Mud, blood, and green fields beyond: Exercise Joan of Arc, Bullecourt 2017

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Archaeological Excavation Report

For DRAC Nord Pas de Calais

Breaking Ground Heritage

Mud, blood, and green fields beyond: Exercise Joan of Arc, Bullecourt 2017

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Fig 10 – Photograph of paint adhering to tank track

SUMMARY

In 2016 an application was made to the Directions régionales des affaires culturelles (DRAC) Nord-Pas-De-Calais for permission to carry out a field excavation at Bullecourt to examine the possible final locations of nine Mark II tanks destroyed on the morning of 11 April 1917 as part of the First Battle of Bullecourt. This work, following geophysical and walkover survey, comprised two 5x5m trenches to try to discover parts of tanks 796 and 797. No elements of the latter were found but several elements of (we presume) 796 were found. In addition, the largely complete remains of two German soldiers were unearthed. This report presents the findings of the team.

RESEARCH OBJECTIVES

The main objectives of the 2017 excavation were to examine two areas of the 1917 Battlefield fought over by the Tank Corps and the Australian Infantry. Excavations focussed on the objectives of the Allied attack and, specifically, on the final stopping points of two of the Mark II tanks; tanks 796 and 797. Broad research questions were:

- Do any elements of the Mark II tanks still survive in the area?
- Does material survive which specifically reflects the activity (fighting) of the first Battle of Bullecourt?
- What is the state of preservation of the battlefield?
- How well do trenches and other battlefield features respond to geophysical prospection, in particular magnetic susceptibility and magnetometry? Is it possible to discern such features in spite of significant soil contamination by metallic debris?
- Can the project provide the first accurate map of the final positions of the Mark II tanks in this battle through all the above methods? How accurate was the historian Charles Bean with his mapping?
- Can any recovered elements be scanned along with those in various museums to produce a composite blueprint?
- Can the artefacts present in museums such as Bullecourt and the Australian War Memorial (AWM) in Canberra be catalogued?
- Are there any traces of either the crater that stopped tank (796), or indeed of traces of the tank itself or was it all removed by post-war metal salvage? Can one even tell this in a 5x5m hole

SCOPE

The aspiration of the team is that this project will last for 4 to 5 years and that the first will consist of a week of survey in the spring and fieldwork on site over a period of up to two weeks in the late

summer, with an on-site team of up to 20 archaeologists and surveyors. It is hoped that during this year it will be possible to carry out a series of areas of geophysical survey in arable fields around Bullecourt, and then on the basis of the results of these surveys, to strip mechanically several small areas for archaeological excavation. In addition several areas of archaeological metal-detector survey will be conducted around potential areas of destroyed tanks. Small scale fieldwork would be conducted on the areas where the nine tanks were destroyed in April 1917 in an attempt to fulfil the research questions detailed within this report. It is acknowledged that many elements of the tanks have already been retrieved for le Musée Jean et Denise Letaille and also for the Australian War Memorial in Canberra amongst other collections.

INTRODUCTION

By the spring of 1917, the German field army had retreated eastwards to a stronger defensive position which became known by the Allies as the 'Hindenburg Line'. The First battle of Bullecourt in April of that year as part of the Arras offensive marked just one attempt to breach this network of trenches and defensive obstacles. The focus of our project was the fate of the tanks engaged in this operation.

HISTORICAL BACKGROUND

In the aftermath of the Somme campaign a number of new tactical ideas were developed. The majority of the debates related to the coordination of artillery barrages and infantry attacks. After the first use of tanks in September 1916 their tactics were also added to the debate. The attack at Bullecourt was potentially revolutionary as it attempted use tanks to crush the enemy's defensive wire rather than by artillery bombardment.

Sixty Mk I and Mk II tanks were allocated for the opening attack of the Arras offensive on 9 Apr 17 (the battles of Arras were the first time that Mk II tanks were used in action). Of these 60, 8 were allocated to the 1st Army, 40 to 3rd Army, and 12 to 5th Army. The 62nd (West Riding) Division was ordered to attack the western side of the village. The 4th Australian Division, part of 1 Anzac Corps, was tasked with attacking the village's eastern side. The 12 tanks would support both attacks.

The Commander of 5th Army, General Gough, was taken by the idea put forward by Major Watson, one of the tank Company Commanders. Watson believed that a large concentration of tanks could move up to the German positions at Bullecourt with infantry following, and that the general confusion of battle would mean that the tanks could advance without an artillery barrage. When they reached the German lines the tanks could cross and destroy the barbed wire with the infantry following behind. Gough was taken by the idea but senior Australian commanders were not. Their two biggest concerns were the sheer lack of time they had to plan the attack and the fact that they did not believe that tanks could move en masse to the Hindenburg Line without being noticed by the Germans.

On April 9th the 1st and 3rd Armies attacked the Germans at Arras and Vimy. The initial attacks were successful and it was partly as a result of this success that Gough brought forward by 24 hours the date for the attack on Bullecourt to April 10th. The plan was for 12 tanks to advance to the east of Bullecourt with men from the 4th Australian Division following on behind. Once the tanks had

breached the Hindenburg Line the Australians would move into the village and take it while the 62nd Division attacked the village from the west.

The attack commenced at 0430 on 10 April despite last minute attempts by the Australians to postpone it. They feared that the plan was too hastily put together and that too many assumptions about the German positions in the Hindenburg Line had been made. The Australians fears proved correct. The tanks got lost advancing to the front which delayed the attack by 30 minutes. At 0500, with the tanks still not in the right place, the attack was postponed for 24 hours. Gough ordered for the same plan to be executed on 11 Apr. Once again some of the tanks were late and fewer than 12 arrived because of mechanical faults. Further, their approach was detected by the Germans. The attack started 15 minutes late and the Australians attacked with just 3 tanks in support.

The attack cost the Australians 3000 men including 1,142 captured. Of the tanks that took part, only one reached Bullecourt and out of a total of 103 men in the tank crews, 52 were killed or wounded.

Bullecourt was a very complex and controversial battle which also included an often forgotten and costly tank action in support of 62nd Division which resulted in many casualties and decorations for the tank crews. The issue of artillery support is a complex one well covered in Falls and Bean. Artillery should have been able to cut the wire since the 106 fuze, a then new impact fuze, had been used with some success to cut the wire prior to the 9 April attack at Arras. A key problem was that unlike the Arras attack the Bullecourt attack support had to be brought up through the countryside devastated by the Germans during their withdrawal. As a result the guns probably could not provide the best possible support hence the need for tanks. A well implemented and thought out artillery barrage could enable infantry to penetrate German defences as demonstrated by 4th and 9th Divisions' attack on 9 April. In this case the artillery plan was conceived by Tudor, a gunner who also came up with the artillery plan for Cambrai which included tanks to crush the wire and eliminate the need for a preliminary barrage and registration.

After the battle it was accepted that Gough's plan, to advance infantry behind tanks through a narrow sector and then fan out east and west along the Hindenburg Line, was sound on paper but that the lack of preparation was a fatal weakness. Although the battle of Bullecourt was a failure from the point of view of tanks, it was also one of those turning points that often prove decisive in the development of new weapons/capabilities. The plan was hastily thought up, poorly developed, and executed in an uncoordinated way. The use of too few tanks in such an unprepared way to some extent vindicated the cries from the Tank Corps (as it would become that summer) that tanks would be best used en masse, in echelon, and with adequate reserves, as laid down in Tank Training Note No 16. After Bullecourt they had the evidence to support their theory.

Lt-Colonel Gareth Davies, also of the Royal Tank Regiment and member of the research team concurs with these thoughts: 'The failure of the tanks at Bullecourt was critical to the development of the tank tactics leading to the victories of Cambrai, Amiens and the subsequent battles'.

Philippe Gorczynski, discoverer of the 'Deborah' and one of the foremost experts on the tanks of the Great War has already assisted our work and felt that "the weakness of the Heavy artillery was the consequence of transportation problems. At Bullecourt, the artillery has done a terrific job and there was an important artillery barrage. The problem was that shells were unable to achieve the breaching of the barbed wire belts. The importance of Bullecourt is also how the tanks were

unjustified blamed and how their reputation was altered. The Australians gave the responsibility of their failure and their losses to the use of tanks as they have put too much hope in the new war weapon .Tanks & Anzac troops had to progress in 1500 yards open ground and by day light before reaching enemy with no surprise for the enemy. It appears also that there were some serious problems of coordination".

