BATTLEFIELD CASUALTY: THE ARCHAEOLOGY OF A CAPTURED GUN

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Abstract

Many artefacts in museums lack adequate information about the context from which they were collected. Not surprisingly, this often applies to artefacts recovered from battlefields, where chaotic conditions can result in uncertainty about their origins. This paper examines the case of a Second World War German 88 mm gun preserved in an Australian museum. The museum had little contextual information for this weapon, except that the Australian Army captured it in North Africa in 1942, probably after the Second Battle of El Alamein. However, an archaeological analysis of the gun, particularly of damage incurred during battle, can link it to photographs taken after the battle and re-establish its historical context and the circumstances of its acquisition. In this way, a museum artefact can become more than a mere exhibit: it can be made to document its own past.

Introduction

The characteristics of an artefact are of primary significance in its identification, but context is also a major factor. Archaeological contexts can be static, or portable, or mobile. Many artefacts in the second and third categories are held in museum collections, where informal acquisition, poor cataloguing, or inadequate archiving have often led to a loss of contextual detail, making identification more difficult. Mobile artefacts are particularly difficult to investigate because they have multiple contexts, of which only those at the time of their collection might be ascertainable. Even that might present difficulties, however, particularly in the case of artefacts recovered from a battlefield. Nevertheless, physical and documentary evidence can be combined to reconstruct collection context and therefore identity. This paper examines the case of a Second World War German artillery piece where this has been possible. Its investigation was undertaken following a study of a similar gun in the Australian War Memorial [museum] (AWM) that provided useful comparative evidence (Pearson 2000).

Battlefield Salvage

Historically, the aftermath of a battle has usually involved the recovery of discarded artefacts for reuse, recycling, or as trophies. Even the young country of Australia has participated in such practices. The First World War, for instance, resulted in the capture of about 800 guns, 3,800 machine guns and 520 trench mortars that were distributed for display to many Australian cities

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and towns (CAPD 1917–1919: 14008). During the Second World War, guns and other weaponry were initially recovered more for technical investigation, although also for use in propaganda and eventual museum display (AWM 315 748/026/001). In addition, they were sometimes reused by the opposing combatant, such as when the Germans used British tanks and guns (AWM 52 1/5/20 November 1942) and when the Australians used German and Italian weapons, in both cases at El Alamein (AWM 52 1/5/20 October 1942; AWM 52 8/3/24 November–December 1942; AWM 315 748/026/001). Most famously, the Australians used captured Italian guns defending Tobruk in 1941 (Horner 1995: 268–269; Maughan 1966: 112–113, 239–240, 294). In addition, battlefield waste was recycled, often on an industrial scale, for reuse in the war effort (Gould 1983). The second battle of El Alamein, of particular relevance to this paper, provides a remarkably systematic example of the latter process, the 9th Australian Division being responsible for part of the cleanup of the battlefield (AWM 52 1/5/20 October–November 1942, appendices; AWM 52 1/5/22 November–December 1942). For instance, between 23 October and 30 November, the 26th Brigade, a part of the 9th Division, collected 127 three-ton truck loads of general scrap as well as many enemy and allied tanks, vehicles, guns, and mortars, all of which were amassed in a series of salvage dumps (AWM 52 8/2/26 January 1943, part 2 of 2). It was in these circumstances that the gun discussed in this paper was recovered, resulting in uncertainty about its battlefield context.

The German 88 mm Gun

The North African campaign of the Second World War was marked by dramatic reversals of fortune, and characterized by new forms of military technology and tactics. British tanks and armoured tactics were successful against the Italians, only to be routed in turn by the firepower and tactics of the German forces. Notably, the Germans made devastating use of the multi-purpose 88 mm (3.46 in) Flak 18 and 36 guns to out-range and out-shoot British armour, giving these guns a deadly reputation (AWM Private Record 3DRL/0368: 196; Bright 1951: 65; Young 1973: 96–97). It was only during the battles at El Alamein in 1942 (first battle 1 to 27 July, second battle 23 October to 5 November) that the forward momentum of the *Afrika Korps* was irretrievably reversed. Amongst other misfortunes at the second battle, the Germans lost between 50 and 84 of the Flak guns to the Allies (AWM 52 1/5/20 November 1942; Koch 1965: 166).

At least two, probably three, of these captured guns were transported to Australia in 1943 (AWM 90/1887). One of them is now in the Royal Australian Armoured Corps Museum at Puckapunyal, Victoria (fig. 1). Surprisingly,

Fig. 1. German 88 mm Flak 36 gun at the Royal Australian Armoured Corps Museum, Puckapunyal, Victoria. (Photograph by Andrew Long, April 2008.)

although this gun is from such a recent period and supposedly well documented, its history is uncertain. Over time, it has lost its 'chain of custody' (Hunter *et al.* 1996: 16, 48), and little is known about it other than that it was probably one of four guns captured by the 26th Brigade of the 9th Australian Division in North Africa in 1942. Its transport to Australia was apparently arranged by the General Officer Commanding the 9th Australian Division, later Lieutenant-General Sir Leslie Morshead (Puckapunyal 88 mm Gun File; RAAC 1974: 35). However, archaeological examination of the gun can re-establish the circumstances surrounding its use, capture and subsequent post-discard treatment, by enabling its identification in the documentary record.

According to the original German nomenclature, the Puckapunyal gun can be classified as an 8.8 cm Flak 36 L/56 gun. According to manufacturers' records: '8.8 cm' refers to the inside diameter of the barrel; 'Flak' is an abbreviation of *Fl(ieger)a(bwehr)k(anone)*, meaning aviator-defence-gun, or anti-aircraft gun; '36' refers to the model; and 'L/56' is the length of the barrel in calibres. Allied references to this type of gun describe it as an '88 mm' or '88'.

However, the gun is a complex assemblage of hundreds of components, some of which have been damaged or lost during the gun's military and subsequent use. All these components are included in the broad classification '8.8 cm Flak 36 L/56', but although guns of this type look alike, on closer examination numerous variations can be identified. This makes it possible to distinguish between guns of the same type not only by the differences amongst individual replacement parts, but also by modifications made over time including paint, identifying symbols, graffiti, and damage during action, movement and storage, as well as changes resulting from museum curation.

