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The Battle of Hamel: An 'All Arms Battle' or 'AIF Small Arms Fire Superiority'?

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ABSTRACT
This paper examines the origins and evolution of Australian Imperial Force (AIF) *overhead machine gun fire tactics and how success correlated not just with its presence, but failure in its absence, throughout the First World War. The machine gun tactics used in the capture of the northern half of the Hamel objective on 4 July 1918 are used as an example as to why this correlation may also be causal.*

Introduction

One of the greatest tactical constraints during the First World War was overcoming water-cooled, recoil-operated machine guns used in defense. These guns were based on Hiram Maxim's 1884 patent and could be found distributed in all theatres. Often used in depth and with interlocking fields of fire they proved a major tactical obstacle to attacking forces.[1] How the troops of the AIF overcame at least 171 of these weapons at the 1918 Battle of Hamel has long been interpreted through the lens of that battle's architect, Sir John Monash.[2] He likened his role in the Battle of Hamel to that of a conductor of a symphony where 'the various arms and units are the instruments, and the tasks they perform are their respective musical phrases'.[3] However a detailed analysis of the machine gun tactics used by the AIF in the later battles of 1918 suggests that suppression of German MG08 machine gun fire was

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[1]As distinct from gas driven weapons such as the Lewis and Colt M1898 guns which are, technically speaking, automatic rifles rather than machine guns. The Germans did not widely use automatic rifles during the war and relied almost exclusively on weapons based on Maxim's design.

[2]171 MG08s and the lighter bipod mounted MG08/15s were captured at Hamel.

[3]Sir John Monash, *The Australian Victories in France in 1918,* (London: Hutchinson, 1920), p. 56.

achieved by Vickers machine guns grouped in batteries connected via telephone, visual means, and wireless, and operating under centralised control. Such batteries became in effect a single, much larger weapon that was used by the 4 Australian Division to target points of resistance during its advance. It was through this and other tactics that the 4th Australian Machine Gun Battalion (4 AMGB) exerted small arm's fire superiority over their German counterparts during the latter stages of the war on the Western Front in 1918, a period now referred to as The 100 Days.[4]

A detailed study of the wartime service and tactics of the author's grandfather, Lt. Bernard O'Reilly and his unit, the 12th Australian Machine Gun Company (12 AMGC) yields two notable observations, that they, and other machine gun units, became demonstrably more skilled at avoiding artillery fire as the war progressed, and that their use of overhead machine gun fire can be correlated with success in attack while an absence can be correlated with failure.

It should be noted that long range artillery is largely ineffective at suppressing the fire of handheld weapons because they are difficult to locate and, even if you can, they are difficult to eliminate, especially when well dug in.

From the AIF's first days at Gallipoli in 1915 their machine gunners had also noted how large calibre naval shells often hurled 'men high into the air' but 'fortunately, no one was hurt'.[5] Similarly, AIF Machine Gun Company (MGC) units engaged on the Somme in 1916 noted how few casualties they suffered there despite the intensity of the shelling.[6] Though artillery is generally accepted to have been the First World War's principal killer, it rarely eliminated the machine guns of 12 AGMC when they were dug in. Nor could artillery expect to destroy the shell holes which both side's machine guns frequently used as protected firing positions away from the trench system.

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[4]See Battles of Hamel, Amiens and 18 September. The National Archives (hereinafter TNA) WO 158/332, Narrative of Machine Gun Operations IV Army April to November 1918 Part 1.

[5]George Franki & Clyde Slatyer, *Mad Harry – Australia's Most Decorated Soldier*, (Sydney: Kangaroo Press, 2003), p. 244.

[6]Australian War Memorial (hereinafter AWM) AWM4 24/6/6 1st AMGC War Diary, 21 July 1916; AWM4 24/7/3 2nd AMGC War Diary, 26 July 1916; Lt WA Carne, I*n Good Company – Being a Record of the 6th Machine Gun Company A.I.F 1915-1919*, (Melbourne: 6th Machine Gun Company (A.I.F.) Association, 1937), p. 85; Clifford Sharman, 'Memoirs of Private 1172 Clifford Sharman, 26th Battalion, AIF, Part 1,' *DIGGER*, No. 78, (Dubbo, NSW: Families and Friends of the First AIF Inc, March 2022): p. 3-14.

At no time during the war did German artillery exert any significant interference on 12 AMGC's fire. Under their heaviest bombardment of the war, only 4 out of the Company's 16 guns were suppressed during major counter attacks to retake the Pozieres Ridge between 5-7 August 1916.[7] This suppression of only 25% of the machine guns on a brigade front was well short of the at least 80% that was achieved in the success at Hamel and other 100 Days battles.[8] Holding the high ground near where the Pozieres Tank Memorial now stands, then Corporal Bernard O'Reilly was 'repeatedly blown in' and buried, including twice while firing, but he retained his grip on the weapon, and soon after he and another survivor quickly ended an attempt by the 1st Company of German Infantry Regiment (IR) 63 to recapture *Höhe 161*.[9] Their experience was that high explosives were not particularly effective against dug in machine guns, and cover from shrapnel could easily be achieved by keeping low, while gas rarely, if ever, knocked out an entire crew and weapon.[10] Only while moving in the open with heavy loads were they vulnerable to artillery, and in particular to shrapnel.

However, machine guns were susceptible to suppressive fire from other machine guns because their projectiles did not explode on impact, so it was not exactly clear either when these intermittent barrages of bullets had started or when they had finished. Artillery fire can be seen and heard from miles around, while machine gun fire is heard and felt only by those under fire, often leading them to believe they are under observation when in fact they might only be reference points on a map. Furthermore, with their long narrow beaten zones, a battery of machine guns suppresses fire over a much larger area than an equivalent number of artillery pieces.[11] This fire remained largely unreturnable as the recipients had no way of determining the exact point from where that fire was coming.[12] By Third Ypres in 1917, the German High Command

[7]AWM4 24/17/5 12th AMGC War Diary, 5-9 August 1916.

[8]At Hamel, less than a dozen machine guns are reported as opening fire during the battle on the Australian 4 Division front. A similar number occurred on the Australian 2 Division front out of a total of 177 MG08s captured, plus an unknown number withdrawn in the face of advancing enemy.

[9]Pte. F.F. Wood MM. 'other survivor'; AWM28 1/180 Part 2, Cpl Bernard O'Reilly, Medal citation for Russian Cross of St George; Jack Sheldon, *The German Army on the Somme 1914-1916*, (Barnsley: Pen & Sword Military, 2016), pp. 230-234. Account of Lt Zinnemann in attack on *Höhe 161*, the site of Tank Memorial at Pozieres,

[10]Machine gun crews were usually issued the best respirators available, mostly box type when available.

[11]At Third Ypres in 1917 eight Vickers were used to cover a 250 yard x 250 yard square area.