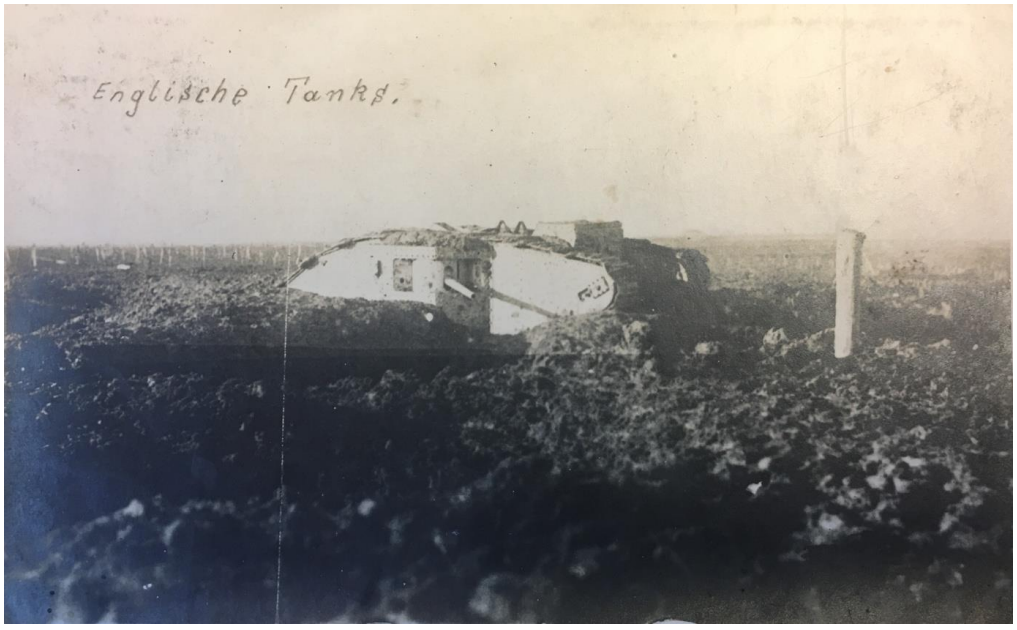
All these historical debates illustrate the importance of Bullecourt and how there is an important academic study to be undertaken. This combined with the relatively unspoilt and contained area of the battlefield, with a small number of tanks to be examined and a series of museum which have a major interest in the Mark II tank make Bullecourt the perfect site for a very important, multi-national and scientific study of a set-piece battle of the Great War.

Major Watson, a tank officer who wrote about the actions of the tanks involved at the battle of Bullecourt wrote the following about the two tanks that this project was endeavouring to locate.

Tank 797 (commanded by 2nd Lt Birkett):

"Birkett went forward at top speed, and, escaping the shells, entered the German trenches, where his guns did great execution.' the tank worked down the trenches towards Bullecourt, followed by the Australians. She was hit twice, and all the crew were wounded, but Birkett went on fighting grimly until his ammunition was exhausted and he himself was badly wounded in the leg. Then at last he turned back, followed industriously by the German gunners. Near the embankment he stopped the tank to take his bearings. As he was climbing out, a shell burst against the side of the tank and wounded him again in the leg. The tank was evacuated. The crew salved what they could, and, helping each other, for they were all wounded, they made their way back painfully to the embankment. Birkett was brought back on a stretcher, and wounded a third time as he lay in the sunken Road outside the dressing station. His tank was hit again and again. Finally it took fire, and was burnt out" (Watson, 2014, 58-59).

Tank 796 (commanded by 2nd Lt Skinner):



"Skinner, after his tank had been towed over the railway embankment by Morris, made straight for Bullecourt, thinking that as the battle had now been in progress for more than two hours the Australians must have fought their way down the trenches into the village. Immediately he entered the village machine-guns played upon his tank, and several of his crew were slightly wounded by the little flakes of metal that fly about inside a Mk I. tank when it is subjected to really concentrated machine-gun fire. No Australians could be seen. Suddenly he came right to the edge of an enormous crater, and as suddenly stopped. He tried to reverse, but he could not change gear. The tank was absolutely motionless. He held out for some time, and then the Germans brought up a gun and began to shell the tank. Against field-guns he was defenceless so long as his tank could not move. His ammunition was nearly exhausted. There were no signs of the Australians or of British troops. He decided quite properly to withdraw. With great skill he evacuated his crew, taking his guns with him and the little ammunition that remained. Slowly and carefully they worked their way back, and reached the railway embankment without further casualty" (Ibid, 59).

Our excavation trenches were located over the final noted points of these two tanks; Trench 1 over the possible area of tank 796, and Trench 2 over the possible area of tank 797.

LOCATION AND TOPOGRAPHY

The site is located within the Commune of Bullecourt, a small town to the south of Arras in the Pas-de-Calais Departement of Northern France. The excavation trenches are located to the south east of the village, north of the railway embankment but south of the sunken lane which was present in 1917. The excavation trenches fall within cadastral plan parcels numbers 16, 17 and 18 and at the time of this report were in the ownership of Mnr Delambre (Trench 1) and Mnr Guerle (Trench 2).

Trench 1 lies on higher ground at the edge of the village – some 92.5m above sea level whilst Trench 2 is on slightly lower ground c 90m above sea level in the Vallée des Fourches and would have been exposed to fire from the Hindenburg Line to the north. Trench 1 lies within a field of permanent pasture whist Trench 2 is part of an agricultural holding, currently down to a pea crop. The local

geology consists of clay 'Liman' overlying chalk, although only clay was encountered in the course of the excavations of 2017, with no deep features being excavated.

Trench	Tank	Commune	Groupe	Parcelle	Grille de Réf (Centre)	Propriétaire
1	796	Bullecourt	AB	58	31N 481840 5539980	Mnr Thierry Delambre, 13 Rue de Fontaine, 62128 CHERISY
2	797	Bullecourt	ZE	16	31N 481090 5540890	Mnr Didier Guerle, Rue de l'école, 62128 Bullecourt

AIMS AND OBJECTIVES

The main objectives for the excavations of June 2017 were to place two 5x5m trenches over the areas where the team believed the best chances for locating evidence for the fate of the tanks of 2nd Lt Birkett (tank 797) and 2nd Lt Skinner (796).

METHODOLOGY

Prior to any excavation work, and as part of the application sent to DRAC for the permission to dig, the project undertook desktop assessment of the area and subsequent non-intrusive survey work (Masters, 2016 unpublished). This work consisted initially of a cartographic study not only of published maps (Bean 1941, Kendall 2010) but also examination of maps held by the Imperial War Museum (London) and the Australian War Memorial (Canberra). In addition to this assessment, aerial photographic work was undertaken by Dr Birger Stichelbaut of the University of Ghent, by Nick Yeomans and by the author in order to compare the imagery of 1917 (and later) with written records and accounts. Diaries and contemporary postcards showing the wrecks of tanks 796 and 797 were also scrutinised.

The results of the desktop survey facilitated the subsequent remote sensing and non-intrusive fieldwork accomplished in the autumn of 2016 with the permission of landowners and DRAC. Selected areas were surveyed - with a series of 30mx30m grid squares over which fluxgate gradiometry (magnetometer) was be undertaken. In areas which had been ploughed, the geophysical survey work was augmented with field-walking in the same grid squares and measured surface scatters of war materiel were produced to compare to any geophysical signals (and mapping/air photographic 'hotspots'). This data was correlated in order to produce the excavation strategy proposal to DRAC, with two 5x5m excavation squares proposed.

After having been surveyed, two trenches were opened by the team in June 2017. Trench 1 was stripped by hand with subsequent excavation by tracked mechanical excavator (using a toothless

bucket) to remove topsoil and any overburden down to the level of any archaeological deposits. All subsequent work was undertaken by hand. Trench 2 was stripped by the same machine down to the level of undisturbed subsoil.

Both trenches were planned and recorded in accordance with normal UK practices and as per the permission from DRAC, including the allocation of unique single context numbers to deposits and cuts. Artefacts were catalogued with their contextual associations, and photographed where deemed to be of interest. All artefacts were retained in France.

Human remains were uncovered in Trench 1 and this was reported immediately both to the local Mayoress and also to the French police (who contacted the commonwealth War Graves Commission - CWGC). Work stopped until the latter gave their permission to continue – as per French legal procedures. The human remains were planned at 1:10 and their artefactual association documented. They were then photographed *in situ*. The remains were removed and subsequently collected by the CWGC prior to delivery to the French authorities and ultimately the German War Graves authority; the VDK. These remains can now undergo full pathological assessment prior to their re-interment in a German war cemetery.

All work was supervised by professionally qualified Explosives Ordnance Disposal (EOD) staff that both scanned excavation areas during fieldwork and also removed any potentially dangerous items. The EOD staff, led by Mnr David Moutter as per the application made in 2016, reported all explosive material to the French Demineurs who then collected artefacts for disposal.