Variability as a Means of Identification

The 88 mm gun, in its various models, was the main German heavy anti-aircraft weapon throughout the Second World War (War Office 1948: 40). The gun was also extremely effective as a direct-fire weapon against tanks, soft-skinned vehicles, emplacements and ships, and as a field artillery piece against troops (AWM Private Record 3DRL/0368: 196; Piekalkiewicz 1992: 7; War Department 1943a: 16). Sources conflict but, depending on the ammunition used, it appears that it could fire a 9 kg projectile of 88 mm-diameter at 820–840 m/s for a maximum distance of 14,820 m horizontally and 9,100 m vertically (Ministerio del Ejército 1947: 130). Its crew of ten could fire 12–15 rounds per minute (War Department 1943a: 38, 42–43). Employed in the anti-tank role, under optimum conditions, the armour-piercing projectile could penetrate 100 mm (3.92 in) of homogeneous vertical armour at 1,829 m (2,000 yards: War Department 1943b: 29). The largest number of these guns in service at any one time during the war was 10,704 in August 1944 (Gander & Chamberlain 1978: 152).

German manufacturers created three main variants of the weapon. These were the 88 mm Flak 18, Flak 36 and Flak 37 (FMAR-25; Hogg 1997: 162–170; Müller 1990: 5–11). Production of the Flak 18 began in Germany in 1933. Combat experience in the Spanish Civil War and mass production resulted in a number of subsequent modifications. The revised model, known as the Flak 36, was designed in 1936 and put into production in 1937. It differed considerably from the Flak 18 in the construction of the platform and barrel and the use of stronger limbers for transportation. A similar weapon was introduced into service in 1939 as the Flak 37. It was basically a modified Flak 36 with a new barrel construction and a revised data-transmission system, which was quicker to use and specifically produced for co-ordinated anti-aircraft battery fire (Chamberlain & Gander 1976: 14).

According to Jentz (2001: 9, 12) and Piekalkiewicz (1992: 181), citing original German documentation, variations in the cruciform platform were the principal

Fig. 2. German historical photograph of an 88 mm Flak 18 gun in travelling position with its crew. (David Pearson's collection, date and source unknown.)

differences between 88 mm Flak 18, 36 and 37 guns. The platform consisted of a top and a bottom carriage, the former rotating 360° independently on the bottom carriage, to which could be fitted limbers with pneumatic tyres for transportation (fig. 2). The barrel sat in a recoil cradle attached to a saddle by two trunnions permitting elevation from -3° to +85° and was provided with a recuperator to bring it back into position after firing. Flak 18, 36 and 37 barrels were identical in principal dimensions and ballistic performance, differing only in construction and appearance. It appears that all three barrel-variants were designed to be interchangeable with all three variants of cruciform platform (fig. 3). The gun could be modified further by adding or removing other components, without any significant change in ballistic performance. Through careful examination, therefore, it is possible to distinguish a particular gun from others of its type. The Puckapunyal gun, although designated a Flak 36, was fitted with an earlier Flak 18 barrel, and a number of smaller components have been either added or removed over time.

Identifying the Puckapunyal Gun

An artefact is a document of its own history. Two identical 88 mm Flak 36 guns straight from the factory might have had identical components and similar markings except for their serial numbers. These same objects in the same operational context might also have had identical paint application, but in battle these guns might have had different markings indicating unit and gun number, as well as different victory or kill symbols. In addition, components might have differed as repairs and replacements became necessary, or to meet the requirements of particular engagements. Furthermore, if the same guns were damaged in action or in any other way, they are unlikely to have received identical damage, thus giving them individuality. Following their capture, they might also have received different treatment, including component removal, graffiti, and repainting for museum exhibition.

Unlike many guns of its type that were in North Africa, the Puckapunyal gun is fitted with an armoured recuperator shield (*Zwischenschild*), in this case of Type 1 (Trojca 2005: 15). There is no longer a front armoured shield but there is a shield-mounting bracket bolted to the right front of the saddle, showing that a shield was formerly present. The gun is also missing many other components. The breechblock, barrel slide lock, sight-bracket, the top of the fuse-setter, azimuth and elevation indicator globes and covers, one transport limber, one outrigger jack-pad, pedestal access cover, sights, and numerous small detachable components are all missing and were probably removed after the gun was captured by the Australian Army, some of them perhaps as souvenirs.

Manufacturers' Markings

Treatment since its capture, including museum restoration, has destroyed other markings on the Puckapunyal gun but stamped ones have survived. Examples on the top of the rear spar identify the gun as an 8.8 cm Flak 36, with gun number 1735, manufactured in 1941. Markings on the Flak 18 barrel sleeve and breech ring provide an early serial number R.531 ('R' for *Rohr*: [gun barrel]) and 1936 as the manufacturing date. In addition, lower case letter codes indicate at least six different manufacturers, of which five can be identified, 'bwn' for example indicating Friedrich Krupp of Essen, Germany's best-known armaments producer (Walter 1996: 22). These security codes were progressively introduced from February to May 1941 (Seeger 1996: 137; Walter 1996: 9–10). Thus the gun was assembled from components produced in a number of places, probably for both logistical and security reasons. An upper case marking ('BVG')

found on the 1936-dated breech ring might have been an earlier type of manufacturer's mark.

Paint, Symbols and Graffiti

Although concealment necessitated camouflage painting, symbols were displayed on many weapons in the form of painted regimental badges, numbers, victory or kill emblems, and other markings. Many historical black-and-white photographs of 88 mm Flak guns in North Africa show that, although camouflage-painted, most also had symbols and numbers on them. Unfortunately all such markings, as well as graffiti probably applied to the gun after its capture, have been obliterated from the Puckapunyal gun since its arrival in Australia. Storing such large artefacts outdoors, and subsequently stripping and repainting them without any prior recording, destroys this type of evidence. In the case of the Puckapunyal gun, it has been sandblasted at least once and repainted at least three times since capture and could also have had several layers of paint applied before it was captured. A fragment of paint surviving in a location difficult of access was sectioned and examined microscopically. Seven layers of paint were revealed, of which the two uppermost are known to have been applied since the gun's capture.

Some evidence of former markings on the gun is provided by the record of a 1974 meeting of the Board of Trustees of the Australian War Memorial, which stated that: "Beneath the new paintwork can be seen the rings painted around the barrel indicating several kills" (AWM 90/1887). The presence of these victory rings on the barrel might assist in the identification of the gun in historical photographs, but it is the details of physical damage to the weapon that are most important in reconstructing its context at the time of capture.

Physical Damage

A number of processes can act on an artefact and leave recognisable patterns of damage (Schiffer 1996: 271). These were clearly evident on the Puckapunyal gun, indicating that it had suffered counter-offensive action. There might also have been damage from transportation or from display after its capture. All such evidence can be organised into a damage profile for the gun, most of the damage being apparently caused by a high velocity projectile or shrapnel (Table 1; fig. 3).

