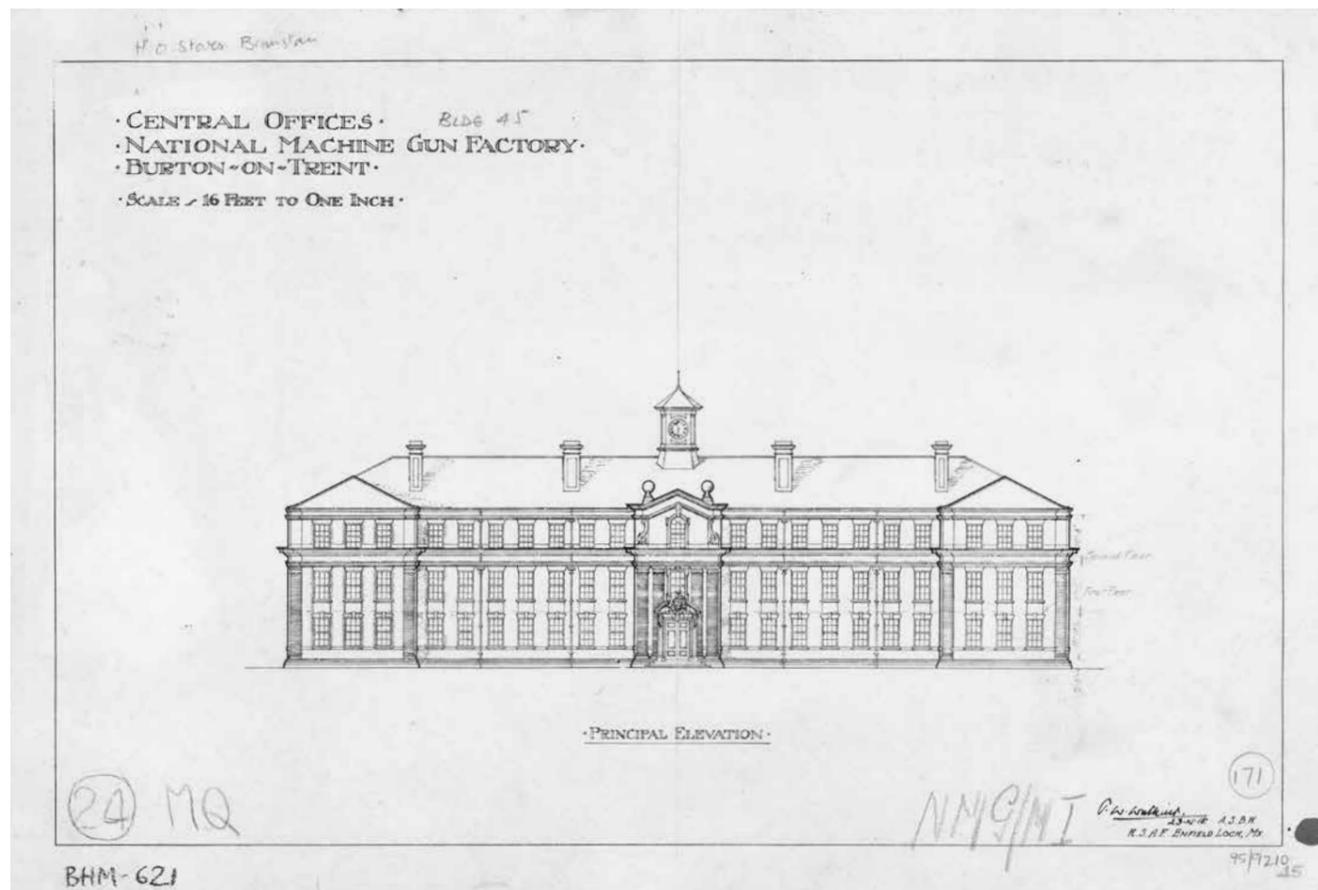
manufacture. However, it would require a significant amount of perhaps fruitless local research in attempts to pinpoint the exact building.

Munitions production was, perhaps surprisingly, extensively recorded by contemporary photographers. For many National Factories, the Ministry of Munitions collected photographs to document the progress of construction and the production processes. The Historic England Archive holds a large collection of images by the commercial photographers Bedford Lemere and Company. Amongst this collection are a number of images showing war work, especially in the works of some of their pre-war clients, such as the shipping line Cunard. They are an important source of evidence for the factories and machinery, and also unique records of the working conditions and dress of the workers. >>

The project illustrated the challenges of studying the industry of the recent past

Below right: Cunard's Shellworks, Liverpool: women workers turning 8-inch calibre artillery shells. BL 24001/021

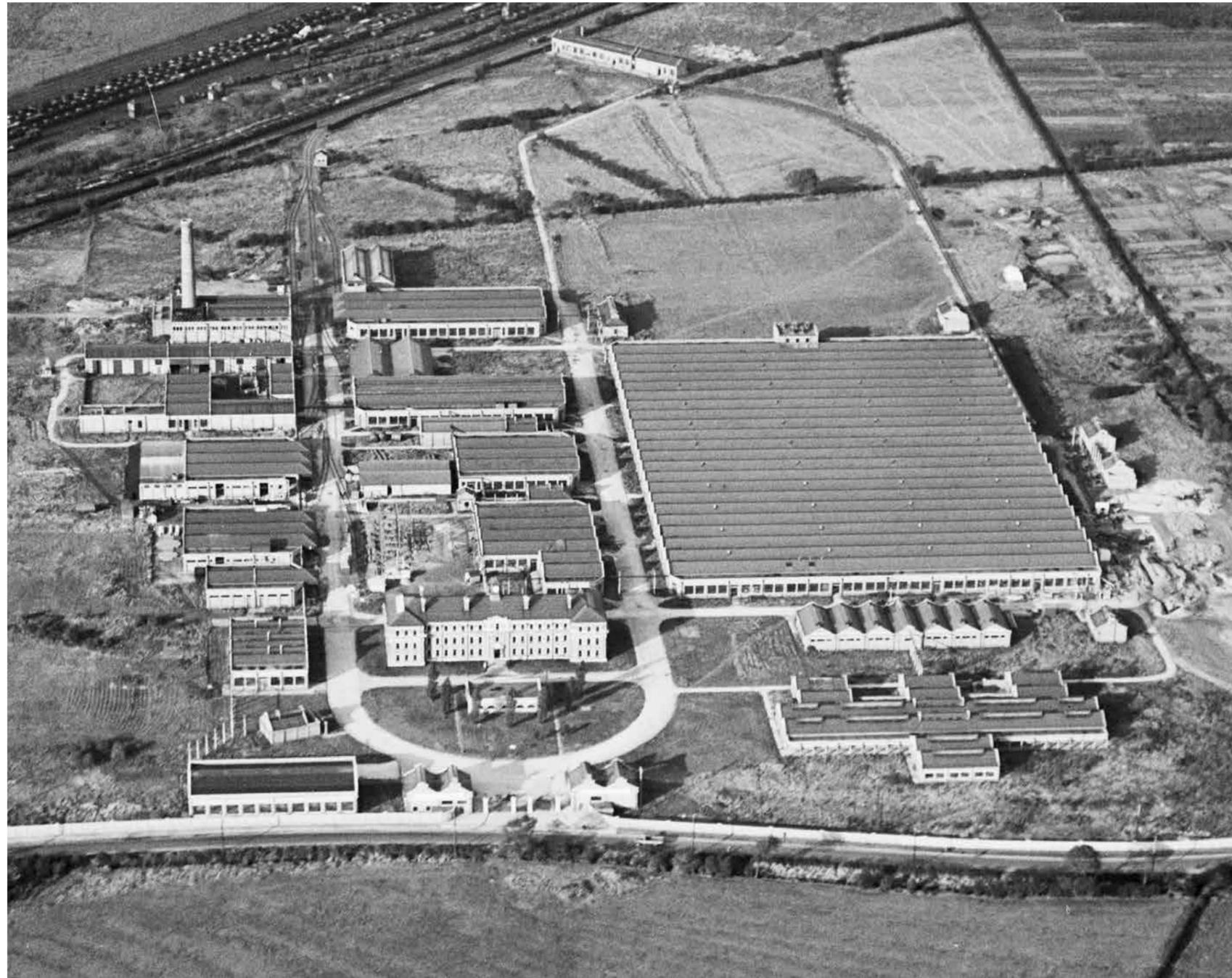
Below left: National Machine Gun Factory, Burton on Trent, Staffordshire: original architect's drawing of the central offices, now listed Grade II. MD95-09210 © Historic England