The site was visited by Dr Alain Jacques and we were able to demonstrate adherence to the permission afforded by DRAC. This work was under the Autorisation de fouille programmée Permission given by Mnr Marc Drouet Pour le Préfet de la Région Hauts-de-France et par delegation, Le directeur regional des affaires culturelles on the 5 May 2017. Arrêté number 2017-**09**

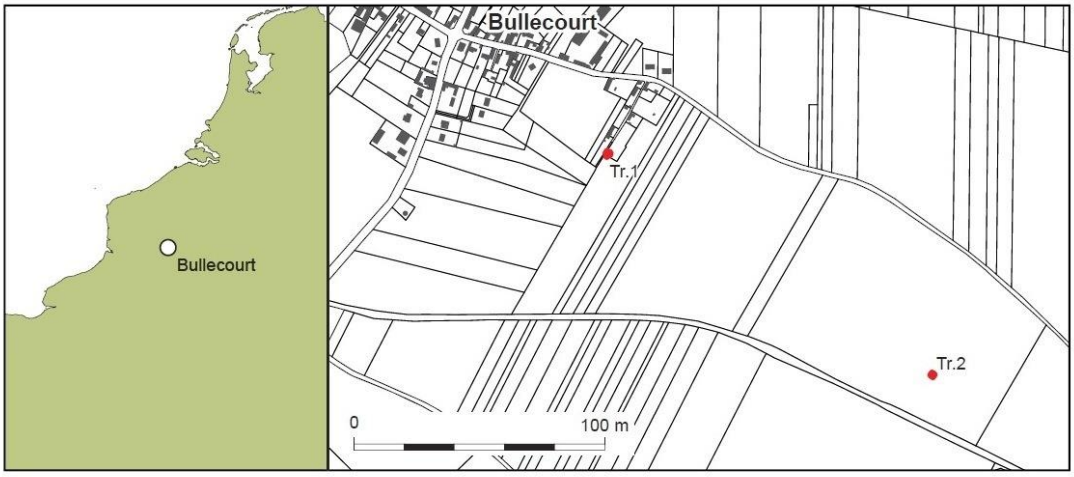
RESULTS

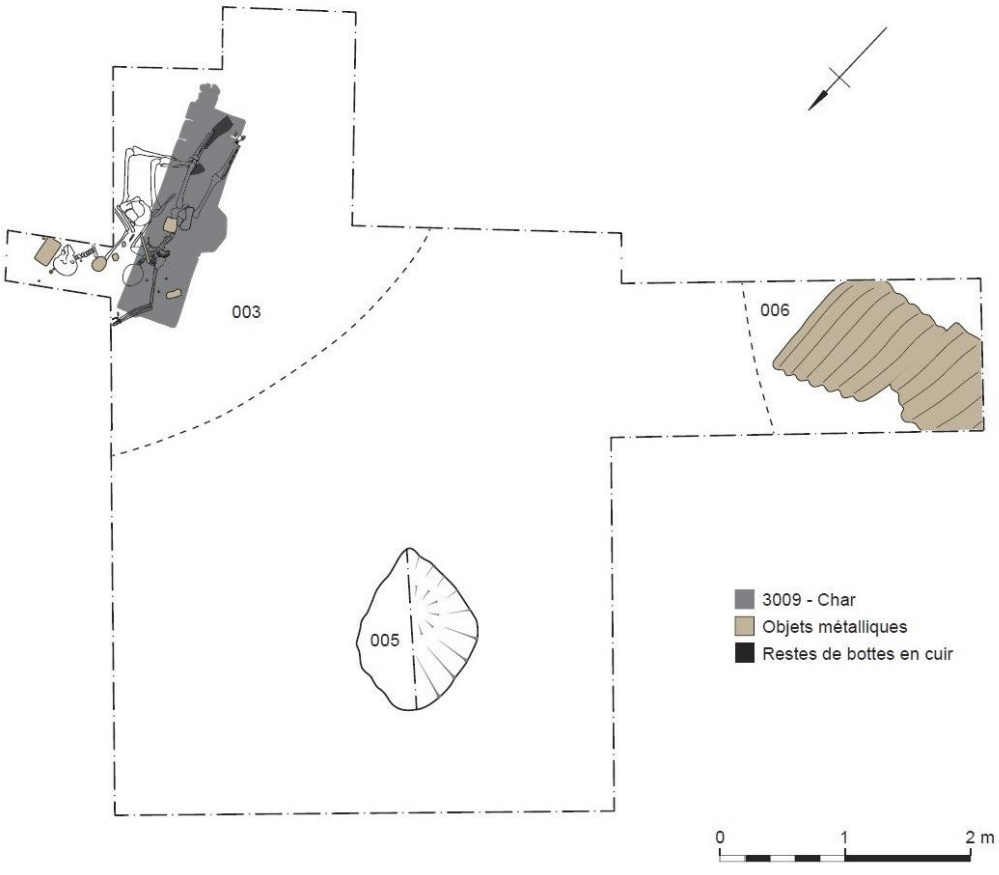
General

Two 5x5 trenches were excavated as shown on Fig 1. Individual features are described in the following sections with artefacts recovered detailed in Appendix 1.

Trench 1

One 5mx5m square was excavated in the pasture field to the immediate south east of the village of Bullecourt, over the potential area of the destruction of Tank 796 and adjacent to 'Bullecourt Avenue' trench. Within this area one small shell crater was observed [005], and a much larger crater (only partially excavated) was also noted [003]. German corrugated iron (known colloquially as 'elephant iron') was seen at the south east of the excavation area but this was left in situ and not lifted. To the north east edge of the excavation area, a segment of tank track was found – this resulted in a small extension of the trench to the eastern edge to facilitate complete recovery and careful excavation of the track. On lifting this track portion, and subsequent trowel cleaning of the area, two sets of human remains were found. A 1x1m extension to the northern baulk of the trench was required to ensure full retrieval of one of these skeletons (skeleton 2). The initial interpretation is that two German soldiers were killed having been using the destroyed tank as part of a machine





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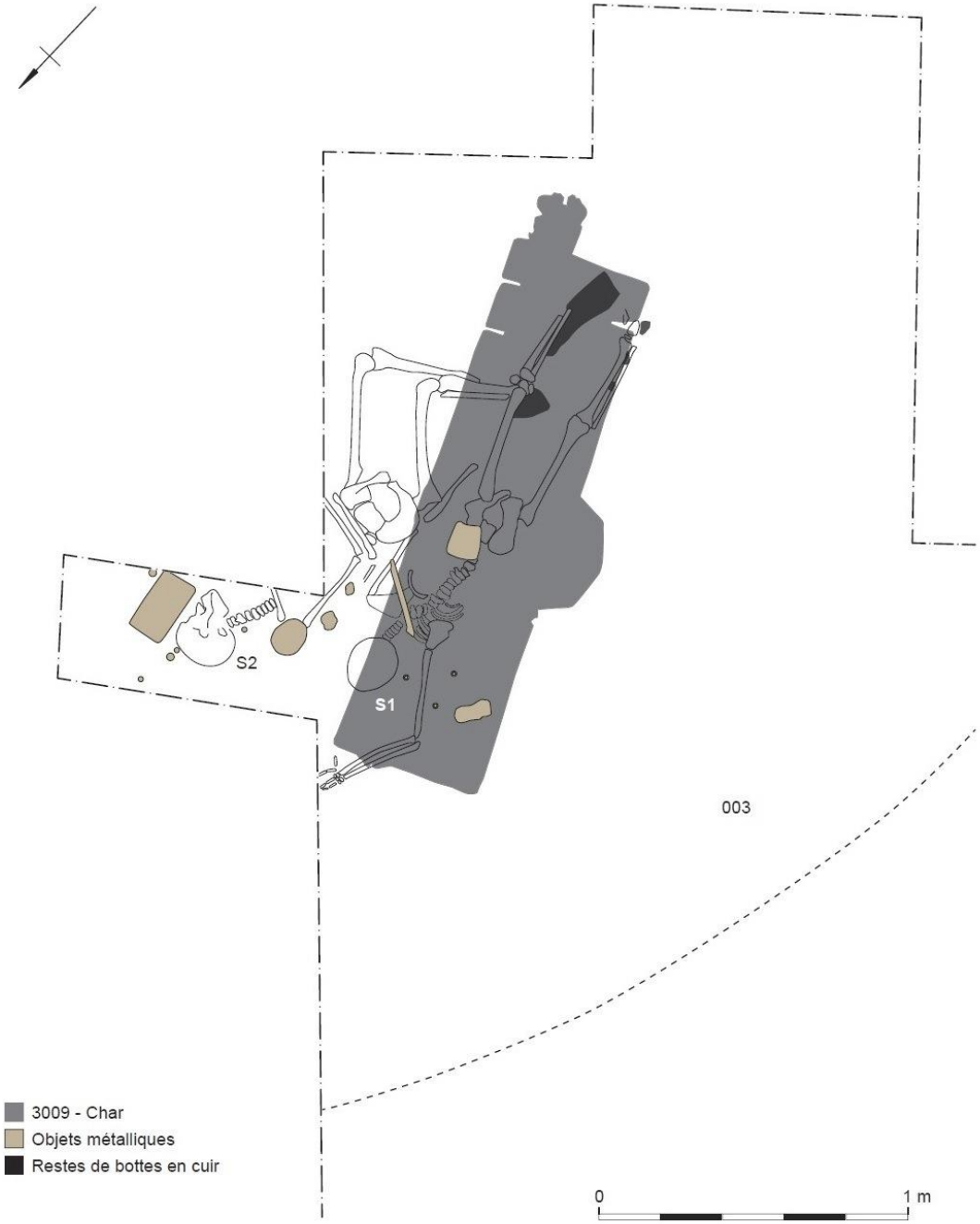
Emplacement et aperçu du tranchée 1 Fig. 1