From this evidence the following conclusions can be reached. First, the damage at points 1–5 (Table 1) originated from the left side of the gun. Second, the projectile that caused the perforation at point 5 subsequently passed through point 7 and exited on the right side at point 9. For this to occur, the barrel

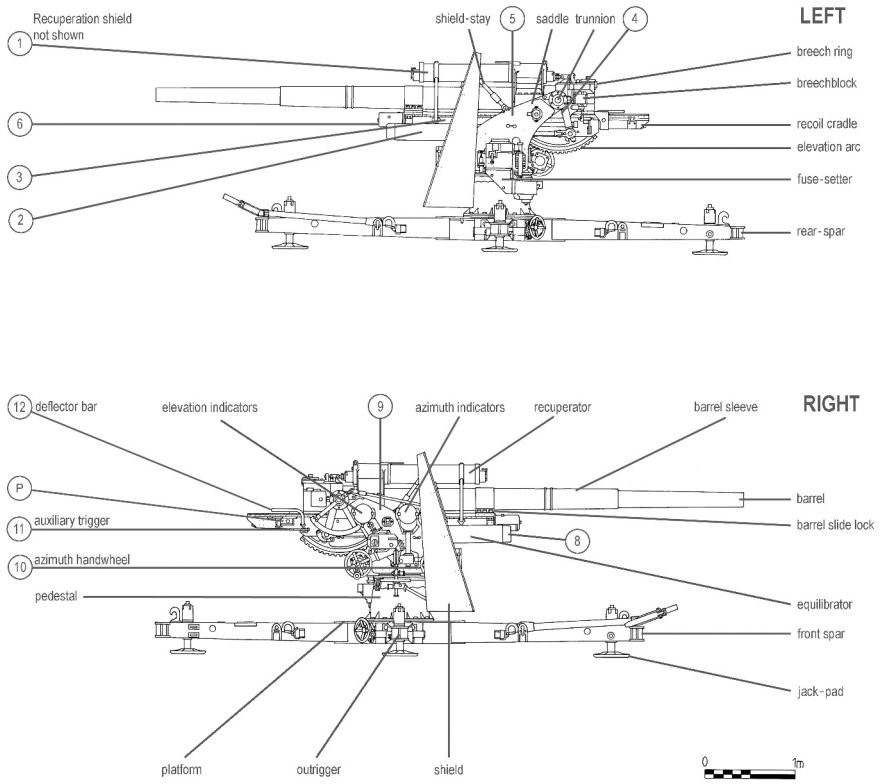

Fig. 3. Major components of typical 88 mm Flak 36 gun. Numbers refer to damage points, as in Table 1, but damage point 7 is not visible in these views. 'P' indicates location of paint sample examined microscopically. (Drawing by David Pearson and Andrew Long.)

must have been in a horizontal position at the time of impact. The angle of the projectile's path suggests that the target was higher than the gun from which it was fired. This damage to the recoil mechanism would have put the gun out of action. Assuming that the diameter of the perforations at points 5, 7 and 9 indicates the size of the projectile, it appears that a high velocity armour-piercing projectile of around 40 mm hit the Puckapunyal gun. This is consistent with the use by the Allies of 2-pounder (40 mm) projectiles in their anti-tank and tank guns. Third, damage to the left front of the gun at the recuperator shield, equilibrator, and recoil cradle, at points 1–4, seems to have resulted from a separate event. Fourth, deformation of components on the right side of the

gun at points 8 and 10–12 suggest shrapnel damage from the right front, perhaps on yet another occasion. Fifth, a right front-shield bracket suggests that the gun was once fitted with a front shield, and that it, the shield-stays, and the left bracket have been lost, perhaps partly as a result of enemy fire. Clayton (1996: 19) suggests that the battle-scarring of First World War artillery trophies was a positive feature in their propaganda role. Perhaps the Puckapunyal gun was chosen as a war trophy because it had sustained battle damage.

Evidence from Historical Photographs

Many black-and-white photographs of 88 mm guns in the Western Desert during the Second World War, and in Australia during and after the war, reveal the variability of these guns, and help to identify the Puckapunyal gun. A photograph taken at Puckapunyal Army Camp in 1952, two photographs of a gun on display in Tasmania in 1945, and fourteen photographs in the Western Desert in 1942–1943 are relevant to this task. The chain of custody from its capture to the present time can be reconstructed by comparing damage and other details on the gun and in the photographs. The photographic evidence is summarized in Table 2 and the details of the historical photographs are listed in Table 3. Analysis of the evidence provided by these photographs shows that they all most probably represent the same gun captured in the Western Desert in October to November 1942. They show a gun in its discard context, after action in the desert and after receiving considerable counter-fire. The latter is indicated by the loss of part of its front shield and damage to other components. Some of the captions indicate that this gun was associated with the Australian 2/3rd Pioneer Battalion, and mention a location near a railway hut called 'the Blockhouse' by the Allies (the Germans called it 'the Hut') and the coast road west of El Alamein. In addition, two of the captions provide an absolute date of 7 November 1942 for the gun *in situ* and a relative date for its recovery. Furthermore, they suggest that sometime before 1945 this gun was modified by the Australian Army, by removing the remains of its front shield, removing other components, and repainting it, resulting in the destruction of the original paint and symbols.

Comparing the Puckapunyal Gun with the Historical Photographs

The details of the Puckapunyal gun and some of its damage are identical to those seen in the historical photographs, indicating that this is the weapon shown in those photographs, although it has been modified since capture. The following are comparable (Tables 1–3):

Table 1. Major damage on the Puckapunyal gun

Point	Location	Description	Possible cause
1	Left side of recuperator shield	Indentation	Shrapnel?
2	Left equilibrator	Indentation	Shrapnel?
3	Left side of recoil cradle, front	Indentation	Shrapnel?
4	Left side of recoil cradle, rear	Perforation	Shrapnel?
5	Left saddle	ca. 40 mm diameter perforation from a ca. 90° and slightly upwards trajectory. Rearward petalling of metal indicates entry from left side, through No. 7, towards No. 9	2-pounder (40 mm) projectile
6	Front of recoil cradle, nose-cap	ca. 20 mm perforation	Shrapnel?
7	Middle of recoil cradle	Perforation from No. 5, towards No. 9	2-pounder (40 mm) projectile
8	Right equilibrator, cylinder cap	Deformation	Post-discard?
9	Right saddle	ca. 40 mm diameter perforation from a ca. 90° and slightly upwards trajectory, from No. 5, through No. 7, exiting at No. 9	2-pounder (40 mm) projectile
10	Azimuth handwheel	Deformation	Shrapnel?
11	Auxiliary trigger?	Deformation	Shrapnel?
12	Deflector bar	Deformation	Post-discard?