[12]A change in fall of less than 1° at 1,500 yards range equates to more than a 100 yard difference using Mark VII ammunition. That is to say, it is very difficult for someone

had been forced to use low flying aircraft in attempts to spot the muzzle flashes of such machine gun batteries.[13]

By 1918, both sides were making extensive use of overhead fire to suppress enemy machine gun defences. During the *Kaiserschlacht* of 1918 at the Second Battle of Dernancourt, two sections of 24 AMGC were pinned down by long-range machine-gun fire and eight Vickers guns were captured without firing a shot in two separate actions by elements of the German 3 Jäger Battalion and RIR 262.[14]

The development of overhead machine gun fire

The 4th, 12th, 13th and 24th AMGCs were part of 4 AMGB, whose commander was at that time probably the most famous man in the AIF, Lieutenant Colonel Harry Murray VC CMG DSO and Bar DCM. Murray had been a lance corporal at Gallipoli when two British Army graduates of the School of Musketry at Hythe, Captains Jessie Wallingford and John Rose, first 'brigaded' the Anzac Division's machine guns together in the opening weeks of the campaign.[15] This grouping of machine guns acting as a single weapon took place six months before 9 (Scottish) Division and 47 (London) Division did at Loos and was well over 12 months before the rest of the British Expeditionary Force (BEF) formed MGCs in 1916.[16] This put the Australian 4 Brigade and its subsequent formations, on a tactical evolutionary pathway that would end as a text book example, given by Field Marshall Archibald Montgomery, as to how machine gun operations were conducted by the Fourth Army during the 100 Days.[17]

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under fire to determine whether a stream of bullets is arriving at 3 or 4 degrees to the horizontal, being the difference between 1,500 and 1,600 yards range.

[13]CE Crutchley, *Machine-Gunner 1914-1918,* (Northampton: Crutchley, 1973), p. 110; Mjr HT Logan MC and Capt MR Levey, *The History of the Canadian Machine Gun Corps*, unpublished manuscript, (Ottawa: Canadian Expeditionary Force – War Narrative Section, 1919), p. 206.

[14]AWM30 B10.5, Cpl CW Lane and Pte RC Ruschpler, Statement by Escaped Prisoners of War, 30 April 1918.

[15]Comprising New Zealand forces and the Australian 4th Brigade under then Col John Monash.

[16]Lt Col Graeme Seton Hutchinson, *Machine Guns – Their History and Tactical Employment*, (Uckfield: Naval and Military Press, 2004), p. 141, 9th Division; SS147 Machine Gun Notes No. 2, Appendix 32 – Notes on Employment of Machine Gun Batteries During Recent Operations, September 1915, (Washington: War Department, Feb 1918), p. 234. 47th Division

[17]Maj Gen Archibald Montgomery, *The Story of the Fourth Army – in the Battles of the 100 Days*, (Uckfield: Naval & Military Press, 2008), Appendix J - Notes on Machine Gun Organisation and Tactics, pp. 334-335. Actions of the 4 AMGB 18 Sept 1918.

Despite battalion officers at Gallipoli wanting 'to use them constantly for any little thing', Wallingford and Rose recognised the enormous defensive advantage of a co-ordinated approach to the use of machine guns across the Corps front in the 'small range of ground' at Anzac Cove.[18] This reconfiguration took place sometime before 13 May 1915, and put all the Anzac guns well behind the front trenches in only three locations, and doomed all subsequent enemy attacks down the exposed forward slopes, thus solving the 'problem of Monash Valley' in a way not properly understood by the Official Historian.[19] These defiladed positions further back were much harder to hit with a high velocity weapon, thus making the fire more difficult to suppress and the position safer for the gunners, whose casualties had been high and who could not quickly be replaced. The 'cricket pitch' gap at the crest of the ridge, between the Allied held Quinn's Post and the Ottoman held Bomba Sirta, had more than a dozen guns pointing at it from at least five directions.[20] At no point during the campaign could either side effectively neutralise the fire of these positions which posed a much greater threat to an attack than the defenders in the trenches of the objective. Furthermore, both sides began training their guns on their own trenches, ensuring that if in the event of their loss, they could not be held for long.[21]

Wallingford, Rose and the quick learning Murray also knew that, unlike their commanders who desperately wanted the high ground, guns sited down low might have an advantage over those sited up high, an idea independently implemented six

[18]Mjr Jesse Wallingford, Personal Diary, Private Collection, entry 3 May 1915. 'any little thing'; Mjr. John Rose, Personal Diary, Private Collection, entry 16 May 1915. 'small range'; and entry 8 May 1915. Describes losing guns because they are too far forward.

[19]Rose, Diary, entry 13 May 1915. Map showing 4 Brigade machine gun positions in Monash Gully, four on Russell's Top, four at Pope's Hill and two at Steele's Post; C.E.W. Bean, *Official History of Australia in the War of 1914-1918*, Vol. II: *The Story of Anzac,* 3rd Edition, (Sydney: Angus & Robertson Ltd, 1935), Chapter IV The Problem of Monash Valley. Hereinafter OHA Vol II. Describes the seemingly precarious position due to the closeness of the trench systems of the two sides.

[20]Capt. Cyril Longmore, *The Old Sixteenth – Being a Record of the 16th Battalion, A.I.F., During the Great War 1914-1918*, (Victoria Park, Western Australia: Hesperian Press, 2007). Describes the trenches at Quinn's Post being separated by twenty yards 'the length of a cricket pitch'. Machine guns known to be aiming between Quinn's and Bomba Sirta were located at Russell's Top (Allied: 450 yds WNW), Pope's Hill (Allied: 200 yds NW), Chessboard (Ottoman: 400 yds NNE), Baby 700 (Ottoman: 800 yds NNW) and German Officer's Trench (Ottoman: 300 yds SSW).

[21]Q.M.T.M. "Reminiscences of a Staff Officer." *Chronicle,* (Adelaide, South Australia), 28 September 1933. p. 48.

months later by the 'fireman of the western front', Fritz von Loßberg.[22] He conceived the death traps into which the French fell in the 2 Battle of Champagne in September 1915.[23] By 1917, large parts of the Hindenberg Line, including the section attacked by the AIF at Bullecourt, were designed around this important principle.