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Détail de la tranchée 1 Fig. 2

gun shelter, they were then buried in a large crater, with groundsheet(s) placed over them and potentially the tank track. The plans of trench 1 were drawn at 1:20, with the human remains at 1:10. Only one feature, [005], was excavated to complete depth enabling a section drawing at 1:10

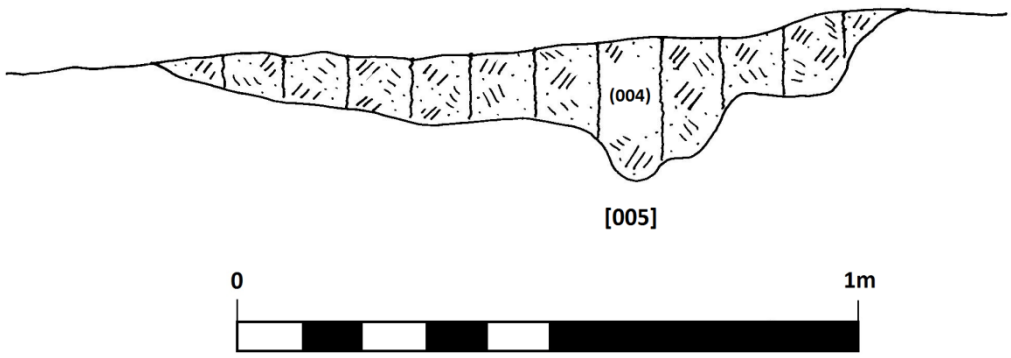

Fig 3 - Shell Crater [005] Tr 1

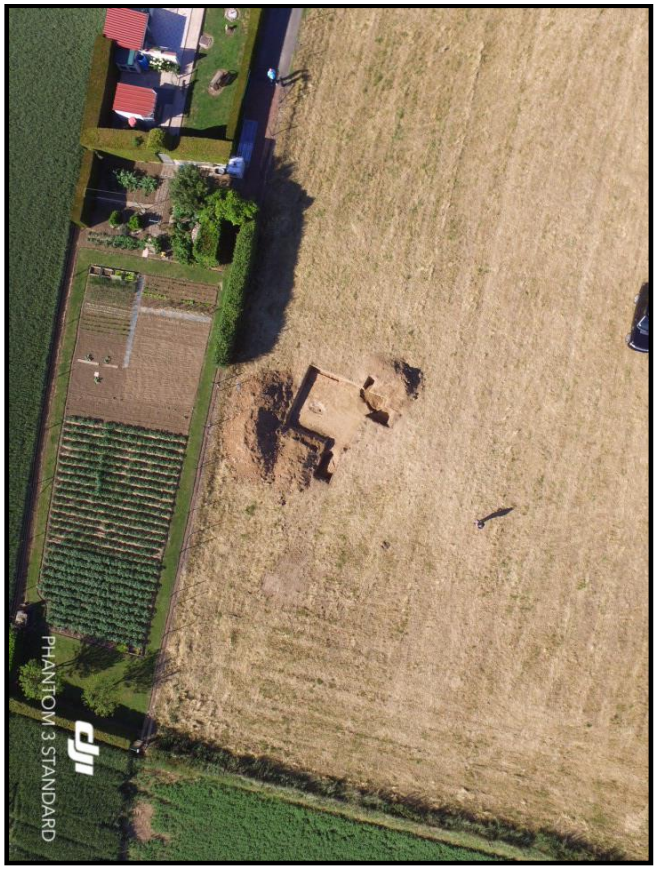

Fig.4 - Aerial Photo of Trench 1 (Philippe Gorczynski)

Fig.5 -Tank Track in Trench 1 (Harvey Mills)

Fig. 6 - Corrugated Iron in Trench 1 (Harvey Mills)

Trench 2

One 5mx5m square was excavated in the arable field just north of the railway embankment, over the potential destruction area of Tank 797 (see Fig 1). Within this area initially no cut features were visible but, after cleaning and weathering, a small shell crater [010] was noted which held a screw picket (presumably the source of the metallic anomaly on metal detection and geophysical surveys), one shrapnel ball, and some small shell fragments (not retained). No evidence of the tank was recovered and the trench was not extended. It is likely that the bulk of this tank was thus retrieved either after the battle or by subsequent investigators. The topsoil was c29cm in depth. Section of [010] not drawn

Fig.7 - Trench 2 after stripping and cleaning (Harvey Mills)

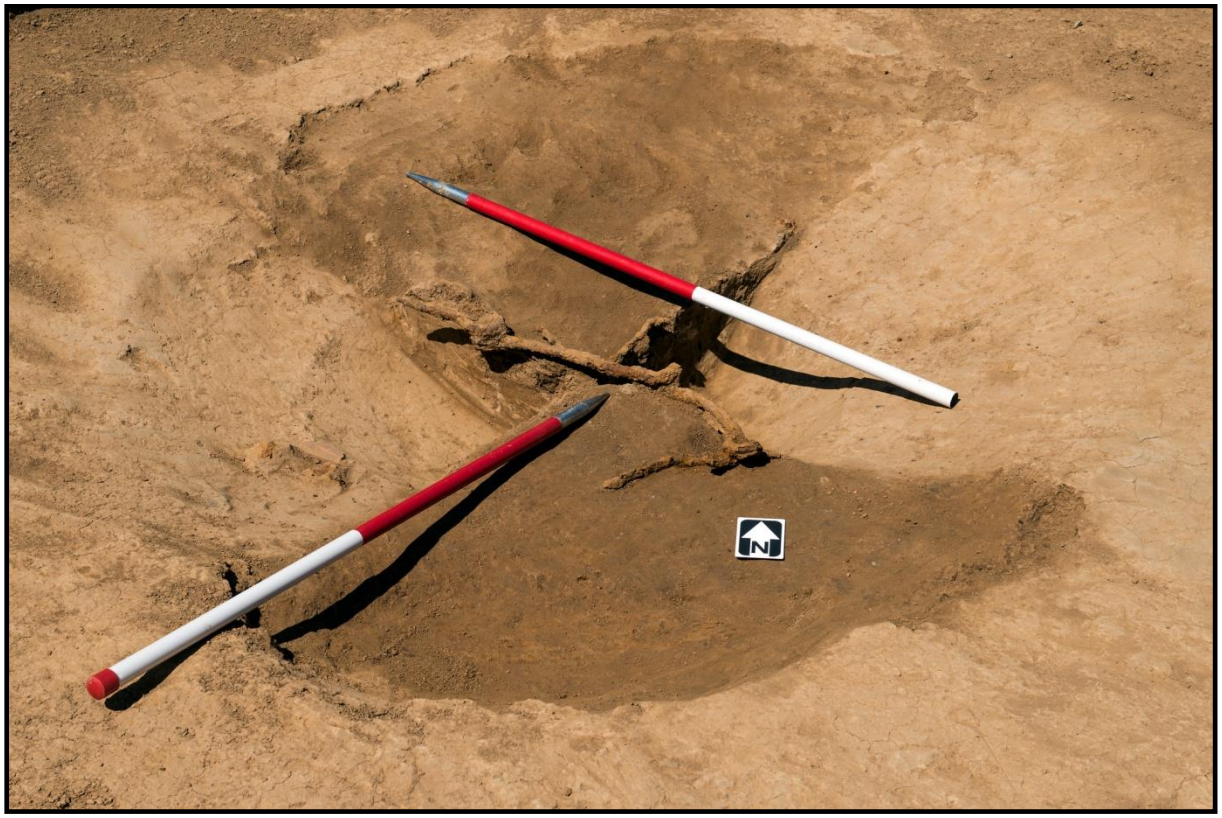

Fig. 8 - Shell crater [010] and screw picket (Harvey Mills)

DISCUSSION

General

Trench 2 yielded nothing relating to tank 797 and perhaps indicated that the main remnants of this vehicle had been retrieved. Trench 1 however provided much more evidence for an armoured vehicle. This excavation area yielded possible evidence for a German troop shelter with substantial corrugated iron sheeting just to the north of this was one small shell crater and the cut of a much larger crater. This held not only a large section of the track of a tank (presumably that of tank 796 given the relatively small number of tanks utilised here over a large area, and that it tied into desktop survey components), but also the remains of two German soldiers. Contemporary maps in the Australian War memorial indicated that the knocked-out remains of tank 796 were subsequently used by the Germans as a machine gun post. The two soldiers found were not Württembergers, the Regiment which were present in the Hindenburg Line facing the Australian and tank attacks of April 1917, but were in fact Prussian infantrymen, at least one of which was of the '2nd' Company of a unit. The two soldiers were placed on the inside edge of a large crater, with groundsheet placed upon them and with the track of a tank over this sheet. It is possible that the track had been used to weigh down the groundsheet and hence ensure the integrity of the burials. Watson's account (above) and other anecdotal reports noted the presence of a large crater which impeded the progress of tank 796 towards the village of Bullecourt and it is possible that the feature in Trench 1 represented part of this entity.