Another important source of information that has become available to researchers is the former Aerofilms collection, now available on-line as [Britain from Above](#). Beginning in the 1920s, this series, with many photographs taken by former wartime flyers, presents an unparalleled record of the industrial scene shortly after the end of the war.

The task ahead

In common with other projects designed to locate and research the places on the Home Front crucial to the war effort, there is more investigation to be undertaken into wartime industrial production. Of the 170 National Factories in England, 28 still remain to be located due to difficulties in pinning down imprecise addresses. Even less is known about the 6,000 controlled establishments, their locations, products and wartime appearances. The industrial history of the war remains imperfectly understood and future comparative studies of the responses of the other belligerent powers would be a particularly fruitful area of research ■



Right: National Machine Gun Factory, Burton on Trent, Staffordshire: the imposing central offices and regularly positioned production shops. EPW019682 © Historic England

The author

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Wayne manages one of Historic England's Historic Places Investigation Teams. His research interests include the industrial

archaeology of explosives manufacture, the Cold War and the heritage of the 20th century. He has published widely on these topics and has recently co-edited a book on effects of the First World War on England. He is a fellow of the Society of Antiquaries.

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Discovering First World War wireless stations

Cataloguing the remains of England's network of wireless communications.

They provided a powerful tool – in co-ordinating military operations, air defence, enabling intelligence gathering, deciphering enemy messages and monitoring communications of enemy vessels, Zeppelins, and aircraft.

Despite its significance the development of wireless communications has, until recently, remained a relatively under-research topic. An Historic England funded research project carried out by Oxford Archaeology addressed this gap by identifying the location and survival

of First World War wireless stations in England. It also investigated the role, physical form and archaeological potential of surviving stations (Phimester 2015).

In total some 215 sites were identified, the largest category of which were coastal and/or intercept sites (87 sites); these formed the focus of the study. Information about each site was added to the Council for British Archaeology's (CBA) Homefront Legacy database, which provided a platform for volunteers to add supplementary information about individual sites. >>



Above: Direction Finding outfits before leaving for France in November 1914, outside Marconi Works, New Street, Chelmsford. © Bodleian Library, MSS.Marconi 335

Historical context

Wireless technology developed at the turn of the century with the formation in Britain of the Wireless Telegraphy Company in 1897 under Guglielmo Marconi. This became a major rival of the German Telefunken company, founded in 1903, and Germany and Britain became locked in a commercial and technological arms race, both realising the potential of a technology that gave great strategic advantage in wartime. The military, particularly the Navy, was quick to pick up on the developments which were used in early 20th-century conflicts.

Wireless communications, for example, allowed naval commanders to maintain close contact with their vessels deployed around the globe. But they also exposed communications to interception, and just prior to the war wireless interception stations were developed, which had the capability to gather intelligence from the enemy. This use of signals intelligence was ultimately of major significance in Britain's success in the First World War.

At the outbreak of the First World War, the British government immediately took control of parts of the Marconi

Britain and Germany realised the potential of a technology that gave great strategic advantage in wartime

Company, and the War Office created the Wireless Signal Company in 1915. This early adoption of wireless technology gave Britain an edge in the war for, in contrast to Britain, Germany continued to issue unencrypted messages. Most operational signals, for example those sent to minesweepers to sweep passages clear by a certain time, enabled a picture to be built up of enemy activity. The realisation of the advantage wireless could give to the enemy made the British more conscious of what it could give away by a too liberal use of the technology.

Wireless communication became one of the 'transformational technologies of the 20th century' (Cocroft 2013), the material evidence of which survives in the remains of the wireless stations built around the country. The stations fulfilled various roles, including ship-to-shore communications and training schools, but the most significant were the interception and direction-finding stations (categorised as 'Y' stations), used to determine the position of enemy wireless stations, airships, aircraft, warships and submarines. >>