Aggregated guns could also be used to exert small arm's fire superiority over the enemy during an attack, Wallingford used ten guns while Rose used eight in support of an ill-fated attempt to establish a continuous line on 2 May 1915.[24] As the 'Mad Major' Lt Col Graeme Seton Hutchinson observed,

> No high military authority at Gallipoli seems to have informed the War Office that the decisive factor in offensive warfare was the machine gun. The more the student examines ground and maps and dispositions the more overwhelming appears this contention as applied to Gallipoli.[25]

It was also found that in the hands of a skilled operator a stable tripod mounted weapon could be set to fire close above the heads of the forward troops. At Quinn's Post the parapet was frequently raked by their own guns from Russell's Top and Pope's Hill during attacks while the defenders tried to keep their heads down and deal with the occasional attacker that made it into the trench system, though few did.[26] This informally derived tactic proved to be superior to the standing orders to 'man the parapet' during an attack and led to an accumulation of bodies so thick in front of Quinn's it required an armistice to deal with the '8 acres of dead'.[27]

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[22]Timothy Lupfer, *The Dynamics of Doctrine: The Change in German Tactical Doctrine During the First World War*, (Fort Leavenworth, Ka: Combat Studies Institute, U.S. Army Command and General Staff College, 1981), p. 10. 'fireman of the western front'

[23]Fritz von Loßberg, *Lossberg's War: The World War I Memoirs of German Chief of Staff*, (Lexington: The University Press of Kentucky, 2017), p. 175.

[24]Paul Cornish, *Machine Guns and the Great War*, (Barnsley: Pen & Sword, 2009), pp. 66-67. Raymond Brutinel of the CEF claimed to have arranged the first barrage on 2 September 1915, four months after Wallingford and Rose; Wallingford, Personal Diary, entry 2 May 1915. 'ten guns'; Rose, Diary, entry 8 May 1915. '8 guns.'

[25]Hutchinson, *Machine Guns,* p. 169.

[26]AWM S0118 Pte William Fitzpatrick MM, Interviewed 1974. 'We stayed in the trenches, but weren't allowed to look over. No not allowed to look……and our machine guns just wiped them out. I can see it happening now'.

[27]AWM4 1/25/2 PART3 General Staff Headquarters Australian and New Zealand Army Corps War Diary, May 1915, Part 3. p. 23. Memorandum Brigadier-General General Staff A. & N.Z.A.C to Headquarters Australian Division and N.Z. & A Division. Stating in reference to the deepening of the trenches at Quinn's 'this interferes

In 1917 the BEF adopted a safety margin of 60 feet clearance for overhead fire whereas during the 1905 Russo-Japanese war, the Japanese had found around 10 feet to be an acceptable risk.[28] It is not clear what clearance the AIF eventually used as no one seems to have written it down, but it was significantly less than the standing orders. During the complicated leapfrog manoeuvre at Messines the 12 AGMC appear to have allowed for about six feet or less.

The closeness of their fire was one of the sources of the tactical advantage they held over the Germans throughout the war. By comparison, it took until June 1918 for one German brigade to recognise its importance:

> Posts which are in shell holes or in the entanglement should get accustomed to our machine guns firing over them, as this fire is practiced for their protection.[29]

The extreme topography of Gallipoli had armed some, but not all, of the Anzac troops destined for the Western Front with different machine gun tactics to the BEF. From the start, success began to correlate with the close overhead covering machine gun fire that some of them had used at Gallipoli. A New Zealand Expeditionary Force (NZEF) raid on the night of 1-2 July 1916 found the Germans 'in a cowed condition, sheltering low behind the parapet'.[30] 1 Australian Division mounted the 'most successful' raid of the same evening under the cover of the 3 AMGC with four guns firing indirectly between 2,000 and 2,600 yards range placing an impenetrable screen of fire between the front and reserve trenches, a crude precursor to the 'SOS fire' that would be first seen around Pozieres later in the month.[31]

At this time elements of the German Army also experimented with overhead fire tactics, 4 AMGC noting three MG08s searching for one of their positions in early July

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considerable (sic) with the possibility of getting out of the trenches to meet a bayonet attack or to counter attack'; Stanley, *Quinn's Post,* p. 66. '8 acres of dead'.

[28]Lecture by Lieut. Col. R. V. K. Applin, D.S.O., 14th King's Hussars, British General Staff. January 10, 1918. *Tactics of the Machine Gun*. Infantry Journal, Vol XIV, No 10. (Washington, D.C.: The United States Infantry Association, April 1918), p. 758.

[29]AWM4 1/35/5. Australian Corps War Diary, July 1918, Pt 1, Appendix 10. Translation of captured German order.

[30]C.E.W. Bean, *Official History of Australia in the War of 1914-1918*, Vol. III: *The AIF in France 1916,* 4th Edition, (Sydney: Angus & Robertson, 1936 (hereinafter OHA Vol III), pp. 272-3. ' low behind the parapet'.

[31]OHA Vol III, pp. 272-3. 'most successful'; AWM4 24/8/5, 3rd AMGC War Diary, 1-2 July 1916. Machine gun scheme for raid; Cornish, *Machine Guns and the Great War*. pp. 67-68 & picture 12. Emergency Indirect Fire SOS fire taught at Grantham.

1916.[32] However this practice was discouraged under Falkenhayn and Ludendorff who both urged the conservation of ammunition until at least May 1917, leaving the Germans well behind in employing those tactics.[33]

The unexpected capture of Pozieres by 1 Australian Division, on the fifth attempt, led Gen Hubert Gough to make enquiries about the division's use of 'indirect fire from Maxims' and 'the system we had used with effect in Gallipoli'. Future Field Marshal and 1 Australian Division GSO3 Col Thomas Blamey gave a concise explanation of the mechanics of what they had done, adding,

> Information from prisoners showed that they suffered many casualties and were in constant dread of this fire.[34]

The German Reserve Infantry Regiment (RIR) 84 at Pozieres concurred:

> The 'English' also have built in covered machine guns, which graze the edges of our trenches with indirect fire. Our men pressed themselves against the trench walls and let the spluttering bullets strike into the mud only a hand's breadth away from themselves. Many a one is caught, mostly shot through the head or throat. In vain we wait for the ration party.[35]

In contrast, none of 2 Australian Division raids around Fleurbaix included this fire, with some machine gunners even participating as infantrymen during the attack.[36] Nor did this division use this tactic in its failed attempt on the Pozieres Ridge on 29 July 1916, despite 1 Australian Division's success in capturing the town. Birdwood would publicly blame the unbroken wire for their failure, but by the time of their second attempt on 4 August 1916, someone had added ten machine guns to give long range covering fire, four in enfilade and six front on, which again coincided with success in

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[32]AWM4 24/9/1 4th AMGC War Diary, 4 July 1916.

[33]Loßberg, *Lossberg's War*. p. 235. Falkenheyn emphasised tight fire discipline 'we must conserve our personnel and ammunition', Cornish, *Machine Guns and the Great War.* p. 103. 'By 20 May (1917) Ludendorff himself was endorsing the use of indirect fire'; AWM4 1/33/14 PART2 2 Anzac Corps Intelligence War Diary, June 1917. p. 10. Translation of German MG document underlined 'Ammunition is very valuable and can only be replaced with great difficulty'.

[34]AWM25 381/19 Gunnery – Notes and policy regarding the employment of machine guns. Correspondence between Sir Neill Malcolm, Cyril Brudenell White, Thomas Blamey and others about 1 Australian Division machine gun tactics, 7 August 1916.