The remains of the tank track included one track grouser or 'spud' intended to give the tracks increased grip and, interestingly, some original paint was present. This paint had a red 'primer' and was dark green in colour (British Racing Green) – it was present on the side of the track which would not have faced the ground surface. The colour was reminiscent of the paint colours utilised by Fosters of Lincoln, manufacturers of these 'male' Mk II tanks, for their traction engines. The track was lying in its correct alignment; with the surfaces that were designed to face the ground doing so.

In addition to the track of the tank, the excavations yielded other components that were or were possibly part of the tank. A small figure-of-eight shaped piece of corroded iron was recovered; this was one link of the drive chain of a First World War tank. A heavy, flat circular item located next to the track may also have been an armoured component though none of the experts on tanks with the team was able to positively identify it. This object should be subjected to XRF assessment to establish its possible nature. A couple of burned-out 6lb shells were found; these were the ammunition for the main armament for the Mk II male tanks and would not have been utilised by other artillery pieces on this battlefield. Furthermore, although they may have originated from several other sources, some components of petrol cans of a type found within tanks were also excavated in Trench 1.

No cut elements of the Hindenburg Line trench system were encountered although the potential for such features surviving in the locality is high. Furthermore if, as seems to be the case, the excavation Trench 1 was sited over the destruction area of Tank 796, there also remains a high potential for other components of this destroyed tank being located nearby, and also for more information on the nature of the large crater to be found.

Although there are many images of the destroyed tanks in German archives and on postcards (indicating that large portions survived this battles and hence could easily have been retrieved post-war as scrap material) the fieldwork has shown that tank components do still survive. The number (and scale) of elements found would indicate that there is a strong likelihood that one can discern a (good) approximate last location for the tanks of 1917 through destroyed elements left in situ and not retrieved post-war.

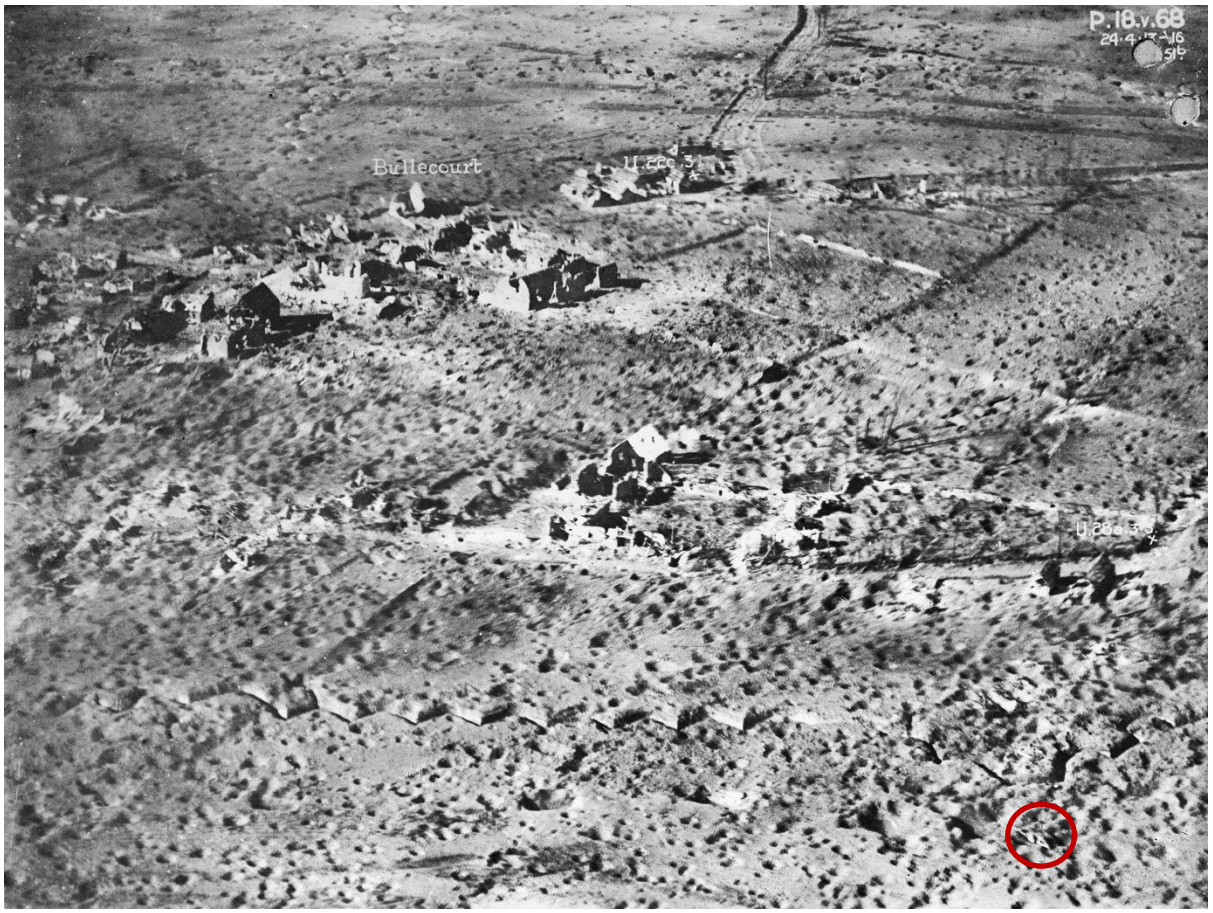

Fig. 9 – Image of the destroyed village of Bullecourt in 1917, and the remains of tank 796 (Australian War Memorial A00664)

Human remains

The remains of two German soldiers provide some evidence for the fierce fighting on this part of the western front. The two men were still wearing their boots and held insignia which indicated that they were probably both Prussian infantrymen. Skeleton 1 had pistol ammunition consistent with having been an officer or (more probably) part of a machine gun team. Skeleton 2 had an epaulette button with a number '2' on it. Both had their respirator tins with them. NO identification discs were present and thus any attempts to identify the men would be dependent on osteological, isotopic (and potential DNA) assessments undertaken on behalf of the VDK. All artefacts associated with the human remains formed part of the archive returned to the VDK.

Skeleton 1 was lying extended and face down, with left arm flexed above his head. Skeleton 2 was lying on his left side. No assessments were made for traumatic injuries as this was left to the VDK. Both skeletons were largely complete. At appeared that they had been tipped into the crater or lay

where they had been killed as neither displayed any degree of formality about their field burial other than the possible presence of a groundsheet (indicated by several metal eyelets) above the bodies.

CONCLUSIONS

This first archaeological permission granted to a study of the archaeology of the First World War in Bullecourt was a great success. Much information relating to the War was recovered from a relatively small excavation trench. The main focus for the endeavours – to consider the tanks of the Great War – met the research requirements. One facet – the recovery of some original paint on the tank track – was particularly exciting. Our views of the tanks of this conflict are sepia-toned or in black and white. Even the surviving tanks in museums have been repainted on several occasions. That this small remnant of colour is an example of the original paint colour of the tank as a whole is a tantalising possibility. Although on the 'interior' or the tank track, the paint is primed and deliberately on the metal and the most likely explanation for its presence is that it was applied in the factory prior to embarkation to France.