The location of wireless stations

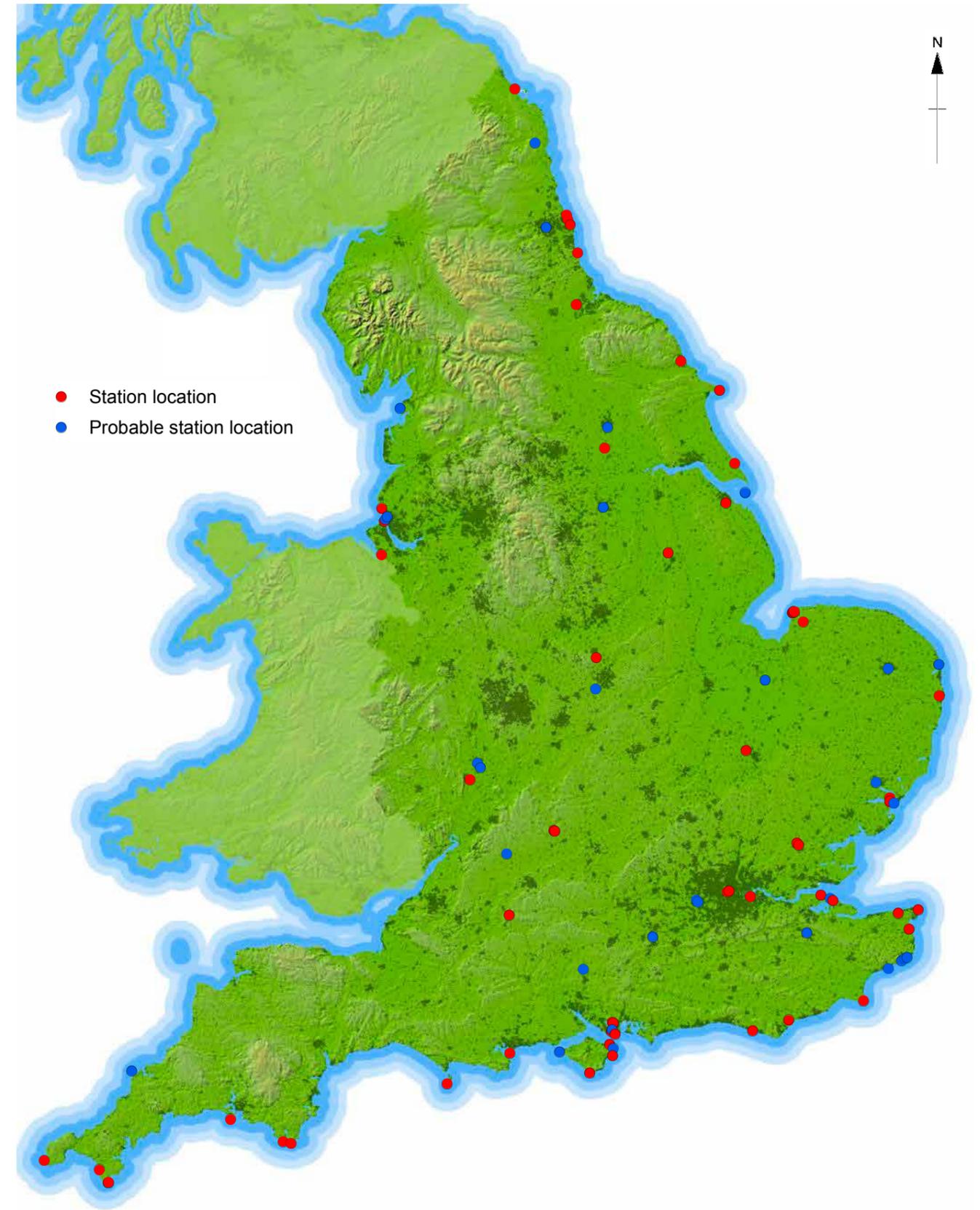
A system of wireless direction-finding stations was developed at home and abroad. A large network was developed on the Western Front, and the Imperial Wireless Chain connected the countries of the British Empire. In England, the majority of the eighty-seven stations in use during the First World War were located close to the shoreline, particularly along the south and east coasts of England, stretching from Penzance to Berwick-upon-Tweed. The location of the stations was determined by the volume of maritime traffic: clusters of stations were situated in the strategically important ports of Liverpool and Portsmouth. Stations along the east coast enabled the interception of messages and transmissions over the 'German Ocean', and a further cluster of stations on the Isle of Wight gave clear views across the English Channel.

Open aspects for good transmissions were an important factor in the siting of stations, as is evident in the cluster around the Isle of Wight and a number of inland sites in

elevated positions. Existing infrastructure such as roads, buildings, water or close proximity to a telegraph line also influenced location. Stations were often situated in defence sites as part of a wider network of military infrastructure in the area. The Port War Signal Station, for example, was sited within Dover Castle, and another station was located in Fort Blockhouse, Gosport.

The project identified the location of each station through a combination of archive research, predominantly at the Bodleian Library, where the Marconi archive is held, and The National Archives. Cartographic sources were used to establish the location of stations and provided information about their size and layout. Once the location of a station was known, modern mapping was used to generate a national grid reference, and satellite imagery was examined to determine the degree of survival. This process had complexities, since stations were often not mapped and existing buildings were often adapted for secondary uses, so that their classified wartime functions were not shown. >>

Right: National distribution of First World War coastal wireless and/or intercept stations.



Contains Ordnance Survey data © Crown copyright and database right 2014

Cartographic sources were used to establish the location of wireless stations



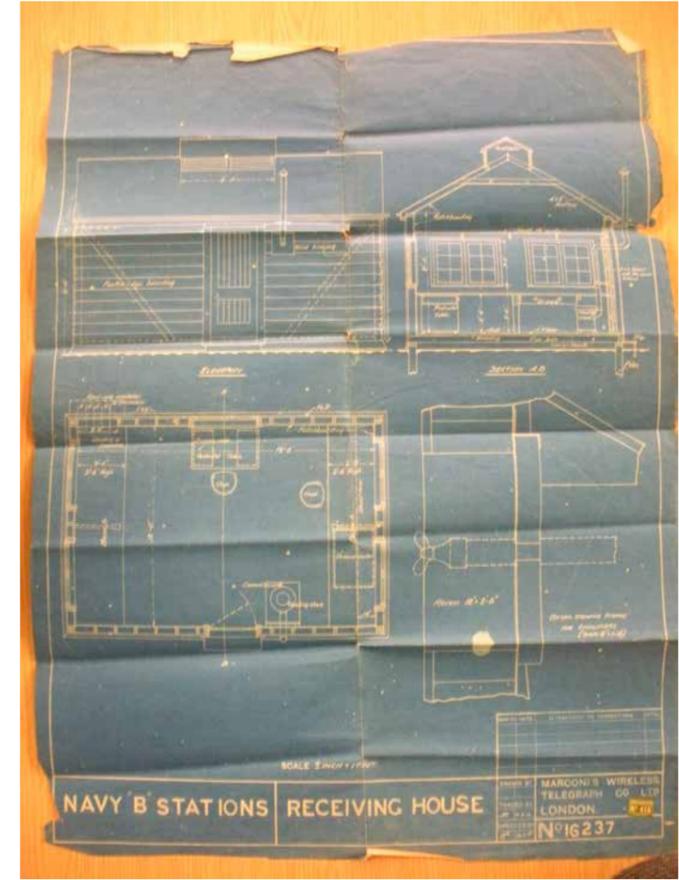
The layout and form of buildings were not standardised, but varied according to the station's role

Form and function

Research into the architecture and layout of each site was informed by the material evidence of surviving stations, historic photographs, aerial imagery from websites such as 'Britain From Above', as well as by building plans and written accounts found in archives. This showed that the layout and form of buildings were not standardised, but varied according to the station's role, significance and the date of construction.

The wartime station at Hunstanton, Norfolk, which survives today as residential accommodation, was of timber-clad construction. The pre-war Marconi station at the Lizard, Cornwall (Grade II listed), consisted of two small timber-clad rectangular structures and a mast surrounded by a fence. In contrast another pre-war station six miles distant at Poldhu, which famously sent the first transatlantic message to the Marconi

Above left: Hunstanton Wireless Station, Norfolk, 'Hippisley's Hut'. DP182223 © Historic England, Patricia Payne



Archive research identified detailed plans of wartime wireless stations and inventories of kit

Above right: Navy 'B' Stations, Receiving House. © Bodleian Library, MSS.Marconi 339

station at Newfoundland, was significantly larger, with five interconnecting main buildings, eight posts and five masts. A rare surviving station at Cullercoats, Tyne and Wear (Grade II listed), is brick-built with segmental arches and cusped bargeboards.

Archive research identified detailed plans of wartime wireless stations and inventories of kit. They showed that other buildings may have included an engine

house, battery house, guard room, canvas tents, sentry posts, latrines and sanitary huts, as well masts and anchor stays. A quote from a local builder in Aberdeen in 1917 describes the wireless station huts to be constructed on site as being weather-boarded, with a felt roof and bargeboards on the gables. Each hut had four windows, double doors, benches, a hatch for messages and a stove with a smoke pipe (MS.Marconi 335 – 339). >>

Assessing significance and archaeological potential

The archaeological potential, above and below ground, of each wireless station was assessed as part of the project, using online aerial imagery and investigation of resources such as Historic Environment Records. Several sites were already protected through scheduling and listing, whilst others are protected through the listing or scheduling of larger military complexes, as is the case, for example, for the Admiralty Signal Station at Garrison

Point Fort, Sheerness, Kent. Following the publication of the report, the station at Stockton-on-Tees, County Durham, was listed at Grade II: although the station was previously known about, the report helped to establish the rarity of its survival.