Table 2. Summary of photographic evidence

Photograph Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Date (1952–1942)	52	45	45	42	42	42	42	42	42	42	42	42	42	42	42	42	42
Damage																	
Left side																	
Indentation, recuperator shield							*	*	*	*	*	*		*			
Indentation, equilibrator	*							*	*	*	*			*			
Indentation, recoil cradle front	*							*				*	*	*			
Perforation, saddle	*									*	*	*	*		*		
Abrasion, outrigger jack-pad, raised							*	*									
Two penetrations, left side shield	**N**	**N**	**N**				*	*		*		*		*			
Front																	
Recoil cradle nose-cap														*	*		
Right side																	
Deformation, azimuth handwheel			*		*											*	*
Deformation, auxiliary trigger?																*	
Deformation, deflector bar	*																
Abrasion, outrigger jack-pad, raised				*	*	*											
Most of right front shield missing	**N**	**N**	**N**	*	*	*		*	*			*	*	*	*	*	*
Components																	
Flak 18 barrel	*	*	*	*	*	*	*	*		*	*	*	*	*	*	*	*
Flak 36 carriage	*	*		*	*	*	*	*		*	*	*	*	*		*	*
Recuperator shield	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Special trailer 202 limbers	*	*			*	*	*	*	*		*	*	*	*	*	*	*
Front shield	**N**	**N**	**N**	*	*	*	*	*	*	*	*	*	*	*	*		*
Breechblock	*		*	*	*	*	*			*	*	*	*			*	*
Barrel slide lock	**N**	**N**	**N**	*	*	*	*	*		*	*	*		*	*		
Top of fuse-setter										*	*	*					
Azimuth&elevation indicator			*		*											*	
Azimuth&elevation indicator covers																*	
Sight bracket				*	*	*										*	*
Right outrigger jack-pad		*		*	*	*											
Markings																	
'B', recuperator shield (left or right)				*	*	*	*	*	*	*				*		*	
3 dark kill rings, upper barrel sleeve					*		*	*		*	*	*	*				
6 light kill rings, lower barrel sleeve				*	*	*	*	*		*	*	*	*	*	*	*	*
Ship silhouette, left front shield	**N**	**N**	**N**					*	*					*	*		
Two-tone camouflage on shield	**N**	**N**	**N**					*	*	*				*			
Historical																	
Associated with 2/3rd Pioneers						*	*	*	*	*				*	*	*	

* = Ascertainable; **N** = Component not present

Table 3. Details of historical photographs

Number	Source and précis of caption where present	Origin
1	Puckapunyal Army Camp 1952	Hunt Collection
2	Gun on display near Franklin Square, Hobart, 1945	W.L. Crowther Library, State Library of Tasmania AUTAS001125298612
3	German gun on show outside Albert Hall, Launceston, 1945	*Examiner* 28 March, 1945:5
4	German 88 mm gun	Hamilton Collection
5	German 88 mm gun left behind at El Daba. Photograph by Frank Hurley	AWM014319
6	No caption, from 2/3rd Pioneer Battalion Album	Anderson Collection
7	Captured 88 mm gun ready for removal to salvage. Another print of this photograph is captioned '88 mm Gun taken near Blockhouse. This gun was sent back to Australia'. From 2/3rd Pioneer Battalion Album	Anderson Collection Bannigan Collection
8 & 9	No caption, from 2/3rd Pioneer Battalion Album	Bannigan Collection
10	German 88 mm gun near Blockhouse. From 2/3rd Pioneer Battalion Album	Anderson Collection
11	Captured German 88 mm gun	Hamilton Collection
12	German 88 mm gun abandoned near the coast road west of El Alamein, 7 November 1942. Photograph by Sergeant Palmer	IWM E19174
13	German 88 mm gun abandoned near the coast road west of El Alamein, 7 November 1942. Photograph by Sergeant Palmer	IWM E19173
14	88 mm gun near Blockhouse. From 2/3rd Pioneer Battalion Album	Bannigan Collection
15	No caption, taken by Sergeant David Anderson, 2/3rd Pioneer Battalion, November 1942	David Pearson's collection
16	Captured 88 mm gun. From 2/3rd Pioneer Battalion Album	Bannigan Collection
17	88 mm gun cleverly sited	Hamilton Collection