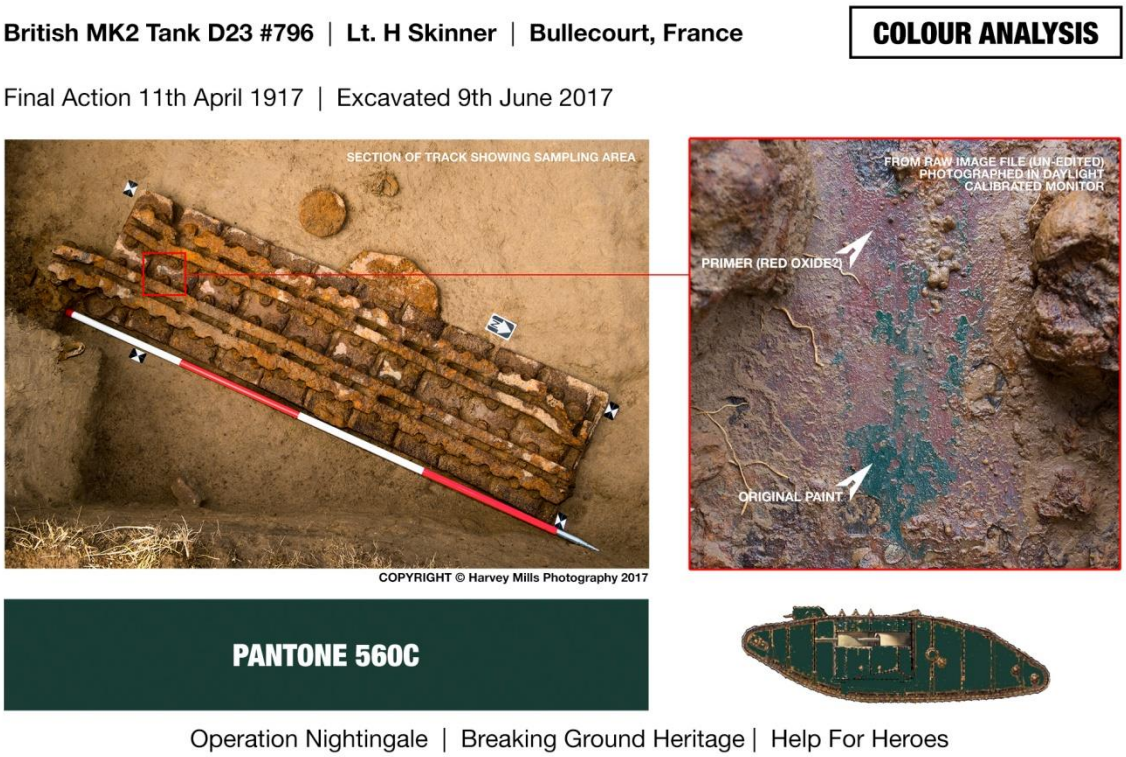

Fig. 10 - Paint adhering to the tank track (Harvey Mills)

Therefore, to answer the research questions that we posed at the start of the project, one can empirically say that there is materiel left behind from the First Battle of Bullecourt – the tank track and even the probable verification of the large crater which impeded tank 796. We also uncovered evidence for later parts of the battle – with the presence of the remains of the two Prussian soldiers.

Geophysical survey was successful in spite of the large amount of metallic contamination of the soil and played a role in the siting of both of the excavation trenches. It was not possible to answer questions on the survival conditions of battlefield as the only cut features encountered, apart from

the potential troop shelter, were shell craters. Future work should be able to discern more – especially with regards the Hindenburg Line. Walkover studies conducted in the autumn of 2016 alongside the field season of 2017 highlighted the fact that much still survives of the conflict landscape here – from railway embankment to sunken lane and with clear surface expression of battlefield components in pasture fields. The material recovered from the ground was in a relatively good condition; the paint remnants on the tank track being a case in point.

The 2017 season recovered good evidence for the location of tank 796 but no results for 797. We should therefore be able to produce a final comparative map of tank positions relative to that of Charles Bean but this must be with the caveat that some of the decisions will be the results of aerial photographic rectification not corroborated by presence still in situ. Already we are able to state that, although roughly accurate, Bean's model can be refined.

Our work intends to scan items and provide models of components for inclusion, potentially, in a Bullecourt Mark II tank plan in association with the Australian War Memorial in Canberra. Whilst this is a long term goal, we have successfully demonstrated the efficacy of photogrammetric survey of components (Photographer Harvey Mills – see link https://sketchfab.com/models/f33f5cce8dc040259f4da46d08d6036d). This could be expanded for all artefacts of tank association. We have catalogued our own findings and are aware that a similar process for the artefacts held in Bullecourt and Canberra (of our of context material) would be a major undertaking.

RECOMMENDATIONS FOR FUTURE WORK

The initial project design was for an examination of the potential locations of the nine tanks destroyed on 11 April 1917. Thus far, two locations have been examined and thus there is potential to consider a further seven vehicles. In addition, the survival of the tank components (and the material visible on old postcards) would suggest that there is huge potential for finding other components of tank 796 and also in establishing more about its final context; the large shell crater which had proved such a major obstacle. Linking these tanks to the defensive architecture of the Hindenburg Line would also be advantageous. All such work would be subject to future approval both of the landowners and also the DRAC. Our project will propose to revisit the pasture field from which the tank track was recovered and to extend our initial trench to the south east, in addition we will look to consider part of the Hindenburg Line which was renamed 'Tank Avenue' by the Allies.

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Australian perspective on events, whilst Rob Schaefer supported research on the German side of the wire.

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Didier Guerle, Thierry Delambre Gladys Watson, all the locals of Bullecourt,

Peter Masters of Cranfield Forensics Institute led the geophysical survey and mapping components of this project.

Alex Sotheran was the main fieldwork supervisor for the programme

Richard Bennett and Breaking Ground Heritage (http://www.breakinggroundheritage.org.uk/) was integral to the success of the project. He provided and organised the project logistics and military veterans

Project Photography was undertaken by Harvey Mills (www.harveymills.com)

All fieldwork was accomplished under the scrutiny of professional Explosives Ordnance Disposal staff – Mr David Moutter and Florian Duchatelle.

The excellent excavation team was composed of archaeologists, Help for Heroes professionals, and military veterans/service personnel: Sarah Ashbridge, David Brown, Peter Cosgrove, Ric Coulson, Kayleigh Hopkins, Mumtahin Islam, Phil Kimber, Peter Masters, Janine Peck, Jack Robson, Carlos Rocha, Matt Smith, and Rob Steele.

Post excavation work included essential input from Wessex archaeology (Will Foster - graphics), and from Alexandra Cauvi (translation).

Something that struck the team during our work in France was the generosity and kindness shown by all the locals of Bullecourt, and also in their interest in our work. They could not have been more helpful. Of course, within this group are those that gave the permission for us to be in their village and on their land. So to the Mayoress - Mme Gladys Watson; to the owner of the resting place of 796 - Mnr Thierry Delambre and of course the inimitable Mnr Didier Guerle the project salutes you.

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APPENDICES

Appendix 1: Finds not with human remains (NB all retained by landowners)

Small-Arms Rounds

SF Number	Quantity	Component	Fired/Unfired	Calibre	Nationality	Year	Context
1	1	Round	UF	7.92	Ger	1913	Topsoil
2	1	Round	UF	7.92	Ger	1915	Topsoil
3	1	Case	F	7.92	Ger	1915	Topsoil
4	1	Case	F	7.92	Ger	1916	Topsoil
5	1	Case	F	7.92	Ger	1916	Topsoil
6	1	Round	UF	.303	Br	1915	Topsoil
7	1	Case	F	7.92	Ger	?	Topsoil
8	1	Round	UF	7.92	Ger	?	Topsoil
9	1	Case	F	7.92	Ger	1915	Topsoil
10	1	Case	F	7.92	Ger	1916	Topsoil
11	1	Case	F	7.92	Ger	1916	Topsoil
12	1	Round	UF	.303	Br	?	Topsoil
13	3	Case	UF	7.92	Ger	?	Topsoil
14	1	Case	F	7.92	Ger	1915	Topsoil
15	1	Case	UF	.303	Br	?	Topsoil
16	1	Case	F	7.92	Ger	1916	Topsoil
17	1	Case	F	7.92	Ger	1916	Topsoil
18	1	Case	UF	.303	Br	?	Topsoil
19	1	Case	UF	.303	Br	1915	Topsoil
20	1	Case	F	7.92	Ger	?	Topsoil
21	1	Case	UF	.303	Br	?	Topsoil
22	1	Round	UF	7.92	Ger	1916	Topsoil
23	12	Case	UF	7.92	Ger	?	Topsoil
24	1	Round	UF	7.92	Ger	?	Topsoil
25	1	Case	F	7.92	Ger	1915	Topsoil
26	1	Case	?	7.92	Ger	?	Topsoil
27	2	Round	?	?	?	?	Topsoil
28	1	Case	F	?	?	?	Topsoil
29	1	Round	UF	Webley	Br	?	Layer001
30	1	Case	F	7.92	Ger	1917	Layer001
31	1	Case	F	7.92	Ger	?	Layer001
32	1	Case	F	7.92	Ger	1915	Layer001
33	1	Case	F	7.92	Ger	1916	Layer001
34	1	Case	F	7.92	Ger	?	Layer001
35	1	Case	F	7.92	Ger	1916	Layer001
36	1	Case	F	7.92	Ger	1917	Layer001
37	1	Case	F	7.92	Ger	1917	Layer001
38	1	Case	F	7.92	Ger	1917	Layer001
39	1	Case	F	7.92	Ger	?	Layer001
40	1	Case	F	7.92	Ger	1916	Layer001
41	1	Case	F	7.92	Ger	1916	Layer001
42	1	Case	F	7.92	Ger	1915	Layer001
43	1	Case	F	7.92	Ger	1916	Layer001