Potential surviving remains of wireless station structures were identified at Malvern, Worcestershire; Neston, Cheshire; Bolt Head, Devon; Seaham, County Durham; and Cawood, North Yorkshire. They all require further investigation.

Below left: Stockton-on-Tees Wireless Station, County Durham. DP174576 © Historic England



It is hoped that local volunteers may investigate and update information about sites with archaeological potential

A number of wireless stations occupied existing buildings which are thought to survive, although as these returned to their original use post-war, little evidence of their wartime use is likely to be extant. The study also identified the sites of twenty-three stations in remote coastal locations where evidence of footprints of buildings or below-ground archaeology may survive. Burial pits may contain parts of wireless kit or domestic debris. By putting this information onto the CBA's Homefront Legacy database, it is hoped that local volunteers may investigate and update information about sites with archaeological potential.

The study of wireless stations and their technology has considerable potential for further research, not only in understanding more about individual stations but also about the wider context of the subject. There has been research from a technological and engineering perspective, but less from a historical and archaeological stance. The Historic England project made an initial step towards reconciling these two realms, but there remains considerable potential, through desk-based and archaeological investigation, to better understand the topic nationally and internationally ■

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Further reading

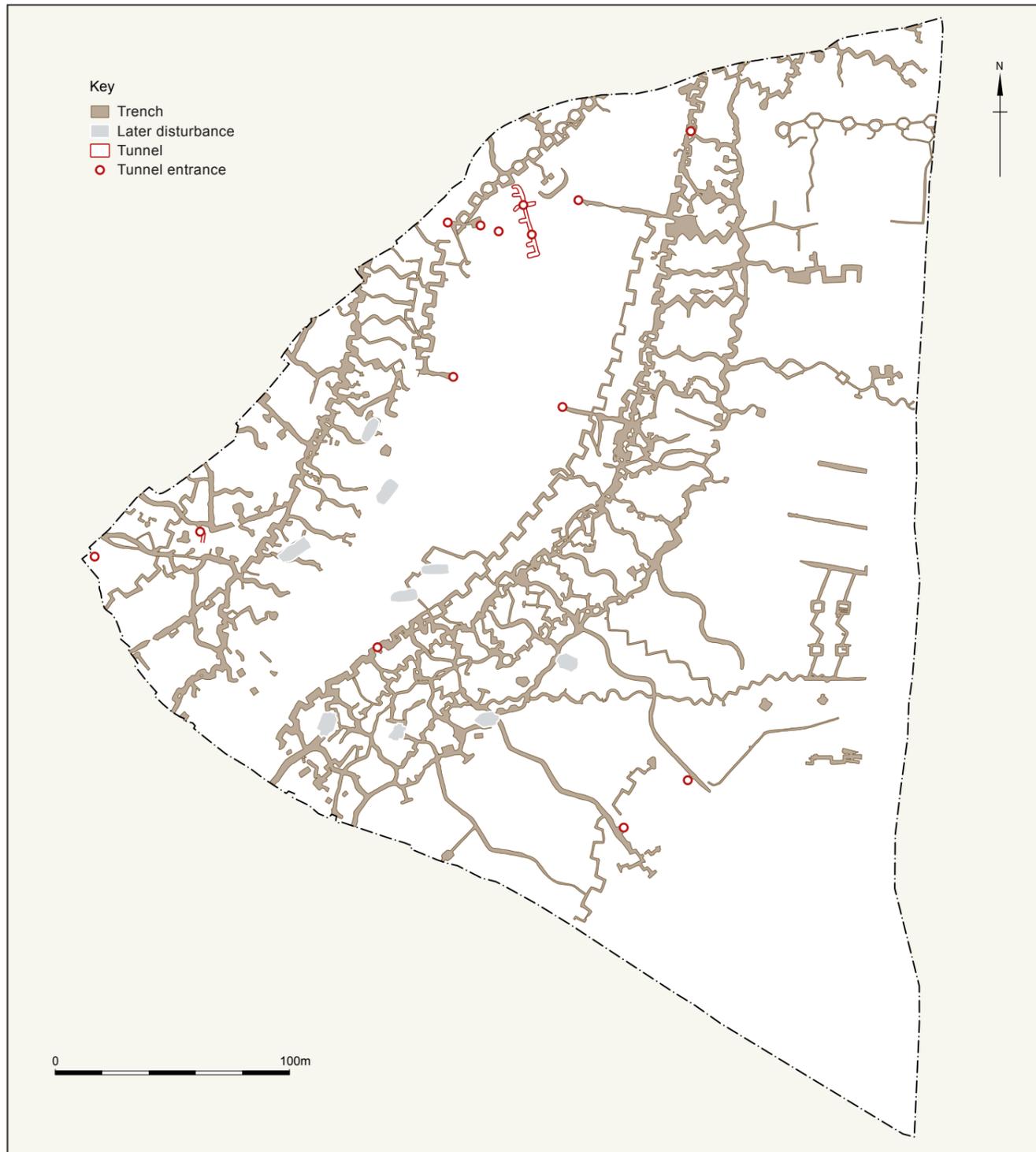
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Archaeology and memory at Larkhill

Getting close to the experience of First World War battlefield training on Salisbury Plain.

Extensive remains of First World War military training have been investigated at Larkhill on Salisbury Plain, Wiltshire, during archaeological works undertaken by Wessex Archaeology in advance of development by Defence Infrastructure Organisation. The British Army's Larkhill garrison has been earmarked for 400 new Army family homes as part of wider plans to base 4000 additional Service personnel and their families on and around Salisbury Plain from 2019. Excavations on one site for new housing, covering 23.14 hectares, has revealed around 8km of trenches, as well as tunnels, providing significant evidence for training activities. In addition, over 100 pieces of graffiti, mostly of soldiers' names, were also recorded. The Larkhill excavation is the single largest archaeological investigation of a First World War training landscape to date. >>



Above: Plan showing the extensive trenches and tunnels created in 1916 to train Australian troops for the Somme offensive. Courtesy Martin Brown/WYG

Recording the training landscape

Salisbury Plain had seen the expansion of military training, as well as new garrisons, from the end of the 19th century, but the First World War saw a massive expansion of operations and the construction of numerous temporary camps, including Larkhill. By the end of the conflict, training troops at Larkhill had created a representation of a First World War battlefield with two opposing lines of trenches facing each other across an area of no man's land. Beneath the trenches and under no man's land were over 280m of tunnels.

The extent of the trenches, with firing lines and communication trenches, saps and other positions, required that the research project should have a robust sampling strategy. Sample excavations to characterise a range of remains were undertaken. This allowed the majority of trenches to be rapidly addressed and recorded, with machine excavation under archaeological supervision, while more rigorous hand excavations investigated specific areas and aspects of the military features, notably particular or atypical features, or things not seen in the characterisation areas. Two double machine-gun positions were recorded, each with a raised platform in the corner to mount a Vickers machine gun, one based exactly on the wartime military manual, but the other showing adaptation, perhaps based on an instructor's front-line experience.