[35]Carne, *In Good Company,* p. 88. Quoted by Carne from RIR84 history *(Klaehn)* from Pozieres around late July 1916.

[36]Ibid. p. 70.

the infantry capturing all their objectives.[37] 2 Australian Division had not arrived at Gallipoli until late August and some of their machine gunners had left the peninsular without even firing a shot.[38]

5 Australian Division, had numerous Gallipoli veterans in its formation from 1 and 2 Australian Brigades and were either overruled or had not considered the matter properly. Except for some direct flanking fire, then later during the withdrawal, few of its machine guns even opened fire during the AIF's worst disaster at Fromelles on 19 July 1916.[39]

In the first use of tanks advancing down *Höhe 161* on 15 September 1916, the New Zealand Division, the Canadian Corps and 47 (London) Division all used overhead covering machine gun fire in the capture of their objectives.[40] 47 Division achieved their feat 'without proper artillery support due a decision by III Corps'.[41] By the end of 1916, machine guns had begun to be organised at higher levels than brigade within the BEF.

Whilst the tactics also soon became commonplace in all AIF attacks, it was 4 Australian Division, who made the most significant advances towards the small arms fire superiority that was exerted over the Germans during the 100 Days. In particular 12 AGMC, whose first commanding officer was another Hythe graduate, Capt Edgar Sawer. His scientific approach and experience as part of the covering force landing at Gallipoli established a framework of disciplined learning and innovation that continued

[37]Ibid. p. 92. Company orders were to 'provide indirect fire on the second objective for two minutes after zero, then switch to a line covering the left flank of the attack'.
[38]Sharman, *Memoirs*. p. 3-14.
[39]AWM4 24/13/2 8th AGMC War Diary, July 1916; AWM4 24/19/1 14th AGMC War Diary, July 1916; AWM4 24/20/5 15th AMGC War Diary, July 1916. None make mention of any indirect fire and only one company gives fire orders for some direct flanking fire.
[40]Mjr J.H. Luxford, *With the Machine Gunners in France and Palestine – The Official History of the New Zealand Machine Gun Corps in the Great War 1914-1918*, (Auckland: Whitcombe & Tombs Ltd, 1923), pp. 38-45; Logan and Levey, *The History of the Canadian Machine Gun Corps*, p. 45; TNA WO 95/2732/4, 140th MGC War Diary, September 1916. p. 25. Three sections of 140 MGC giving overhead indirect fire; TNA WO 95/2744/3, 142nd MGC War Diary, pp. 47-48. One section 142 MGC giving overhead indirect fire; TNA WO 95/2739/1 141st MGC War Diary, September 1916. It is not clear whether two sections of the 141 MGC also engaged in indirect overhead fire. File 4, p. 109.
[41]*The 47th Division*. Stand To!, The Journal of the Western Front Association, Volume No. 32, 1992, p. 12.

throughout the war under subsequent commanding officers. Their biggest leap forward was made in the highly unusual circumstances at Bullecourt, where they participated in probably the largest 'artileriless' attack of 1917 when General Hubert Gough hurriedly ordered them to capture a large section of the newly constructed *Siegfriedstellung*.[42] On the 10 April 1917 62 (West Riding) Division, well supported by artillery and Liven's gas projectors, but unsupported by machine guns, attacked the fortified town of Bullecourt without making progress past the first line of wire.[43] The next day 4 Australian Division on their right, and supported by machine guns and thinly armoured training tanks, captured and held most of the first two lines for about six hours, before being forced to retire.[44] On the left half of the attack, 12 AMGC and other units under their control, had given sufficiently good covering fire for 46 Australian Battalion to capture its objective in less than an hour, having left half an hour late in near broad daylight while waiting for tanks that did not arrive on time, and when they did, opened fire on them after which they broke down.[45] 48 Battalion following had even less difficulty getting to the second line, despite a 1,000 yard advance into a re-entrant with the still occupied town of Bullecourt 300 yards on their left and the attack having 'enjoyed no tactical surprise whatsoever'.[46] Importantly, they

[42]A light bombardment was made on the town itself, but ceased at 5 a.m.

[43]Jonathon Walker, *The Blood Tub – General Gough and the Battle of Bullecourt, 1917*, (Staplehurst: Spellmount, 1988), p. 87. Wurtemburgers of the I/120 IR suffered almost 200 gas casualties 10 April 1917. 4 Australian Division had called off their attack 10 April 1917 because of the non-arrival of tanks but had failed to notify the 62 (West Riding) Division.

[44]C.E.W Bean, *Official History of Australia in the War of 1914-1918*, Vol. IV: *The AIF in France 1917,* 3rd Edition, (Sydney: Angus & Robertson, 1935), (hereinafter OHA Vol IV), p. 353. 'the unnerving discovery that German machine-gun bullets were passing through the steel sides'.

[45]AWM4 23/12/14, 12th Australian Brigade War Diary, April 1917. Report on Operations in the Left Brigade (Bullecourt) Sector 4th. Australian Divisional Front. Note 6. Doesn't state what time they leave but capture the first objective at '5.50am'; Jeff Hatwell, *Brave Days – The Fourth Australian Division in the Great War*, (Melbourne: Echo Books, 2017), p. 219. 'half an hour late' from the scheduled 4.30am start and tank arrivals; Ian Polanski, *The History of the 46th Battalion in The Great War of 1914-18*, (Townsville: Puttees and Puggarees, 1999). Tank opens fire on 46 Battalion; OHA Vol IV, pp. 305-306. Fate of tanks.

[46]AWM4 23/65/15 48th Battalion War Diary, April 1917. Report Lt McKenzie, 'passed through the enemy front line entanglements with ease and entered the enemies (sic) second line trench'. pp. 16-17; Jack Sheldon, *The German Army in the Spring Offensives 1917: Arras, Aisgne and Champagne*, (Barnsley: Pen & Sword, 2015), p. 220. 'no tactical surprise'.

had only come under 'direct rifle fire' from the trenches in front of the town.[47] Two thirds of 12 Australian Brigade's ammunition allocation for the battle, some 350,000 rounds, had been packed in belts and stacked next to six guns dug into the railway embankment only 300 yards from the German trenches, which fired more or less continuously for six hours.[48] It was an attempt at fire superiority by volume over individual ungrouped German guns with a local reserve of only a few thousand rounds. It was helped by the German machine guns being locatable and therefore suppressible by the 'form of the wire' in front of both the first and second line of trenches of the Hindenburg Line where 'no concrete emplacements' had been made'.[49]

What should have been crucial tactical information, that they had been able to suppress most of the MG08 fire and capture their reverse slope objectives with relatively few casualties, became in the brigade report 'heavy enfilade machine gun fire' and 'heavy casualties were suffered on reaching the enemy's wire which was found practically uncut and exceptionally strong'.[50] A similar thing would happen again to 12 Australian Brigade at Passchendaele on 12 October 1917, where its objectives were taken with light casualties and more than 200 prisoners 'coming in freely', becoming 'casualties were heavy during this advance' at the divisional reporting level.[51] Like

[47]AWM4 23/65/15 48th Battalion War Diary, April 1917. Report on Operation 11 April 1917. p. 10. 'an advance of 1000 yards had to be made before the 1st objective under direct rifle fire from the trenches east of Bullecourt'.