44	7	Round	UF	7.92	Ger	?	Layer001
45	1	Round	UF	7.92	Ger	?	Layer001
46	1	Case	F	.303	Br	1917	Layer001
47	1	Case	F	7.92	Ger	?	Layer001
48	1	Case	F	7.92	Ger	1916	Layer001
49	1	Case	F	7.92	Ger	1917	Layer001
50	1	Round	UF	.303	Br	1916	Layer001
51	1	Round	UF	7.92	Ger	?	Layer001
52	1	Round	UF	.303	Br	1917	Layer001
53	1	Case	UF	7.92	Ger	1916	Layer001
54	1	Case	UF	7.92	Ger	?	Layer001
55	1	Case	UF	7.92	Ger	1915	Layer001
56	1	Case	UF	7.92	Ger	1917	Layer001
57	1	Case	UF	7.92	Ger	1915	Layer001
58	1	Case	UF	7.92	Ger	1915	Layer001
59	1	Case	UF	7.92	Ger	1916	Layer001
60	1	Case	UF	7.92	Ger	1915	Layer001
61	1	Case	UF	7.92	Ger	1915	Layer001
62	1	Case	UF	7.92	Ger	1916	Layer001
63	1	Case	F	7.92	Ger	1916	Layer002
64	1	Case	F	7.92	Ger	1915	Layer002
65	1	Case	F	7.92	Ger	1916	Layer002
66	1	Round	UF	7.92	Ger	?	Layer002
67	1	Case	F	7.92	Ger	?	Layer002

Grenades, Shrapnel and Mortars

SF Number	Quantity	Component	Nationality	Type	Comments	Tr	Context
1001	1	Ceramic Bead	Ger	Stick Grenade Pull		1	Topsoil
1002	1	Ceramic Bead	Ger	Stick Grenade Pull		1	Topsoil
1003	17	Shrapnel Balls	Br	Shrapnel Balls		1	Topsoil
1004	1	Blast Cap	?			1	Topsoil
1005	1	Bottom of Stick Grenade	Ger	Stick Grenade	Star Shaped	1	Topsoil
1006	1	Bottom of Flare Case	Br	Flare	Wadding Within	1	Topsoil
1007	1	Shrapnel Ball	?Ger	Shrapnel Ball	17mm Diam	1	Topsoil
1008	3	Shrapnel Balls	Br	Shrapnel Balls		1	Layer 001
1009	16	Shrapnel Balls	Br	Shrapnel Balls		1	Layer 006

1010	8	Shrapnel Balls	Br	Shrapnel Balls		1	Layer 002

*Other Finds (**Bold** = possible tank associations)*

SF Number	Category	Description	Trench	Context	Comments
2001	Tin	round tin or container diam c45mm height 15mm.	1	Topsoil	Contains wax/Vaseline
2002	Pottery	Pottery sherd	1	Topsoil	Blue loop type pattern on mottled grey - glazed finish. 55x35mm Ger.
2003	Glass	Broken sherd of curved glass 45x25mm	1	Topsoil	
2004	CuA	Tarpaulin ringlets	1	Topsoil	German. 19mm diam. Although in topsoil, perhaps related to burials in this trench?
2005	Pottery	Pottery Sherd	1	Topsoil	Dark tan/speckled - salt glazed stoneware. 50x30mm
2006	?Bone	Bone frag associated with SF1004	1	Topsoil	
2007	Bone	Bone Fragment	1	Topsoil	
2008	Pottery	Pottery sherd	1	Topsoil	White with black circle containing yellow dot. 30mm x 15mm
2009	Lead	Lead Fragment	1	Topsoil	Smooth dome with curved rim. 60x20x15mm
2010	Metal	Buckle	1	Layer 001	Rectangular buckle with squared edges. 1mm

					thick, 25mm wide, 58mm long
2011	Metal	Buckle	1	Layer 001	Rectangular buckle with rounded edges and pin attached to central bar. Buckle 2mm thick, 32mm wide, 60mm long. Pin 20mm long
2012	Metal	Buckle	1	Layer 001	Rectangular buckle with rounded edges and pin attached to central bar. Buckle 2mm thick, 32mm wide, 60mm long. Pin 20mm long
2013	**Fe Obj**	**Tank Drive Chain**	**1**	**Layer 001**	**Figure of 8 shaped RE object - link of Tank drive chain. 65mm wide and 150mm long**
2014	Fe Obj	Fuse for 18lb shrapnel	1	Layer 001	Circular metal component of a shrapnel shell. External diam 67 mm internal 44mm. Height 22mm
2015	Tin	Tin lid and base	1	Layer 001	Possible polish tin: 73mm diameter
2016	Tin	Possible canteen neck	1	Layer 001	Bottle neck made of tin? 21mm diameter
2017	Tin	Can	1	Layer 001	Tin? Can fragmentary. Squared edges and flat sides

2018	Glass	Gas Mask eyepiece	1	Layer 001	Fragment of a gasmask eyepiece. 55mm diameter
2019	Bone	Bone fragments	1	Layer 001	
2020	Pottery	Pottery sherd	1	Layer 001	Rim sherd. Black rim and dark brown back
2021	Pottery	Pottery sherd	1	Layer 001	Pot sherd; light green with dark green stripes and beige interior. Dark green rim
2022	**CuA**	**Fuel canister cap**	**1**	**Layer 001**	**Fuel canister lid cap, degraded CuA and with internalised rubber fitting.**
2023	CuA	Webbing clip	1	Layer 001	Brass webbing clip
2024	Fe Obj	Charger	1	Layer 001	Fe charger
2025	Fe Obj	barbed wire	1	Layer 006	small stand of Ger barbed wire
2026	Fe Obj	barbed wire	1	Layer 006	small strand of British barbed wire
2027	Pottery	Tile frag	1	Layer 006	Possible ?Roman tile frag
2028	Pottery	Pottery sherd	1	Layer 006	White pottery sherd with blue patterning
2029	Glass	glass sherd	1	Layer 006	Glass fragment
2030	Bone	Tooth	1	Layer 006	Animal tooth
2031	Pottery	Pottery sherd	1	Layer 006	Green pot sherd
2032	CuA	Driving band	1	Layer 006	Fragment of CuA artillery shell driving band
2033	Bone	Bone fragment	1	Layer 006	Bone Fragment

2034	Fe Obj	Shell fragment	1	Layer 006	Piece of shell splinter
2035	Wood	wooden pieces	1	Layer 006	wooden fragments
2036	CuA	CuA Obj	1	Layer 006	CuA fragments
2037	Bone	animal bone	1	Layer 002	Proximal of animal femur
2038	**Tin**	**Petrol can**	**1**	**Layer 002**	**part of a petrol can – directly on top of track**
2039	Bone	animal bone	1	Layer 002	fragment of animal metacarpal
2040	Glass	Gas Mask eyepiece	1	Layer 002	part of a respirator eyepiece
2041	Bone	animal bone	1	Layer 002	animal bone frag
2042	Pottery	Pottery sherd	1	Layer 002	white porcelain sherd
2043	Fe Obj	barbed wire	1	Layer 002	strand of barbed wire
2044	Pottery	Pottery sherd	1	Layer 002	black glazed pottery sherd
2045	Glass	glass sherd	1	Layer 002	Glass fragment
2046	Glass	Gas Mask eyepiece	1	Layer 002	part of a respirator eyepiece
2047	Bone	animal bone	1	Layer 002	Bone Fragment
2048	Pottery	Pottery sherd	1	Layer 002	black pottery sherd
2879	**Fe Obj**	**Fe object**	**1**	**Layer 001**	**Heavy circular object, 113mm in diameter. 15mm thick. Possible armour - found by track**
3001	CuA	Driving band	1	Layer 001	Fragment of CuA artillery shell driving band
3002	Fe Obj	Shell Fragment	1	Layer 001	Fe shell case with CuA driving band
3003	Fe Obj	Shell	1	Layer 001	Fe shell frag