Other features included possible trench mortar pits and supporting positions used for close defence of trenches by Lewis gunners or Bombers (men trained in use of grenades). Further defences included barbed-wire entanglements, indicated by 'silent' or screw pickets and numerous barbed-wire fragments. They show that, like the Western Front, the Larkhill no man's land was heavily wired, preparing soldiers for the reality of the battlefield.

The presence of unexploded ordnance on the site, including within backfill materials, meant that all excavation and monitoring was undertaken in close co-operation with specialists, who screened all areas in advance of archaeological works. Significant numbers of grenades and both blank and live cartridge cases, further products of extensive and realistic training, were recovered. Also discovered were dumped tins, including corned beef (the staple of British troops) and sardines, and Camp coffee and brown-sauce bottles. These are all similarly found in trenches on the Western Front and show that troops were spending days and nights in the Larkhill trenches, learning the routine necessary to garrison trenches on the battlefield. Smoking paraphernalia, sweet tins and a brazier made from a bucket all showed the methods employed by troops to ease hardship and discomfort. >>



S.14013

21, 22 & 23 CAMPS, LARKHILL.

Above: First World War hutted camps at Larkhill. Courtesy W D Cocroft

Right: A drone photograph showing infilled trenches and square-island traverses. © Wessex Archaeology/WYG



Recording below-ground features

Subterranean remains were initially identified from an area of collapse, with the subsequent discovery of an entrance at the end of one of the saps. This led to an incline heading underground, replicating the wartime military manuals. While dugouts had been anticipated, the more complex tunnel systems were unexpected as mining was thought to have been specialist work, with training given elsewhere. The extent of the underground workings was unknown and had implications for construction, with the potential for voids and collapse, so it was essential to identify their depth and extent. At the same time, the remains presented previously unexpected opportunities for archaeological research. Flint bands in the chalk inhibited use of ground-penetrating radar, so other techniques were employed, including resistivity survey, stitch drilling from known points within identified tunnels and CCTV, used to identify the direction of travel.

The unstable nature of the chalk and the possible presence of unexploded ordnance meant that physical access was not an option. However, the presence of the tunnels beneath the proposed development meant that they were to be removed as part of construction. As a result, laser scanning was used extensively to record underground features, enabling both accurate recording and a virtual-reality walk-through of the tunnels. The remains included tunnels connecting different trenches, as well as a network of galleries and listening posts connected to training in mine warfare, in which soldiers tried to identify enemy activity underground.

Graffiti was identified throughout the tunnels and included over a hundred names, often accompanied by the individuals' Army unit or hometown. There were also messages, including one from the Halls brothers, who recorded themselves as 'Semper Fidelis'. Fourteen Australian soldiers recorded their names and their specialist role as Bombers; one of their number, L.C. Weathers, won a Victoria Cross in September 1918 for attacking a German position with grenades, implementing his training from Larkhill. Each name provided an instant link to the individuals, but also helped give relative dates to tunnel lengths and to determine which units were using the trench system. The historical records for training are scant, so the ability to place men and units within the Larkhill trenches at particular periods increases understanding

of the formation of the British Imperial forces during the First World War.

Assessing the significance of the landscape

While these training works fit within a recognised class of monument, their extent, the range of features identified and the evidence of change and adaptation through the war give them a particular significance. Those directing training had clearly sought a high level of authenticity at Larkhill, intended to prepare troops for the conditions at the Front. Artefacts showed that the Larkhill trenches were not simply an exercise in digging: food tins and ordnance demonstrate that these trenches were regularly inhabited, with active combat training taking place. As such, the trenches belie the popular myth of 'futility', with untrained troops being despatched to certain death. The authenticity of training also extended underground, where men learned not only how to dig, but also how to prosecute the 'silent war' of tunnels and mines. The Larkhill trenches provided an authentic training experience, and served to militarise the landscape as effectively as any trenches in France or Belgium.

The excavation of the trenches during the centenary of the First World War added poignancy to the fieldwork, for the field team, most of whom were of similar age to the soldiers themselves, for members of the local community and for the clients, with their military backgrounds and associations. On 1 July 2016, members of the garrison, project staff, and children from Larkhill School assembled on a stripped area of trenches to commemorate the first day of the Battle of the Somme. This act of remembrance reinforced the meaning of the Larkhill trenches, something transcending their utilitarian origins. Interest in the excavation, from the service community, from those working on and interested in the First World War, and from anyone who may have had forebears training on the site, led to many site visits and international media reports. Perhaps the artefacts and names reminded the public that the men who trained here ate toffees, felt the cold and liked a smoke, or it may be that the scale of training surprised them. For today's soldiers, however, it was clear that there was a strong notion of kinship between the men of Larkhill then and now.

Acknowledgements

The Larkhill project was undertaken by Wessex Archaeology and managed by WYG for Defence



Above: Remembrance ceremony, 1 July 2016, marking the centenary of the start of the Battle of the Somme.
© Rosemary Meeke/Drumbeat

Infrastructure Organisation, with Wiltshire Council Archaeology Service providing professional oversight. Bactec/Dynasafe provided UXO cover, and Gable FM, Cundall and Sirius provided underground recording ■

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Martin managed the works at Larkhill and Bulford Service Family Accommodation for WYG. He is author of the Historic England thematic study on First World War Trenches in England and contributed to the Council for British Archaeology volume *The Home Front in Britain* (2015).

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THE HOME FRONT IN BRITAIN 1914-18

AN ARCHAEOLOGICAL
HANDBOOK

Edited by Catrina Appleby, Wayne Cocroft
and John Schofield

Recording the Home Front Legacy

Equipping volunteers to record the Home Front legacy.

The Home Front Legacy project coordinated by the Council for British Archaeology (CBA) and principally funded by Historic England commemorated the First World War centenary by helping volunteers identify and map the remains of the Home Front across the UK.

Inspiration for the project came in part from the CBA's [Defence of Britain project](#) which ran from 1995-2001 recording the militarised landscape of the UK and identifying a significant number of First World War remains. Building on this, the Home Front Legacy project aimed to record not only the military remains but also the broad variety of other sites associated with the period such as public spaces, allotments and village halls that were utilised to support the war effort.

The project website and social media played an important role

in showcasing the types of site that could be recorded through a range of case studies and blogs. Twitter proved a key platform for connecting with projects researching the Home Front, while a successful partnership with the Imperial War Museum's [Lives of the First World War project](#) enabled promotion of activities across social media to develop connections between places and people.

Running over four years, the project developed a variety of approaches to encourage individuals of all ages and backgrounds to get involved. These included an accessible online recording app, workshops and a suite of learning resources for young people. Over the course of the project almost 5,000 sites have been recorded, many of which will be significant new additions to the archaeological record. >>

Above: The Home Front in Britain 1914-18: An Archaeological Handbook. © Council for British Archaeology

Community-led recording

A core aim of Home Front Legacy has been to encourage people to participate in the discovery and recording of the First World War Home Front in their local area. To make this as accessible as possible an online recording app was developed accompanied by a site recording guide which provided all the information needed to discover, research and record a site. Alongside details regarding

the sites' purpose, location and period of use, recorders were also encouraged to upload associated photos and documents and to complete a condition survey. At the close of the app on 3 August 2018, 4,877 sites had been recorded across the UK; this number is set to rise above 5,000 once the final contributions have been uploaded.