[48]AWM4 23/12/14, 12th Australian Brigade War Diary, April 1917. Report on Operations in the Left Brigade (Bullecourt) Sector 4th. Australian Divisional Front.

[49]AWM2018.785.69 Maps and aerial photographs relating to James Murdoch Archer Durrant. Detailed and high quality interpretive assessment of German machine guns defences around Bullecourt based on aerial photos and topographical maps by an unnamed machine gun officer(s). Possibly acting OC 12 AMGC, and later adjutant 4 AMGB Capt Harry Crouch MC. See also C.E.W Bean, *Official History of Australia in the War of 1914-1918*, Vol. XII: *Photographic Record of the War,* 11th Edition, (Sydney: Angus & Robertson, 1938), Plate 311. Hindenburg line, East of Bullecourt, 3rd April 1917. Aerial photograph of section to be attacked by 12 Australian Brigade. Plate 312. Key to Photograph on Opposite Page. Interpreted defence of Hindenburg Line to be attacked by 12 Australian Brigade. Plate 318 (also AWM E1408) The Railway Embankment Near Bullecourt. Photograph showing ammunition boxes behind railway embankment pp. 305-306.

[50]AWM4 23/12/14, 12th Australian Brigade War Diary, April 1917. Report on Operations.

[51]AWM4 23/65/21 48th Battalion War Diary, October 1917. Report on Operations of 12-14th October, 1917, p. 2. 'casualties during the advance were light and mostly caused by machine gun fire across the ROULERS RAILWAY'; Craig Deayton, *Battle Scarred – The 47th Battalion in the First World War*, (Newport, NSW: Big Sky Publishing

Bullecourt, it too had become a machine gun shoot out by the afternoon, this time however, the Germans had also begun to group their guns together.[52]

At Bullecourt, the men themselves only had a vague idea of what was going on, but it sounded 'like thousands of bees passing overhead' and that 'the air was dense with crackling bullets'.[53] The 10th and 11th companies of the IR124 on 12 Australian Brigade's front reported heavy casualties and intense machine gun fire from the British tanks that had strafed them with '6 machine guns simultaneously while moving back and forward along the trench line'.[54]

The significance of 12 AMGC attaining several hours of fire superiority over the Württembergers was lost to all but a few in the scale of the losses in the AIF's second worst day of the war. 4 AMGC on the right had also achieved early success and later failure but with much higher casualties using different tactics.[55] Half were wiped out carrying their heavy loads with the advancing infantry, the other half captured or killed due to an inability to get ammunition forward.[56] Alone in 4 Australian Division, 12 AMGC had a philosophy of keeping their guns well back and in touch with supplies and that while the infantry were moving they should be firing, something later strongly advocated by the Fourth Army DIMGU during the 100 Days.[57]

Pty Ltd, 2011), p. 173. 'the objective was reached with fairly light casualties' and 'coming in freely'; Report on Operations Carried Out by the 4th Aus. Division. 12th. October 1917. Note 2. 'casualties were heavy'; also AOH Vol IV, p. 924. 'and in spite of very severe casualties the 12th Brigade secured the first objective'.

[52]AWM4 1/48/19 Part 1. General Staff Headquarters 4t h Australian Division. October 1917, Part 1. p. 47. Extract From Second Army Intelligence Summary No 818. 14th October 1917. 'all reports received agree that the volume and intensity of the machine gun fire encountered by our troops on the 12th were far heavier than any recent battle day'.

[53]Knowles B, Reveille, Sydney: *Journal of the Returned Service League*, 30 April 1931, 'thousands of bees'; Lt George Deane Mitchell MC DCM, *Backs to the Wall,* (Melbourne: Allen & Unwin, 2007), p. 92. 'air was dense'.

[54]Sheldon, *The German Army in the Spring Offensives 1917*. p. 223. '6 machine guns'.

[55]OHA Vol IV, p. 343. The entire compliment of 16 machine guns of the 4 AGMC went forward with the infantry while the 12 AMGC only sent two guns forward some hours after reaching the objective. Casualties 4 AMGC (104) cf. 12 AGMC (14), 4 Australian Brigade (2,339 of 3,000 - 78%) cf 12 Australian Brigade (950 of 2,300 - 41%).

[56]OHA Vol IV. p. 303.

[57]DIMGU Divisional Inspector Machine Gun Units – Col Noel K Charteris, Fourth Army.

12 AMGC had become better than 4 AMGC as an unintended consequence of the intervention of Monash during the doubling in size of the AIF after Gallipoli. As 4 Brigade commander, he bragged about keeping all of his machine gunners from Gallipoli.[58] To make good the shortfall the 12 Australian Brigade sought out educated well to do Light Horsemen and commissioned them into 12 AMGC. Apart from the introduction of many excellent well-educated soldiers, this also gave them distinctly superior animal handling skills in comparison to not just 4 AGMC, but other machine gun companies formed from infantry battalions within the wider BEF. In late September 1917, Hutchinson describes the 'gargantuan' task of hauling forward 700,000 rounds (about 27 tonnes) by hand across the muddy ground at Third Ypres. Around the same time 12 AMGC, only a few thousand yards north of them, brought their battery ammunition forward undetected by the enemy using pack animals.[59] These unexpected skills enabled the 12 AMGC to get more ammunition forward than most other units, adding considerably to their effectiveness. Furthermore, with the notable exception of 12 October 1917, the 12 AMGC had their pick of the best men from the battalions to carry for them from 1917 onwards.[60]

It was only after Arras did someone in the War Office also make the curious observation in regard to machine gun barrages:

> There was no direct evidence of the destructive effect of this fire, but on every occasion on which it was brought to bear the objective was gained. No counter-attacks developed on this front.[61]

The Canadians had also trialled overhead machine gun fire as early as 1915 but their Colt-Browning M1895 'potato digger', technically a gas operated automatic rifle, overheated quickly and fired the first shot only 200 yards making it unsuitable for the

[58]General John Monash, *War Letters of General Monash*, Edited by Tony Macdougall, (Sydney: Duffy & Snellgrove, 2002), p. 101. Letter John Monash to his wife dated 14 February 1916. 'I shall lose none of my H.Q. or signals, or battalion Cos, or their H.Q. or machine guns'.

[59]AWM4 24/17/19. War Diary 12th AGMC, September 1917. Capt D. Martin, Report on Operations at Ypres 26th to 28th Sept 1917. Note 4.