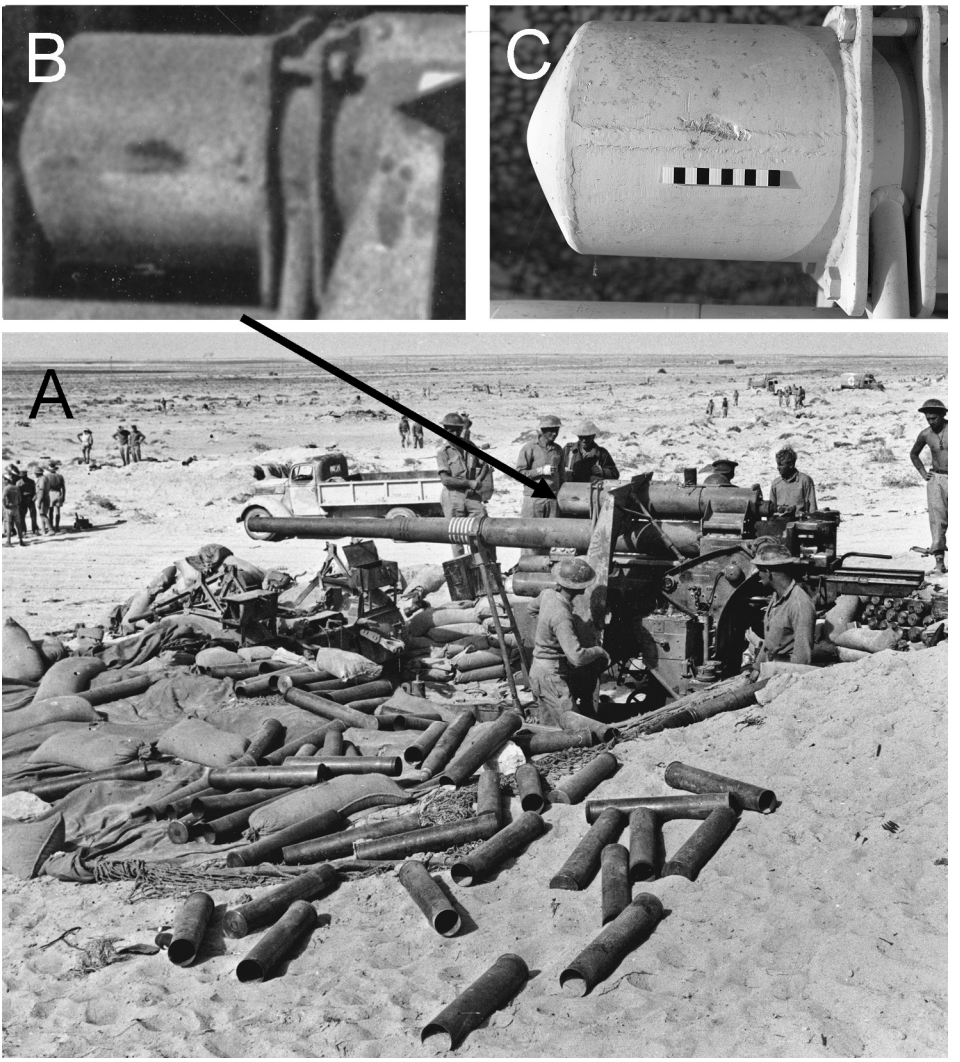

Fig. 4. **A.** Historical photograph 12. German 88 mm gun captured west of El Alamein during the second battle, being inspected by Allied troops. Photograph looking west-south-west, towards the Blockhouse in the far background. Taken by Sergeant Palmer, 7 November 1942 (IWM E19174). **B.** Close-up of damage point 1. **C.** Close-up of damage point 1 on the Puckapunyal gun, scale in centimetres. (Photograph by Andrew Long, April 2008.)

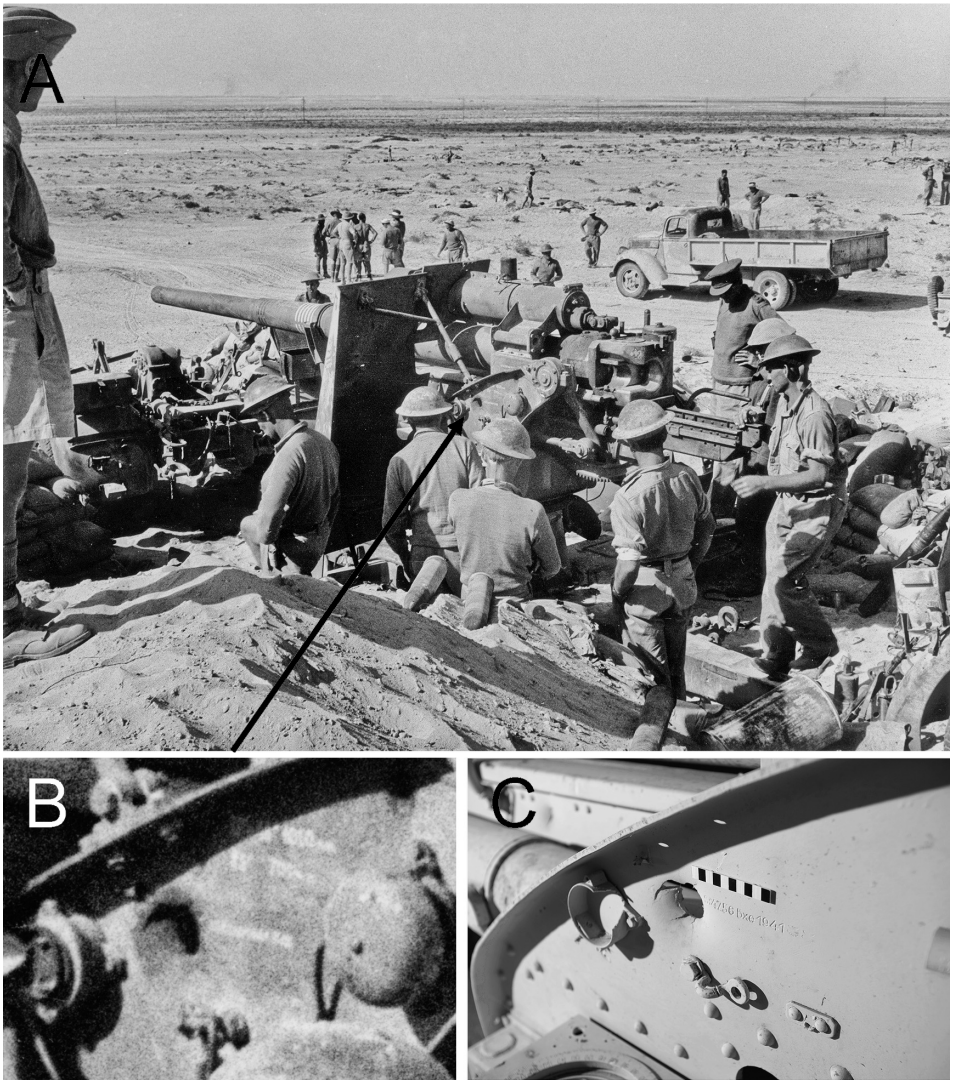

Fig. 5. **A.** Historical photograph 13, one of the most informative. German 88 mm gun, as Figure 4. Photograph looking south-west, taken by Sergeant Palmer, 7 November 1942 (IWM E19173). **B.** Close-up of projectile damage point 5. **C.** Close-up of damage point 5 on the Puckapunyal gun, scale in centimetres. (Photograph by Andrew Long, April 2008.)