To help inspire potential recorders, the CBA's practical handbook *The*

Home Front in Britain 1914-18: An Archaeological Handbook was published in 2015. This has been an invaluable starting point for many contributors, providing a comprehensive guide to the wide variety of sites that survive and inspiring recorders to investigate similar sites in their local area. The guide also acted as a companion to two phases of training workshops. The first, in 2015, focused on the CBA's network of regional groups,

with workshops taking place in Waltham Abbey, Durham, Sheffield, Worcester, Manchester, Taunton and Winchester.

In 2017-18 a second phase of workshops was developed in partnership with [Living Legacies](#), an AHRC First World War Engagement Centre based at Queen's University, Belfast, which provides support and expertise to community projects researching

the First World War across the UK. These workshops, held in Duxford, Stirling, Swansea and Belfast, brought together members of new and established First World War projects, youth and community groups, heritage professionals and interested individuals. Each event provided training on using the Home Front Legacy recording app and learning resources and outlined the support available from Living Legacies 1914-18. There

was also information on funding opportunities from the Heritage Lottery Fund and an introduction to local sites and projects. Collaborative workshops have been undertaken with CITIZAN and the East Coast War Channels project. These additional workshops have helped Home Front Legacy reach a wider audience and share expertise with other archaeological site-recording projects. >>

At the close of the app on 3 August 2018, 4,877 sites had been recorded across the UK

Workshops provided training on using the Home Front Legacy recording app and learning resources



Above left: Workshop participants discovering surviving First World War buildings at the Imperial War Museum Duxford. © Council for British Archaeology



Above right: Grimsby Bus Depot, built out of former RNAS side-opening hangers from the nearby RNAS Killingholme. © Dr Antony Firth

Over the last four years, a number of groups and individuals have made significant contributions to the project. Celebrated as Home Front Legacy Champions, they may have recorded a large >> number of sites or have helped others to take part in the project by providing inspiration and training. For example, members of the Sheffield branch of the Young Archaeologists' Club teamed up with Archaeosoup to produce a

series of training videos to help other young people learn about [archaeological field recording](#).

A suite of learning resources provided further opportunities for young people to engage in the story of the First World War Home Front. Produced by cartoonist Dave Chisholm, these learning resources were designed to enable Key Stage 3 school groups, Young Archaeologists' Club groups, and

youth groups engage with the First World War Home Front and record sites through Home Front Legacy. The resources consist of a series of five illustrated Home Front scenes, depicting activity and common sites of the First World War Home Front. The illustrations provide a fun introduction to the Home Front and allow the investigation of the range of sites that could be recorded through Home Front Legacy. The

illustrations are accompanied by a series of clue cards and story cards that encourage further learning through the investigation of the illustrated scenes, using the cards to investigate many of the activities and sites presented within the illustrations.

Twelve session plans have been provided to allow teachers and Young Archaeologists' Club leaders to conduct a wide range

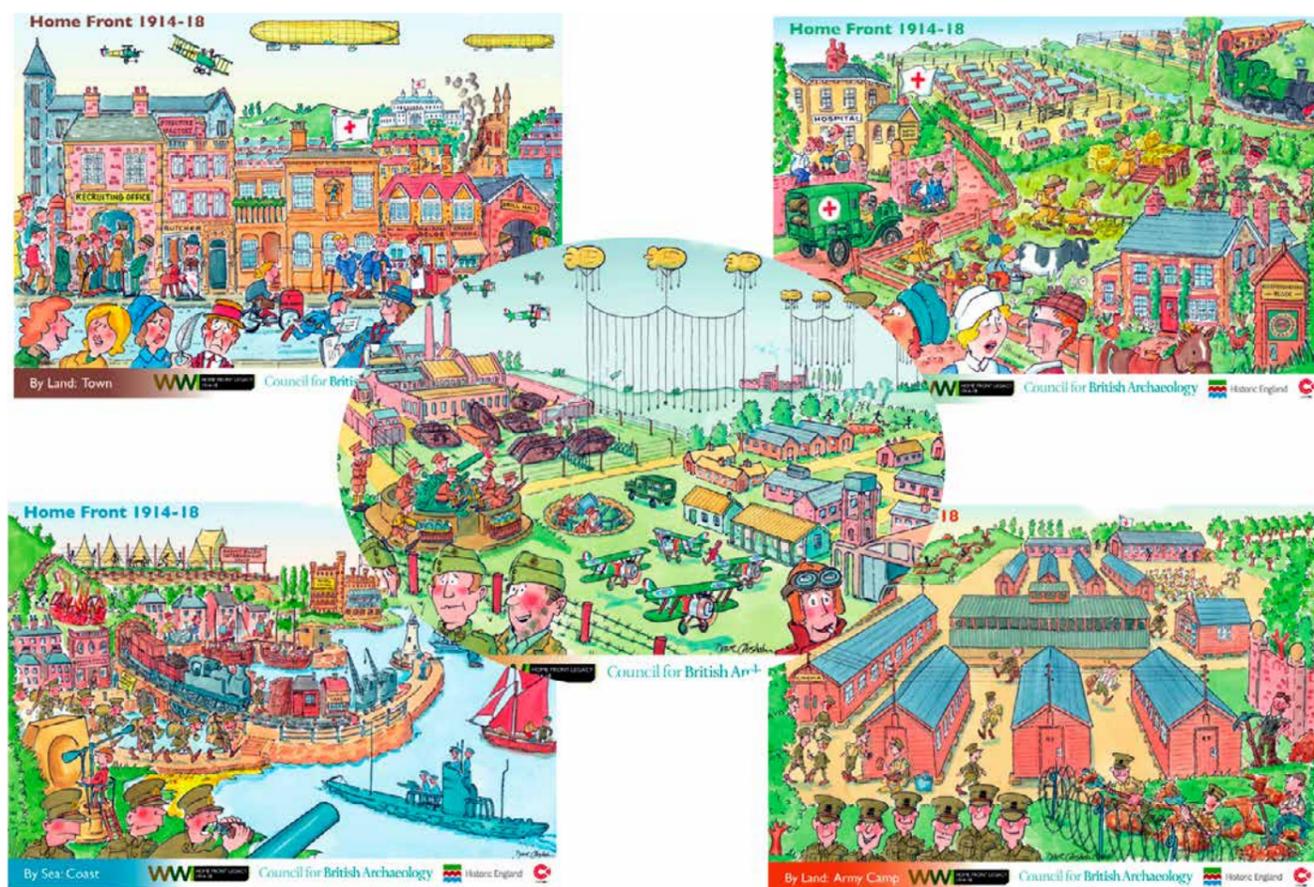
of activities focussing on the Home Front. These session plans cover an introduction to archaeology and to recording sites with the recording app, through to the role of women on the Home Front and First World War material culture.

The resources also include a site recording guide developed to teach archaeological recording techniques to a younger audience.