[60]AWM4 24/17/20. War Diary 12th AGMC, September 1917. Capt D. Martin, Report on Operations near ZONNEBEKE from 11th to 14th October 1917. The carriers attached to the 12 AGMC for the success at Polygon 26 September 1917 were returned to their battalions and replaced with men of 'little or no use, as no reliance could be placed on them'.

[61]Summary of Machine Gun Intelligence No 1, May 1917, Issued by General Staff, War Office. p. 6.

task.[62] Its replacement with water cooled mechanically driven Vickers in August 1916, and the adoption of overhead fire tactics, coincided with a significant turnaround in Canadian fortunes before the end of the year.[63] By the time of their success at Vimy Ridge in April 1917, they were still relatively new to large scale machine gun operations and had underestimated barrel usage, resulting in noticeably thinning fire just eight minutes before zero hour.[64]

Importantly, they had also noticed these barrage guns could respond to front line SOS calls much sooner than could artillery, and this fire caused counter attacks to fail quickly and 'how the Huns melted away before it'.[65]

Throughout 1917, the tactics were quietly adopted by other units in the BEF, though some had already trialled it independently.[66] 62 West Riding Division was introduced to the tactics by the AIF at Second Bullecourt, where the number of machine guns had been doubled after the first failure by the 4 Australian Division.[67] By Cambrai in November 1917, they would make one of the best advances made by any unit and by making extensive use of the tactic.[68]

Around this time the French also became interested in what the Canadians had done. Their Official History credits 32 Corps, whose sector of the front was much hillier than further north, as issuing its first indirect fire orders as early as 6 May 1917.[69]

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[62]Raymond Brutinel, Interview - 18 October 1962, transcribed by Dwight Mercer, private collection. p. 31.

[63]Logan and Levey, *History of the Canadian Machine Gun Corps*, p. 15 and p. 27. Issuing of Vickers guns to Canadian Expeditionary Force (CEF).

[64]AWM25 385/6 Notes on the employment of Machine Guns in the Canadian Corps during the Operations leading to the Capture of Vimy Ridge. p. 4, point no. 9.

[65]SS146 War Department, Machine Gun Notes No. 2. Col Noel K Applin, Lecture *Machine Guns at the Battle of Messines*, Delivered at US Army War College, Washington DC, 21 November 1917. p. 34.

[66]TNA WO 95/2428/2. 100th MGC War Diary. Hutchinson, a veteran of the August battles at Suvla, issued indirect fire orders in May 1916; Andrew Whitmarsh, *The development of infantry tactics in the British 12th (Eastern) Division, 1915-1918*. (University of Leeds: Dissertation for Military History MA). Note 68. 'as early as January 1916'; Cornish, *Machine Guns and the Great War*. pp. 67-68 & picture 12. 'Emergency Indirect Fire' by 48 Division July 1916.

[67]1 Bullecourt used 51 Vickers guns while at 2 Bullecourt 96 were engaged.

[68]TNA WO 95/3083/4, 212th MGC War Diary (185th Bde.), November 1917.

[69] French Official History, Tome V, Vol. 2 Précis, p. 827 (Tirs Indirects des Mitrailleuses).

A sceptical General Group Armies Central, Emile Fayolle, ordered a position that had changed hands a number of times be captured using the cover of this fire alone.[70] Success 'without casualties' saw the French set up their own machine gun schools, including one next to Camiers, to teach the tactics.[71] On the 20 August 1917 the Morocco Division used overhead covering fire in the first successful French attack at Verdun along both banks of the Meuse and within months of widespread mutinies.[72] This caused much consternation and confusion for Ludendorff who observed that the turnaround in French fortunes had not been the introduction of tanks.[73]

Also influenced by the Canadians, success at Messines correlated with more than half of the Second Army's machine gun resources being dedicated to covering fire during the advance. Brigadiers reluctantly giving them over for the machine gun schemes to be organised at Corps level.[74] Success despite the preparatory bombardment causing only one casualty per 150 shells.[75]

There are few better examples of how the use of overhead machine gun fire correlated with success while its absence correlated with failure at the NZEF attack on the village of La Bassieville several days before the commencement of Third Ypres. This assault was 'very poorly supported by the artillery' and was 'an almost purely machine gun show', but successfully captured and consolidated the objective. However, its two barrage groups of twelve guns each were inexplicably withdrawn at 4.40 a.m. and the unexpected German counterattack that followed around 6.30 a.m. resulted in a rare loss of position by the New Zealanders.[76]

The BEF had further mixed results at Pilckem Ridge on 31 July 1917 leading to a demonstration at Camiers around 20 August 1917 given to Haig, his divisional commanders and above. In a bunker on the beach, all they could hear and see was spurts of sand and a patter of heavy hail and the faint rat-a-tat-tat of eight Vickers firing from over 2,000 yards away. None were keen to go out into the 260 x 60 yards of 'absolutely concentrated hell' around them. Haig asked for the fire to be put somewhere else and, within 1 min and 5 sec of the order being given, an unsuspecting

[70]Brutinel, Interview 1962, p. 31 (Tape 20 p3).
[71]Ibid. p. 31. 'without casualties' likely an exaggeration by Brutinel.
[72]Applin, Machine Guns at the Battle of Messines, p. 36.
[73]General Erich Ludendorff, *My War Memories,* (London: Hutchinson & Co, 1919. Vol ii,p. 479.
[74]Applin, Machine Guns at the Battle of Messines, p. 31. Applin was II Anzac MGO.
[75]Captain G. C. Wynne, *If Germany Attacks: the Battle in Depth in the West*, p. 268. Calculated from 40 casualties per day in regimental sector of 6,000 shells daily.
[76]Luxford, *With the Machine Gunners in France and Palestine.* p. 79.

white flag received a torrent of bullets.[77] It was a form of Command and Control that had not yet been seen.

Around this time, the British Official Historian also noted, 'machine gun barrages fired over the heads of the advancing infantry had now become universal in offensive operations'.[78] The history of 33 MGB noted 'the Third battle of Ypres had already begun, and so obsessed now was the higher command by the Machine Gun Barrage, that the Machine Gun Companies of every available division were crowded into line to support the offensive'.[79]

In late September and early October 1917, the AIF participated in a series of successful advances within machine gun range (under 2,000 yards) at the Menin Road, Polygon Wood and Broodseinde.[80] On the 4 Australian Division front at Polygon Wood, a significant number of officers of RIR229 were shot dead above the waist from machine gun fire, causing the unit to retire.[81]

Haig then ordered further advances, this time beyond machine gun range, at Poelcapelle and First Passchendaele on 9 and 12 October. On the 12 October, whilst initially successful in the atrocious conditions, many machine gun crews were wiped out in the open attempting to move with their heavy loads in the mud to support the attack on the second and third objectives. This left them with no effective SOS MG scheme, most glaringly on Monash's 3 Australian Division front, through which the Germans mounted a successful counterattack.[82] Ultimately both attacks were forced back to almost where they started, the NZEF suffering its worst day of the war. Both