		Fragment			
3004	Fe Obj	Shell Fragment	1	Layer 001	Fe shell frag
3005	**Fe Obj**	**Shell fragment**	**1**	**Layer 001**	**Fe 6lb shell fragment**
3006	Fe Obj	fuse cap	1	Layer 001	fuse cap
3007	Fe Obj	Shell fragment	1	Layer 001	Fe shell frag
3008	CuA	Shell fragment	1	Layer 001	shell fuse head and ring
3009	**Fe Obj**	**Tank Track**	**1**	**Layer 002**	**Large section of ww1 tank track with some green paint still adhering. This segment was lying face down and with one 'spud' still attached. 10 complete pads, one half pads.**
9001	Fe Obj	screw picket	2	Layer 009	778mm long screw picket – allied
9002	Fe Obj	barbed wire	2	Layer 009	18 pieces of barbed wire totalling 662mm in length

SF2013	

SF2022	
SF2879	
SF3005	

Selected finds – possibly tank related

Appendix 2: Drawing List

Drawing Number	Description
1	SW Facing Section of [005]
2	Post-Ex plan of Tr.1 E
3	Post Ex plan of Tr.1 W
4	Post Ex Plan of Tr.1 S
5	Detailed (1:10) plan of Tr1 skeletons

Appendix 3: Contexts

Context Number	Trench	Cut/Fill Type	Description
(001)	1	Topsoil/Ploughsoil	Mid greyish brown silty clay, gritty and firm in texture, and with occasional stone inclusions. Having had the turf removed, the upper element of this layer was removed by hand before later machining. Many shell fragments and other war materiel in this layer. Lay above Layer 002
(002)	1	Silty Clay soil	Mid Greyish brown silty clay, gritty and firm in texture, and with occasional stone inclusions. This layer lay below Layer 001 and was perhaps the uppermost layer of a shell crater (Cut 003). This layer also surrounded the tank track and was excavated entirely by hand.
[003]	1	Possible Crater	Possible crater. An area of c2mx1m was excavated though the feature was not excavated to its base. The excavated component was filled

			with Layer 002 and had war materiel including the tank track and the remains of at least two German soldiers within it. The feature was curved in its outer edge.
(004)	1	Grainy Soil	Mid Greyish brown grainy soil with flecks of charcoal and small amount of chalk. This layer was the fill of shell crater (Cut 005) and was excavated entirely by hand. Some Fe fragments within the layer. This layer was some 121.5 x 102.5cm in size.
[005]	1	Probable shell crater	A small shell crater on the Western Front by the Hindenburg Line. This crater, filled by Layer 004, was some 121.5x102.5 in size and oval in form. The crater had a concaved and uneven base.
[006]	1	Probable Shell crater/Troop shelter	A probable shell crater or troop shelter. At least 210x124cm in size although not fully excavated. This had steep sides and was filled by Layer 007 which included corrugated iron sheets.
(007)	1	Silty Clay Soil	Light to mid-brown to yellowish-brown silty clay soil with some reddish-brown components. The soil was friable in texture and over 47cm in depth. This layer was excavated by hand and formed the uppermost fill of shell crater [006]. The layer included war materiel including two large sheets of (German)

			corrugated iron also known as 'elephant iron'.
(008)	1	Natural Subsoil	Natural undisturbed mid reddish-brown clay subsoil. Unexcavated.
(009)	2	Clay soil	A clean light brown/orange clay soil with no inclusions. This layer was in Trench 2 and represents the fill of a shell crater. Included iron fragmentation and a screw picket.
[010]	2	Probable shell crater	A sub circular feature within Trench 2 which was visible after weathering. Cut into natural and filled with (009). Presumed to be a shell crater.

Appendix 4: Human Remains (see Fig 1 and 2)

The remains of two soldiers, Trench 1 (Harvey Mills)

Skeleton 1 (S1)

This body lay directly above skeleton 2 and was discovered during the final cleaning of the site after the removal of the tank track (Sf 3009). The body was extended, prone and with left arm outstretched and bent, and right arm by his side. The body was directly below the tank track, roughly North-South aligned and with the skull facing north.

No pathology was immediately visible and no formal assessments on age or stature were made prior to the remains being handed over to the authorities.

Find Region	Item	Comment
Spine/right scapula	Large piece of iron fragmentation	Possible shell splinter – no indication that this was cause of death
Lower Back	X2 brass side-hook belt supports from tunic X2 brass button-like rear belt hooks from tunic (with 6-hole fixing plate and Imperial Prussian crown motif) Pistol rounds and leather pouches	 Perhaps indicative of being part of a machine gun team (this individual had no artefactual elements consistent with having been and officer)
Back Area	Shirt buttons	
Pelvic Area	X1 respirator tin	In place on the back of the soldier, the tin was not opened.
Feet Area	X2 heels with parts of leather uppers from German M1884 'jack-boots'	Boots in poor condition but with foot bones within
Left Arm	X1 spoon Possible periscope mirror rectangular piece of glass, no silvering surviving Zeltbahn eyelet	No visible service number or etching Rectangular piece of glass, Some silvering surviving

General Comment

The body lay directly above skeleton 2 and would have been interred in the same incident. The eyelets of a zeltbahn (groundsheet) lay around both skeletons and suggested that the bodies, although not deposited with much formality, may well have been covered – their articulation levels would also suggest that they were not left exposed for any length of time. The tank track was directly over this body but the preservation of the bones indicated that the soldier had not been driven over or crushed by the tank. No identification elements were found with this body and most of the useful equipment had been recovered. Belt support hooks were found along with ?Prussian crown button. No helmet or belt buckle was present. This individual was still wearing boots the hobnails of which were well preserved but the leather much decayed. It seems as though both of the bodies had been tipped into a shell crater and then covered rapidly. The tank track may have been part of a deliberate covering process but this was not certain. The skeleton had a mirror by him and also a spoon but nothing that would narrow down the potential military unit he belonged to. There was a gasmask on his lower back, and also a large piece of iron fragmentation across his right scapula. There was nothing to suggest that this had killed him.

There was nothing to suggest he was an officer and, although there are several potential explanations for this soldier having a number of pistol rounds in pouches, one possibility is that he was part of a machine gun team. This might correspond to annotations on contemporary Australian maps that tank 796 was utilised as a machine gun post after its initial destruction.

The remains were fully recovered and collected by the relevant authorities. No immediate identification of the soldier was possible.

Skeleton 2 (S2)

This body lay directly below skeleton 1 and was discovered during the final cleaning of the site after the removal of the tank track (Sf 3009). The body lay on his left side and was flexed with arms by his side. The body was roughly North-South aligned with the skull at the northern end.

Find Region	Item	Comment
Back area	Shirt buttons	
Shoulder area	X1 respirator tin Unidentified Leather object	Tin was not opened
Neck Area	Single epaulette button	With a number '2'
Skull Area	Zeltbahn eyelets Brass Buckle	
Right Arm	Piece of feldgrau uniform	CuA object adhering
Waist Area	Leather ammunition pouches	With 7.92 rounds

	Spare Respirator filter Stick grenades Trouser buttons	
Pelvis Area	Zeltbahn eyelet	
Feet Area	X2 heels with parts of leather uppers from German M1884 'jack-boots'	Boots in poor condition but with foot bones within. The leather was fragmentary on the bones but also stained the Tibia and fibula even when it was no longer present.

General Comment

The body lay directly below skeleton 1 and would have been interred in the same incident. The eyelets of a zeltbahn (groundsheet) lay around both skeletons and suggested that the bodies, although not deposited with much formality, may well have been covered – their articulation levels would also suggest that they were not left exposed for any length of time. The tank track was partially above this body too but, like skeleton 1, had not been driven over or crushed by the tank. No identification elements were found with this body and most of the useful equipment had been recovered. Belt support hooks were found and a number '2' epaulette button indicating that this soldier was from the second company of a particular unit. No helmet or belt buckle was present. This individual was still wearing boots the hobnails of which were well preserved but the leather much decayed. It seems as though both of the bodies had been tipped into a shell crater and then covered rapidly. The tank track may have been part of a deliberate covering process but this was not certain. Some CuA staining to upper and lower left jaw though this is probably indicative of the close proximity of a brass object post-burial.

The remains were fully recovered and collected by the relevant authorities. No immediate identification of the soldier was possible. The complete recovery of skeleton 2 required a small extension to the north of the excavation trench. This area had 9x Mills grenades, 2x stick grenades, 1 x detonator, and 1x gas shell within it. All were removed.

Number ‘2’ Button, by skeleton 2, Trench 1 (Harvey Mills)

German boot from one of the skeletons, Trench 1 (Harvey Mills)