Project legacy

The final hundred days of the Home Front Legacy project, leading up to Armistice Day on 11 November 2018, have provided an important opportunity to tell the story of the project. During this period the project website and social media will be showcasing some of the most interesting, unusual and most recorded site types, highlighting the efforts of our Champions, and, crucially, sharing information on how >>

A suite of learning resources was designed to enable Key Stage 3 school groups, Young Archaeologists' Club groups, and youth groups engage with the First World War Home Front



Above left: Illustrations by Dave Chisholm from the Home Front Legacy learning resources. © Dave Chisholm



Above right: Participants at the Belfast workshop exploring a First World War handling collection. © Council for British Archaeology

individuals can still record new sites and share the information with their local Historic Environment Service.

The thousands of sites recorded during the project contribute substantially to the knowledge and understanding of the First World War Home Front, and all of the sites added to the online recording app will be archived and freely accessible via the [Archaeology Data Service](#). Consultation with local Historic Environment Services across the

UK at the beginning of the project ensured that the recording app was developed to facilitate data sharing, and the new knowledge captured within the project will form part of the archaeological record, leading to enhanced protection for many of these sites, particularly in relation to future development proposals. The learning resources will also remain available, enabling teachers and youth groups to continue to use them when developing First World War activities.

Many of the individuals who have contributed to the project via the site recording app will have been recording an archaeological site or feature for the first time. The skills learnt during this process are all transferrable and it is hoped that one of the legacies of the project will be their continued interest and participation in archaeology as individuals and through their involvement with local groups and societies ■

The thousands of sites recorded during the project contribute substantially to the knowledge and understanding of the First World War Home Front



Above: Members of Sheffield Young Archaeologists' Club recording a First World War accommodation hut. © Council for British Archaeology

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Further reading

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War memorials: discovery and engagement

Partnership working keeps the memory of the First World War alive in local communities.

The war memorial has become one of the most familiar symbols of remembrance. Found in almost every town and village, we have become so accustomed to their presence that it is easy for them to go unnoticed. As Robert Musil, the Austrian philosopher, declared, 'there is nothing in this world as invisible as a monument.' But the centenary of the First World War and its focus on the conflict's unprecedented loss of life has brought these monuments back into focus.

Through the First World War Memorials Programme, Historic England has been working in partnership with Civic Voice, Imperial War Museums (IWM) and War Memorials Trust to help communities and school children engage with and explore their local war memorial heritage. Throughout the centenary period the partners have been working together with the public and students to discover both the stories behind the nation's war memorials and the role that we can all play in their future protection. >>

Helping volunteers to explore their local heritage

Civic Voice has held almost 200 workshops with civic societies, universities and community groups to help people care for and safeguard their local war memorials by undertaking condition surveys and sharing their results with War Memorials Trust. For the first time in such a large-scale national project, volunteers were also invited to submit their local war memorials for inclusion on the National Heritage List for England (NHLE).

The programme's focus on all First World War memorials, not just those that are well known or sculpturally significant, has resulted in a host of new discoveries about previously overlooked commemorations. University of Birmingham student

Coralie Acheson researched over forty war memorials and successfully applied for them to be added to the NHLE. These included the monument in the tiny village of West Keal in Lincolnshire: here it was discovered that the memorial was designed by Sir John Ninian Comper and includes a sculpture by William Drinkwater Gough. Coralie's research also revealed that Keswick War Memorial in Cumbria contained significant sculptural elements. The monument, which was unveiled in a ceremony on 21 May 1922, was sculpted by Francis Derwent Wood, who also worked on the iconic Machine Gun Corps Memorial in Hyde Park, London.

In addition to researching local war memorials, Civic Voice has also been working to help communities

engage in their long-term care by carrying out condition surveys. These are simple conservation surveys that involve visiting a war monument and answering a set of questions about its state of preservation: the results can be uploaded onto [War Memorials Online](#). Through these surveys it has been discovered that six per cent of war memorials can be considered in poor condition and one per cent as in very bad condition. Large-scale community engagement in this way allows the condition of the UK's war memorials to be monitored and for preventative action to be undertaken if needed. Together with protection through listing, this ensures that monuments can continue to stand as fitting tributes to the nation's war dead for many years to come.

Engaging young people in their local history

Assessing the condition of memorials, undertaking necessary repairs and protecting free-standing monuments through listing are all vital for their long-term sustainability. Yet equally important is ensuring that the next generation understand the significance of memorials and how to care for them. Through the First World War Memorials Programme, Historic England's Heritage Schools Managers and War Memorials Trust Learning Officers have worked with schools to teach students about the history and significance of memorials and to help them research the lives of those listed on their local examples. Some students even went on to make films about war memorials or imagined narratives for those inscribed on them. At the time of their construction, many >>

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Above left: Volunteers attending a Civic Voice Workshop assess the condition of Leamington Spa War Memorial. © Civic Voice



Above centre: Students from John Randall Primary School near Telford learn about the centenary of the First World War and its memorials. © Historic England, Lucy Millson-Watkins



Above right: Pupils from Moat Community College in Leicester filming a First World War film at their local war memorial. © Historic England



Left: Students from John Randall Primary School assessing the condition of their local war memorial. © Historic England, Lucy Millson-Watkins



Right: Participants at an 'Engaging Young People in Heritage Workshop' in Birmingham share their experiences. © Historic England, Lucy Millson-Watkins

Workshops brought together community groups and researchers who wanted to share their knowledge

monuments were the heart of community life. But over time, as people with familial connections have died or moved away, the stories have been lost or are known only to family members. When pupils from Hackforth and Hornby Church of England Primary School in North Yorkshire carried out research into their local church war memorial they discovered that there were descendants of those listed on the memorial still living in the village. These descendants came into the school to share their memories with the children and to ensure that their stories were passed on to the next generation.

After researching the lives behind the names, some students went on to learn about what life must have been like on the home front during the First World War. Pupils from Waterville Primary School in Tyne and Wear researched the impact of the war on their community by looking at war memorials, military records and a range of artefacts, including letters written to and from soldiers serving on the front line. After completing their research, they wrote a play with their class teacher, based on what they had learnt about the war, and created a character called James through which they reimagined the experience of joining up for the war and the effect that this had on his friends and family.

Whilst learning about the history of the memorials, students were also taught that they too can play an important role in their future by carrying out condition surveys and by applying to protect them through listing. By engaging with the physical structure, students were able to identify whether or not it was in good condition and if it needed any repairs, thus helping to preserve it for future generations. One student commented:

'I think it is important to look after memorials because they are an important part of our heritage. With them being there we can pay our respects for the soldiers who gave their today for our tomorrow.' Edward Y6

Throughout the programme it was realised that it was not only schools which wanted to engage young people in heritage in this way. Many groups that had carried out research into memorials were unsure how they could share their findings with a younger audience. In response, the First World War Memorials Programme ran a series of 'Engaging Young People in Heritage' workshops. These workshops brought together community groups and researchers who had been working on war memorials and wanted to share their knowledge.

Attendees learned how best to approach schools and youth groups and how to make their research accessible to a younger audience. The workshops also gave them the opportunity to learn directly from those who had already run successful projects.