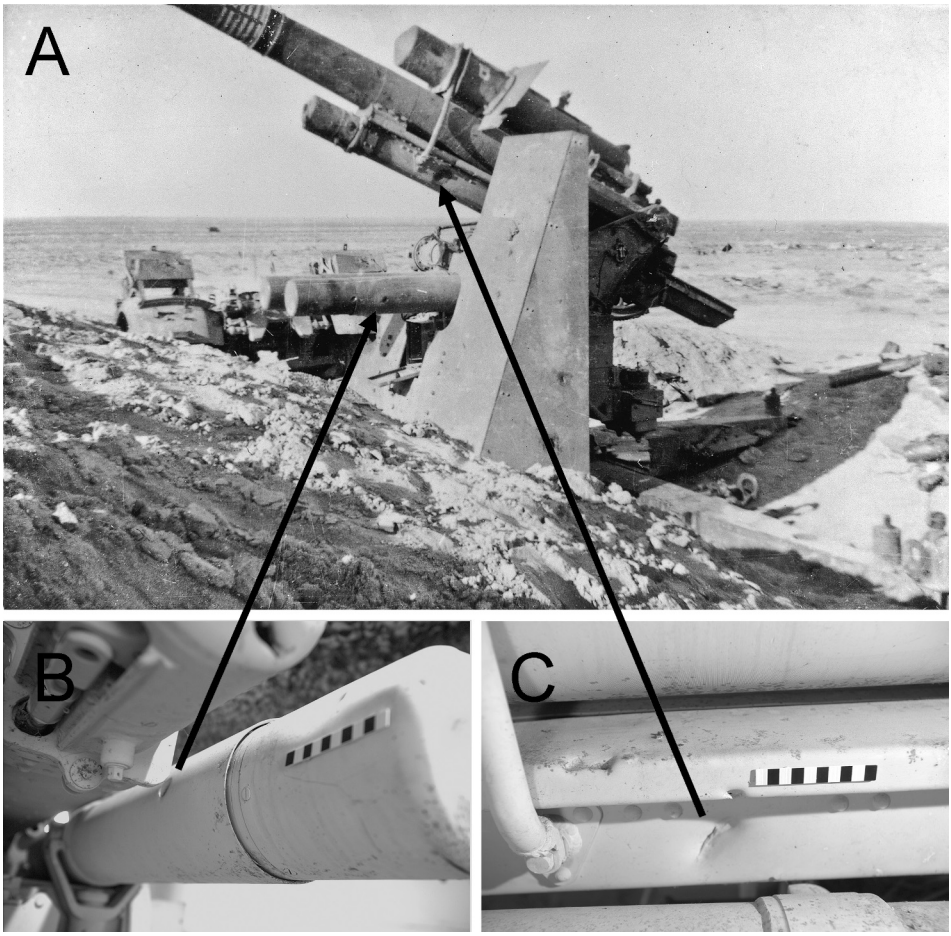

Fig. 6. **A.** Historical photograph 14. German 88 mm gun, as Figure 4. Photograph looking south, showing damage points 2 and 3 (Bannigan Collection). **B.** Close-up of damage point 2 on the Puckapunyal gun (now on the inner side because of incorrect restoration reassembly after 1952). **C.** Close-up of damage point 3 on the Puckapunyal gun. Scale in centimetres on **B** and **C**. (Photographs by Andrew Long, April 2008.)

1. The gun has an 88 mm Flak 18 barrel and Flak 36 carriage. It also has the optional recuperator shield. This is consistent with all of the photographs where ascertainable.
2. The gun was once fitted with a front shield. This is indicated by the shield-mounting bracket on the right front of the saddle. Mounting holes in the left front of the saddle suggest the removal of the left shield-mounting bracket. Photographs nos. 2 and 3 show that the shield had already gone by 1945. Several of the photographs taken in the Western Desert show a gun whose right shield is partly missing as a result of counter-offensive action, and the damaged remains must have been removed later.
3. On the gun there is deformation of a component tentatively identified as the auxiliary trigger (War Department 1943c: 15), that can also be seen in photograph no. 16 (damage point 11).
4. The recuperator shield on the gun has an indentation on its left side (damage point 1). Similar damage is shown in photographs nos. 7–12 and 14 (fig. 4).
5. The gun has a perforation to the left side of the saddle (damage point 5) that is consistent with similar damage shown in photographs nos. 1, 10–13 and 15 (fig. 5).
6. The gun has an indentation on the left equilibrator (damage point 2), consistent with similar damage shown in photographs nos. 1, 8–11 and 14 (fig. 6).
7. The gun has an indentation on the front left side of the recoil cradle (damage point 3) that is consistent with similar damage shown on photographs nos. 1, 8, and 12–14 (fig. 6).
8. The gun has a perforation in the front of the recoil cradle nose-cap (damage point 6) that can be seen in photographs nos. 14 and 15.
9. The gun has a missing barrel slide lock, as is the case with the gun shown in photographs nos. 1–3, taken in Australia. This lock appears to have been lost after capture but before 1945 and probably indicates that the barrel had been removed for evaluation and reassembled without this critical component.

Retrieving Lost Characteristics of the Puckapunyal Gun

Given that the Puckapunyal gun is the same as that shown in the photographs taken in the Western Desert, then those photographs can provide additional information that is no longer ascertainable from the weapon itself:

1. Three dark (probably red) victory or kill rings on the middle of the barrel and six light (probably white) similar rings to the rear of the dark rings.
2. Letter 'B' on both sides of the recuperator shield, indicating that it is the second gun of a battery.
3. Ship silhouette on the surviving left front shield, indicating the sinking of a ship.
4. Gun painted in one colour except for shield that is painted in two-tone camouflage.
5. Presence of standard front shield (*Schutzschild* Type 1 according to Trojca 2005: 10). Half of the right side panel of the shield has been shattered and there are two damage points on the left side panel.
6. Many components subsequently removed are shown, such as the breechblock which was present in 1952.

Reconstructing the Discard Context of the Puckapunyal Gun

Because the Puckapunyal gun is the 88 mm gun shown in the photographs taken in Egypt, apparently at El Alamein, it is possible to suggest its discard site. Photographs nos. 9–14 show an elevated position in which the gun is emplaced. Photograph no. 9 also shows the Alamein coast road and photographs nos. 10–13 show the railway line and telegraph poles in front of the gun's position. In photographs nos. 11 and 12, a large rectangular structure in the distance was the one called 'the Blockhouse'. This is mentioned in the photograph captions and was the only building in the vicinity. Thus, the most likely location for the capture of the gun depicted in these photographs is an area called Ring Contour 25 (25 masl). This position was considered a vital part of the German defences and was attacked from the east by the Australians during the First Battle of El Alamein in July 1942 but without success and with heavy casualties (AWM 52 8/3/24 June/August 1942; Maughan 1966: 580–583; Serle 1963: 180–187). This small but significant elevation is located to the north and south of the coastal highway and to the east-north-east of the Blockhouse. The gun seems to have been positioned at the western end of this feature in an area centred on grid reference 8716 3037, but contemporary aerial photographs appear not to have survived. This location was within the area assigned to the 9th Australian Division for salvage work after the Second Battle of El Alamein (AWM 52 1/5/20 October/November 1942, appendices; AWM 52 1/5/22 November/December 1942). Having established this general location, it might be possible to determine which Australian Army units captured the gun (fig. 7).

Reconstructing the Historical Context of the Puckapunyal Gun

Because the Puckapunyal gun is the same as the gun pictured in the historical photographs, a chain of custody can be suggested from the surviving historical documents.