[77]Applin, Machine Guns at the Battle of Messines. p. 61. Description of machine gun barrage demonstration.
[78]Cornish, *Machine Guns in the Great War.* p. 98. 'universal'.
[79]Crutchley, *Machine-Gunner 1914-1918,* p. 107. 'obsessed'.
[80]The range of Mark VII ammunition was 2,800 yards; however, the batteries were generally several hundred yards behind the front line. Advances beyond 2,000 yards required the batteries to move.
[81]Jack Sheldon, *The German Army at Passchendaele*, (Barnsley: Pen & Sword, 2007). p. 169. Included the local KTK and the 3 MGC commanders.
[82]AWM4 24/14/12. 9th AGMC War Diary. October 1917. Lost 7 guns: AWM4 24/15/13. 10th AGMC War Diary, October 1917. Lost 3 guns; AWM 24/16/1. 11th AGMC War Diary, October 1917. Lost 3 guns; AWM4 24/17/20 12th AGMC War Diary, October 1917. The 4 Australian Division on the right of 3 Australian Division had a shorter and narrower front and left their barrage group in place. Only two forward guns of the 12 AGMC were lost; Luxford, *With the Machine Gunners.* pp. 94-95. Forward MG groups remained at second objective position trained on SOS fire, while the barrage group did not move as ordered.

3 Australian Division and 12 Australian Brigade also suffered heavy casualties from being flanked and forced to withdraw.[83]

In early September 1917 the 3rd MGK of the IR19 began experimenting with firing into the back areas and supply lines of the British lines north of them at 2,000m range. This, they also found, brought 'considerable success'.[84] On 9 October, the German 16th Division used its attached *Maschinengewehr-Scharfschützen Abteilung* to fire an overhead SOS barrage against attacking troops of XVIII Corps.[85] By November 1917, one man from each company was being sent to Spandau for a course including instruction in barrage and indirect fire.[86]

Throughout 1917, the German Army had invested heavily in the weapon. In January 1917, they had some 16,000 MG08s across two fronts. By January 1918 this had grown to 32,000 MG08s and 37,000 MG08/15s, the vast majority concentrated or on their way to the Western Front.[87]

The Battle of Hamel

By mid 1918, 4 AMGB was as well placed as anybody to give covering fire to 'the most important minor operation carried out on the Fourth Army front between 25 April and 7 August'.[88] On 25 June 1918, Harry Murray was summoned to Monash's HQ and asked to devise a plan of machine-gun support for an attack at Hamel, aimed at capturing the village and the ridge above it.

Murray returned to his unit and immediately called-in and briefed his officers, who worked overnight reviewing maps and photographs of the battle area to work out a rough plan of attack, which was approved by Monash the next morning. Murray and his second in command immediately set out to reconnoitre the proposed positions. Returning before sunset, and having made up his mind, he sent 100 men of the 'B' crews forward after dark to commence digging positions they had practiced while blindfolded and covering over their work and tracks before dawn.[89] Importantly, he

[83]OHA Vol IV. p. 928. 3 Australian Division – 3,199 casualties. 12 Australian Brigade – 1,018 casualties.
[84]Sheldon, *The German Army at Passchendaele.* p. 150.
[85]Cornish, *Machine Guns in the Great War.* p. 103.
[86]SS201 Tactical Summary of Machine Gun Operations for October, 1917, Issued by the General Staff, War Office. Point 2.(a)(ii.).
[87]Logan and Levey, *The History of the Canadian Machine Gun Corps*, p. 11.
[88]Narrative of MG Ops IV Army, Pt 1. p. 6.
[89]AWM4 24/4/3. War Diary 4th AMGB, July 1918. Parts 1 & 2.

placed them away from known MG positions in seemingly unimportant non-descript parts of the front.[90]

The work on the seven-foot deep slit trenches was completed the next night, two for each gun. In the primary firing position, a stabilising T-piece was placed along with water and gun oil, while in the support positions 8,000 rounds of 0.303 bullets, loose in crates . The latter pits would be occupied by the reserve crews who refilled belts as needed and who also replaced any casualties in the primary crews. Both types of positions were manned by four men in each pit.[91]

Camouflage was of critical importance, as all of these positions were in the open, and were subject to both direct enemy observation from the Quarry and Wolfsberg, as well as aerial photography, which they assumed was scrutinised by the Germans as carefully as they themselves did with their own photographs.

Murray wanted to ensure that, once dug in and camouflaged, that no tell-tale traffic signs could be seen from the air, so sentries were posted to ensure no-one was permitted near these positions during the period 27 June and 3 July 1918. Not a single footprint would be trod in the area, giving the Germans no reason to suspect anything. Slit trenches dug at night, while under full view of the enemy during the day, had been trialled by 12 Division at Arras in April 1917, but this was first done on a large scale shortly after in June at Messines.[92] Whilst at Messines 'not a shell had landed on them all day', the 18 Pounder gun batteries, who had first choice of the cover behind Hill 63, received the bulk of German artillery response and took significantly more casualties.[93] Safety of the men, and therefore continuity of fire, had been achieved by hiding in plain sight, which gave better protection than steel or concrete ever could.

Further back the battalion's signals officer began the task of connecting these gun positions to the telephone system, using as many inter-connecting wiring patterns as he could devise. Positions were also chosen for visual signalling stations using Lucas lamps, a weather permitting back-up to telephone communications during the battle. Should the worst happen, and the telephone wires be cut, the gun crews in the batteries could still be in touch and their fire could be called upon within about 30 seconds. Communications were of critical importance to 4 AMGB and the unit ran its own signalling school from not long after its inception.[94]

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[90]Narrative of MG Ops IV Army, Pt 1. p. 7.
[91]AWM4 24/4/3. War Diary 4th AMGB, July 1918. Parts 1 & 2.
[92]Applin, Machine Guns at the Battle of Messines. p. 41.
[93]George Mitchell, *Backs to the Wall*, Angus & Robertson, 1937. p. 144. ' not a shell'.
[94]AWM4 24/4/2, 4th AMGB War Diary, June 1918. The four companies had two men from each continuously attending a rolling four week course.

Once completed the men spent their days resting for the exertion ahead, while some of the officers began the thousands of calculations needed to produce the simplified charts to be followed by the machine gun crews. These charts ensured their fire landed when and where it was wanted, whether the machine gunners could see the target or not and making it almost impossible for the Germans to suppress.