Co-ordinating the research findings

For all of these activities to take place it is vital that communities, students and custodians have access to relevant information. Through the First World War Memorials Programme, Historic England has been working with IWM and War Memorials Trust to make information as accessible as possible. There is now a central location, the IWM's War Memorials Register, which not only provides historical information on a monument but also links directly to War Memorials Online, which describes its condition and, if it is listed, gives access to the list entry on the appropriate national heritage website. IWM's War Memorials Register also holds a searchable database of over one million names recorded on memorials, allowing individuals to find where their family members are commemorated. Through all of these initiatives, the First World War Memorials Programme has been working to engage as many people as possible with their local monument and to ensure that they are no longer passed by unnoticed ■

The author

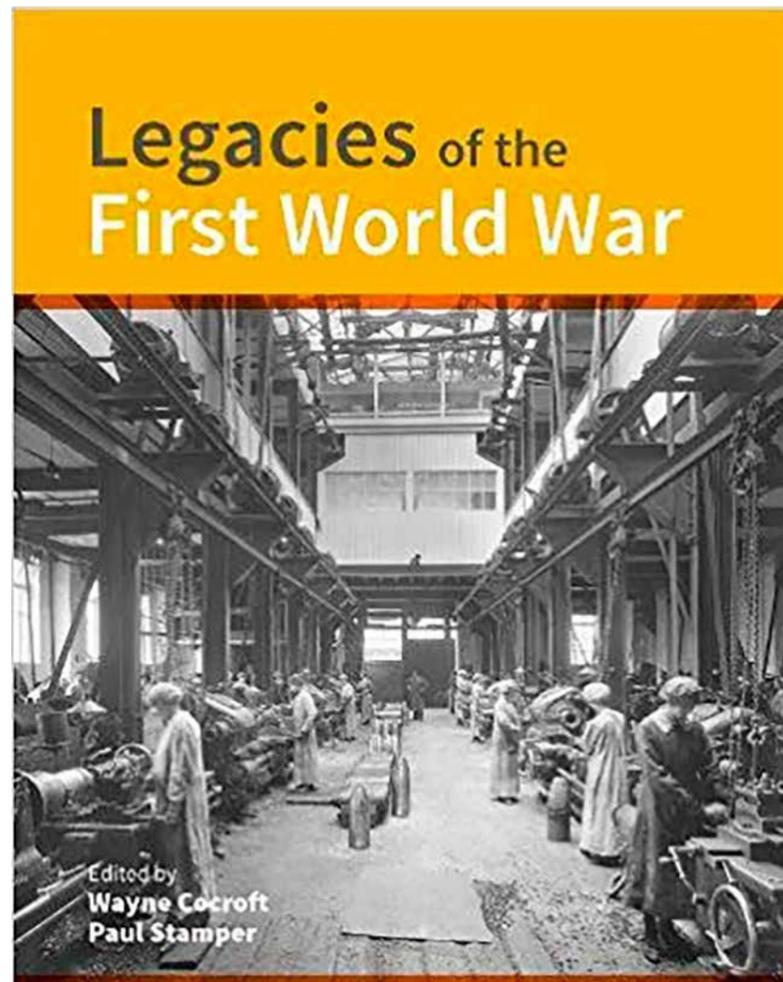
Emma Login
First World War Memorials Programme Manager with Historic England.



Emma joined Historic England in 2016 as the First World War Memorials Programme Manager. Before this she worked as a heritage consultant on 'Landscapes of Life', an exhibition on Remembrance and war memorials at the National Memorial Arboretum. Emma studied at the University of Birmingham where, in 2015, she was awarded her Ph.D. from the Ironbridge Institute of Cultural Heritage. Her research explored processes of war memorial construction and her thesis, 'Set in Stone? War Memorialisation as a Long-Term and Continuing Process in the UK, France and the USA', was published in 2016 by Archaeopress.

HISTORIC ENGLAND PUBLICATIONS

In this edition of *Historic England Research* we look at two titles exploring legacies of the First World War. The physical legacies of the home front are examined in our new edited collection *Legacies of the First World War*, where experts examine the material remains of war on the landscape, on buildings, on the coast, in memorials and on the seabed. *We Die Like Brothers* tells the haunting story of the sinking of the SS *Mendi* in 1917. The physical legacy in the form of the wreck is explored but the book also explains how the cultural and political legacies of this tragic shipwreck had far-reaching consequences, both in England and South Africa. To buy these or any Historic England title visit our [online bookshop](#) and use discount code **HERES18** to receive 20% discount.



Legacies of the First World War: *Building for Total War 1914-18* Wayne Cocroft and Paul Stamper

The First World War has been described as the first total war, a conflict in which a country's people and resources were harnessed towards final victory. Between 2014 and 2018, Historic England set out to uncover and study the physical remains left across England by the First World War.

The range of what was discovered is astonishing, reflecting how the home front became as important as the battlefield. It was the place to train and equip new armies, to manufacture armaments, to treat the wounded and to grow more food. As millions of men joined the armed forces, women entered the workforce in munitions factories and as tram and bus conductors and farm workers.

Archaeological and architectural remains can be found of practice trench lines, munitions works, government factories, army and prisoner of war camps, airfields and airship stations. But England was also drawn into the fighting as German warships and submarines bombarded coastal towns, and Zeppelin airships and later bomber aircraft brought death from the sky. The threat of invasion saw the construction of defences down the east and south coasts. Ships and smaller vessels were lost to mines, torpedoes and gunfire, and on the seabed work is beginning to explore the wrecks from this almost forgotten battlefield.

This new book reveals how, a century later, many traces of this great endeavour survive.

£30.00 : September 2018 : 978-1-84802-288-1: Hardback : 256pp : 219x276mm : 300 illustrations

<https://retail.historicenglandservices.org.uk/legacies-of-the-first-world-war.html>

**We Die Like Brothers:
The Sinking of the SS Mendi**
John Gribble and Graham Scott

The SS *Mendi* is a wreck site off the Isle of Wight under the protection of Historic England. Nearly 650 men, mostly from the South African Native Labour Corps (SANLC), lost their lives in February 1917 following a collision in fog as they travelled to serve as labourers on the Western Front, in one of the largest single losses of life during the conflict.

The loss of the SS *Mendi* occupies a special place in South African military history. Prevented from being trained as fighting troops by their own government, the men of the SANLC hoped that their contribution to the war effort would lead to greater civil rights and economic opportunities in the new white-ruled nation of South Africa after the war. These hopes proved unfounded, and the SS *Mendi* became a focus of black resistance before and during the Apartheid era in South Africa.

One hundred years on, the wreck of the SS *Mendi* is a physical symbol of black South Africans' long fight for social and political justice and equality and is one of a very select group of historic shipwrecks from which contemporary political and social meaning can be drawn, and whose loss has rippled

forward in time to influence later events; a loss that is now an important part of the story of a new 'rainbow nation'.

The wreck of the SS *Mendi* is now recognised as one of England's most important First World War heritage assets and the wreck site is listed under the Protection of Military Remains Act. New archaeological investigation has provided real and direct information about the wreck for the first time.

The loss of the SS *Mendi* is used to highlight the story of the SANLC and other labour corps as well as the wider treatment of British imperial subjects in wartime.

£17.99 : February 2017 : 978-1-84802-369-7: Hardback : 200pp : 140x166mm : 74 illustrations

<https://retail.historicenglandservices.org.uk/we-die-like-brothers.html>