The gun has been at Puckapunyal, Victoria, since at least 1952. In 1948, it appears that it was in storage at 5th Base Ordnance Depot, Liverpool, New South Wales (AWM 315 748/003/018). It was used in 1945 as part of a mobile exhibition of German, Italian, and Japanese equipment in Tasmania, during the Third Victory Loan (War Bonds) campaign. This exhibition took place from 14 March to 10 April 1945 (NAA P617 471/1/54); the gun being displayed in Hobart, Launceston, and other places, according to press reports at the time. Newspaper advertisements mention that the equipment displayed was also in use by the Army for 'experimental research' (*Mercury* [Hobart] 12–14 and 16–17 March 1945). The exhibited gun was presumably one of those mentioned by

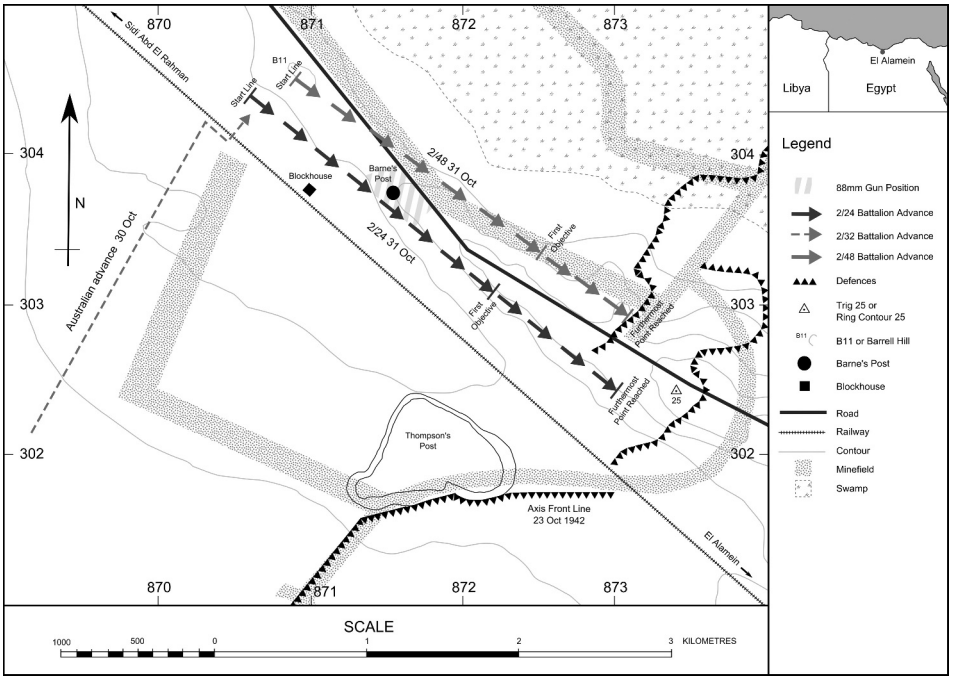

Fig. 7. Map showing part of Second El Alamein battlefield, indicating location of the 88 mm gun seen in Figures 4–6. (Drawn by Gerard Clifton after W.D.R. 1011/2741 1: 25,000 map; AWM 52 8/3/24 September – October 1942; AWM 52 8/3/35 October 1942; AWM 52 8/3/36 October 1942; Serle 1963: 195.)

a Sydney newspaper in 1943, which reported that two 88 mm guns had been transported from North Africa to Australia and that they had been recovered from the battlefield at El Alamein (*Sun* [Sydney] 25 March 1943: 5). The other gun is now in the Australian War Memorial, in Canberra. One of these guns was transported on the SS *Cornwall Castle*, a ship which carried Australian troops from Port Said, Egypt, arriving in Sydney on 23 March 1943. It was used to supplement the ship's armament during the voyage (AWM 97/0948; NAA SP729/2 1943; *News* 10 March 1943: 11).

It is therefore most likely that the Puckapunyal gun was captured at the Second Battle of El Alamein in 1942. Correspondence suggests that in August 1942, no 88 mm guns had been allocated to the Australian Military History and Information Section (Middle East) after the First Battle of El Alamein (AWM 315 743/001/007), but by 17 December 1942 after the Second Battle of El Alamein two such guns were in their custody. It appears that the General Officer Commanding, rather than the Military History and Information Section that was responsible for the collection of war trophies (AWM 54 492/2/7), had

Fig. 8. Historical photograph 6. Recovery of the 88 mm gun from the Second El Alamein battlefield by members of the Australian 2/3rd Pioneer Battalion, November 1942. (Anderson Collection.)

personally selected these two guns for shipment to Australia (AWM 315 745/001/001). This suggests that they had a particular significance. According to a manifest, by 5 January 1943 these guns were probably located at 6th Army Ordnance Depot, Dekheila (west of Alexandria), Egypt (AWM 315 748/026/001). While other details of how these guns had been obtained are unknown, documentary evidence suggests that on 15 November 1942, an 88 mm gun passed through the 2/1st Australian Army Field Workshop (also west of Alexandria) and was delivered to 6th Army Ordnance Depot on 30 November (AWM 52 14/2/1 November 1942).

Some of the Second World War photographs showing the Puckapunyal gun depict its recovery, and these photographs belonged to members of the 2/3rd Pioneer Battalion of the 9th Australian Division (fig. 8). It therefore seems likely that this could be a gun that this unit recovered. Such work would have been typical of the Pioneers, who served as both infantry and in an engineering support role. The salvage of an 88 mm gun is documented in the 2/3rd Pioneers War Diary (AWM 52 8/6/3 November 1942) as having been carried out on 15 November 1942, coincidentally the same day that an 88 mm gun arrived at the 2/1st Australian Army Field Workshop. The recovery of the 88 mm gun is described in some detail in the Battalion's history (Anderson & Jacket 1955: 328).

This includes the following:

> Then there was the 88 mm German gun which the Pioneers had collected. It had been set up on the hill near Tel el Eisa and they had to get it out. There were no tractors available … four trucks, each with two tow ropes, managed to salvage the prize.

Also according to this account:

> It was thought that the gun had gone the way of all other captured guns, but the Pioneers on their return to Australia some months later were astonished to see that very same 88 mm gun mounted at Circular Quay in Sydney with their names and regimental numbers still intact where they had been scratched on it in the western desert.

Unfortunately, the subsequent removal of the paint by sandblasting would have removed such evidence. Moreover, at the time of writing none of those involved in these incidents were left alive, but presumably this was the gun on display at No. 2 Jetty, Circular Quay, from 27 April to 3 May 1944, as part of a First Victory Loan exhibition of captured enemy equipment (*Sydney Morning Herald* 27 April 1944: 3–4; 28 April 1944: 4).

Numerous 88 mm guns were present on the Second El Alamein battlefield but the position of the gun photographed at Ring Contour 25 would have given its crew a full view of the coastal road, railway and the Australian advance across the flat almost featureless desert. Enemy in this location had caused considerable damage across the Australian front with enfilade fire. Therefore Ring Contour 25 and its defences had to be attacked and this was done on the night of 30/31 October 1942. The aim was to destroy the enemy in the coastal sector and cut off the German 125th Panzer Grenadier Regiment of the 164th Division (under the control of the 90th Division from 29 October), and other supporting German and Italian forces (IWM EDS AL 879/1; IWM EDS AL 881). This was to be done by driving the enemy from the area that extended from the railway to some way north of the coast road and capturing the defences at Ring Contour 25 (AWM 52 1/5/20 October/November 1942, appendices; Glenn 1960: 214–215).

The attack was made by elements of the 9th Australian Division 26th Brigade, consisting of the 2/24th and 2/48th Battalions, the former advancing between the railway and the coast road and the latter advancing north of the road (fig. 7). After breaking through the enemy frontline further south and moving northwards, the Australians were then behind parts of that line. This time they attacked Ring Contour 25 from the west, whereas in July it had been attacked from the east. The attack commenced from west of the Blockhouse and advanced in a south-easterly direction for 3,800 yards (3,475 m) towards Ring Contour 25. The advance was preceded by artillery fire from 360 guns, concentrating on known enemy locations and also providing a creeping barrage to cover

the advance of the two battalions (AWM 52 1/5/20 October/November 1942, appendices; Maughan 1966: 708). It is conceivable that this barrage damaged the gun under consideration. The 2/24th Battalion Diary records that amongst equipment captured on the night of 30/31 October was one 88 mm gun with 100 rounds of ammunition and two 20 mm Flak guns (AWM 52 8/3/24 September/October 1942). Similarly, the 2/48th Battalion Diary entry for the same night states that one 88 mm gun was destroyed (AWM 52 8/3/36 October 1942). These two 88 mm guns were amongst four such guns captured by the 26th Brigade during the operation (AWM 52 8/2/26 January 1943, part 2 of 2).

Having moved forward at 1.10 am on 31 October, B Company 2/24th Battalion encountered difficulties 500 yards (457 m) from the start line. Heavy losses were sustained when Sergeant Dingwall's platoon attacked three machine-gun posts, and remnants of three platoons including Dingwall's captured an enemy position (since known as "Barnes' Post" [Serle 1963: 195, 216]) based on an anti-aircraft gun. The latter was described in the Battalion Diary as a 20 mm Flak gun (AWM 52 8/3/24 September/October 1942) but according to the Official History it was an 88 mm (Maughan 1966: 713) and if so could have been the gun now at Puckapunyal. Sergeant Dingwall was subsequently awarded the Distinguished Conduct Medal for his leadership in this action and during attacks that took place on a number of previous nights (AWM 52 8/2/26 January 1943, part 2 of 2; Johnston & Stanley 2006: 216–217; Mackinlay 1992: 24–25). The 88 mm gun that was destroyed by B Company 2/48th Battalion was presumably north of the road, in a different location (AWM 54 527/6/10 part 1 and 2; Glenn 1960: 165; Johnston & Stanley 2006: 219; Mackinlay 1992: 58–59; Maughan 1966: 714). However, an intelligence summary dated 4 November recorded that 'daylight patrols along main rd to 872 easting disclosed an 88 mm badly damaged by a 2 pr shell and 2 20 mm guns' (AWM 52 1/5/20 November 1942). The location of this 88 mm gun, its association with two 20 mm guns, and the damage mentioned on the 88, suggests that this was almost certainly the Puckapunyal weapon. In contrast to the Allied sources, there appear to be no German records that mention the loss of these two 88 mm guns, although surviving German records of the battle are scanty. The *Afrika Korps* Diary only states that the enemy had reached the railway line and had advanced along it to the rear of the 125th Panzer Grenadier Regiment (AWM 54 423/4/103, Part 105). Other German sources only provide further general accounts of the action (IWM EDS AL 879/1; Liddell Hart 1953: 314).

Given the ferocity of the fighting in which these guns were captured, and the cost in casualties to both sides, it would seem likely that the least damaged of the two guns, the one at Barnes' Post, would have been the gun selected for historical preservation, as the photographic evidence indicates. Some of the damage that it

had sustained could have resulted from the artillery bombardment preceding and during the attack, but it was an approximately 40 mm armour-piercing projectile fired from a different direction that put it out of action. This damage to the left side indicates that the 88 mm gun was also engaged by an unidentified Allied gun from an arc between south-west and south-east, as well as by the Australian attack coming from the north-west. It is possible that it was hit by a shell fired by a gun belonging to the Australian 2/3rd Anti-Tank Regiment as they advanced from the south-west towards the B11 (11 masl) feature (fig. 7). A photograph of an 88 mm gun in the course of recovery, claimed to have been put out of action by this regiment, is almost certainly of the Puckapunyal gun ('Silver John' n.d.: facing p. 240) but the Anti-Tank Regiment was mostly equipped with 6-pounder (57 mm) guns (AWM 52 4/4/3 October 1942; Horner 1995: 325). A direct hit by a 40 mm projectile would probably have caused serious casualties amongst the gun crew, if the gun had not already been abandoned. There is, however, no record of the fate of the German crew, although some of the prisoners taken during the night of 30/31 October belonged to the *Luftwaffe* 1st Battery, 6th Flak Regiment of the 19th Flak Division (AWM 52 8/3/23 October 1942, appendices, part 1 of 3).

Conclusion

The Puckapunyal gun is a good example of a museum artefact for which there was little contextual information, except that it was collected in North Africa in 1942, probably after the Second Battle of El Alamein. It lacked an integrated documentary record of its movements and, given the chaotic conditions of a battlefield, particularly at night, and subsequent salvage, reuse and recycling, this is not surprising. Furthermore, recent enquiries have revealed that all those directly involved in its capture and recovery are now deceased, so that oral sources are no longer available. However, Sergeant David Anderson of the 2/3rd Pioneer Battalion, who took historical photograph 15 (Table 3) although not involved in the salvage of the gun, recalled (in 2008) that 'the battle was so chaotic that you wouldn't know who hit who' and that he 'wouldn't know one gun from another'. Interviewed in 2009, Gunner Ted Boyd of the 2/3rd Anti-Tank Regiment said, about the night when the gun was captured, that 'everyone was firing at everything and afterwards there were multiple claims' on some targets. Nevertheless, he could remember four 88 mm guns in the vicinity of the Blockhouse.

In such circumstances, an archaeological analysis of this weapon and of its components, particularly focussing on damage, can link it to photographs of a gun captured at the Second Battle of El Alamein in October to November 1942.

It is then possible to relate this photographic evidence to documentary accounts of part of that battle and its aftermath. In this way, the chain of custody of this artefact can be reconstructed and its identity on the battlefield restored, although questions remain about some of the details. Information can also be provided about its complex series of contexts over time, by combining the physical and documentary evidence.

Our paper is a reminder that museum artefacts of uncertain origin can have more light thrown on their changing contexts, if archaeologists give close attention to the physical evidence that they provide. This is the case with artefacts of conflict, whose survival is often accidental, just as with those relating to other aspects of the past. Rather than merely being displayed as historical props, pieces of stage scenery as it were, as is the case in many museums, such artefacts merit much more archaeological attention because of the potential information that their physical details can yield.

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