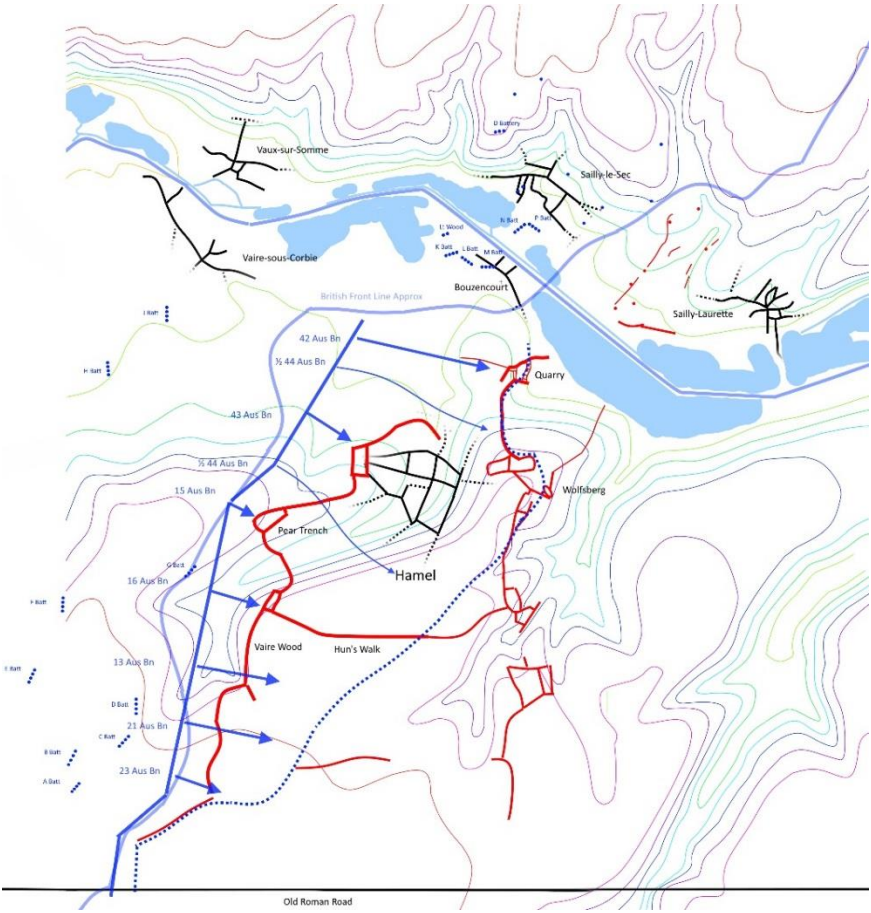

Figure 1: Topographical map of the northern part of the Hamel attack showing the proposed advance of the 11 Brigade and approximate positions of the machine gun batteries supporting the attack. Colours are 10m contours.

In the early hours before the attack, the gun positions were uncovered and occupied by the crews, who brought with them an additional 4,000 rounds loaded in belts, giving them 12,000 rounds each in total.

An inability to suppress German rifle and machine-gun fire from the Quarry and the Wolfsberg during the attack would be disastrous. These were deep strongholds with large stores of MG08s and MG08/15s (~25-30 in total) and large local reserves of ammunition (50-100k rounds). Without effective covering fire, the Australian infantry would be at risk of the Germans firing through the 18-pounder creeping barrage, a tactic in use since Arras, but they rarely had this opportunity against the Australians, and a study of Hamel shows why.[95]

Under the cover of the noise of 628 guns of the Royal Artillery, the Wolfsberg, Quarry and 'M' targets were put under steady machine gun fire from zero+3 minutes onwards.[96]

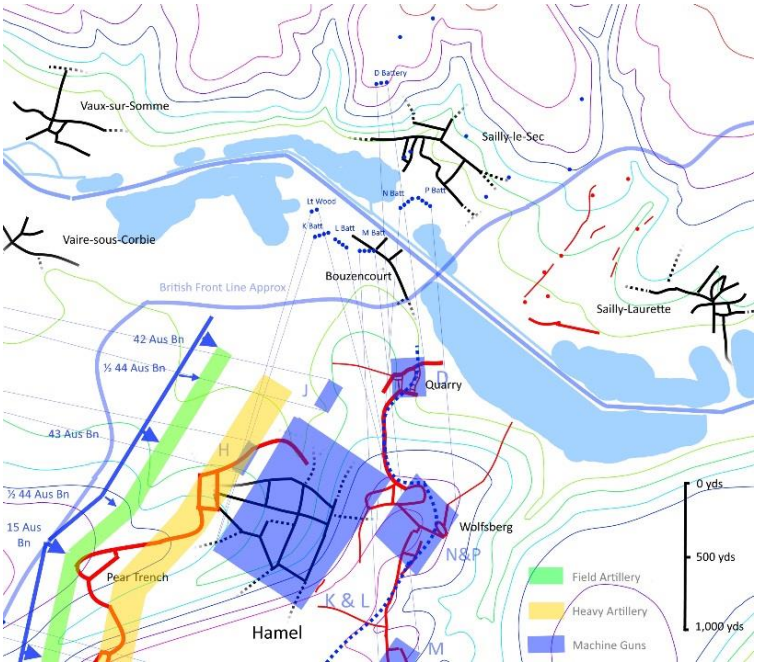

Figure 2: Covering fire for the 11 Brigade attack at Hamel z+5 minutes.

[95] Applin, Machine Guns at the Battle of Messines. p. 33.
[96] Narrative of MG Ops IV Army, Pt 1. p. 7.

Each battery worked as a single weapon. A battery could put concentrated fire on trenches and strong points or put much larger areas under desultory fire into which the enemy were reluctant to move. Interestingly, the fire on the Wolfsberg from "N" and "P" batteries was not particularly intense, only 200 bullets landing every minute on a 500 x 500 yard target. However, this was largely into an open trench system which restricted movement and caused the occupants casualties, even from ricochets.[97] Moreover, they landed in bursts of sporadic fire, leaving the defenders uncertain as to when this unreturnable fire might commence again. Importantly also, this rate could also be easily increased to 1,000 bullets per minute with a phone call.

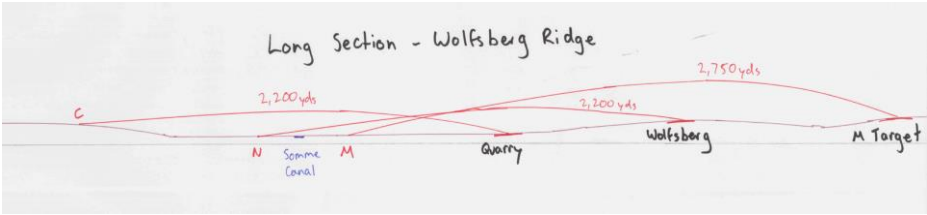

Figure 3: Long section view of MG fire North to South along Wolfsberg Ridge

As the creeping artillery barrage approached the standing MG barrages, their fire was switched to SOS lines.

[97]AWM4 24/3/5, 3rd AMGB War Diary, Jul 1918. p. 15. Statement of prisoner - ricochets.

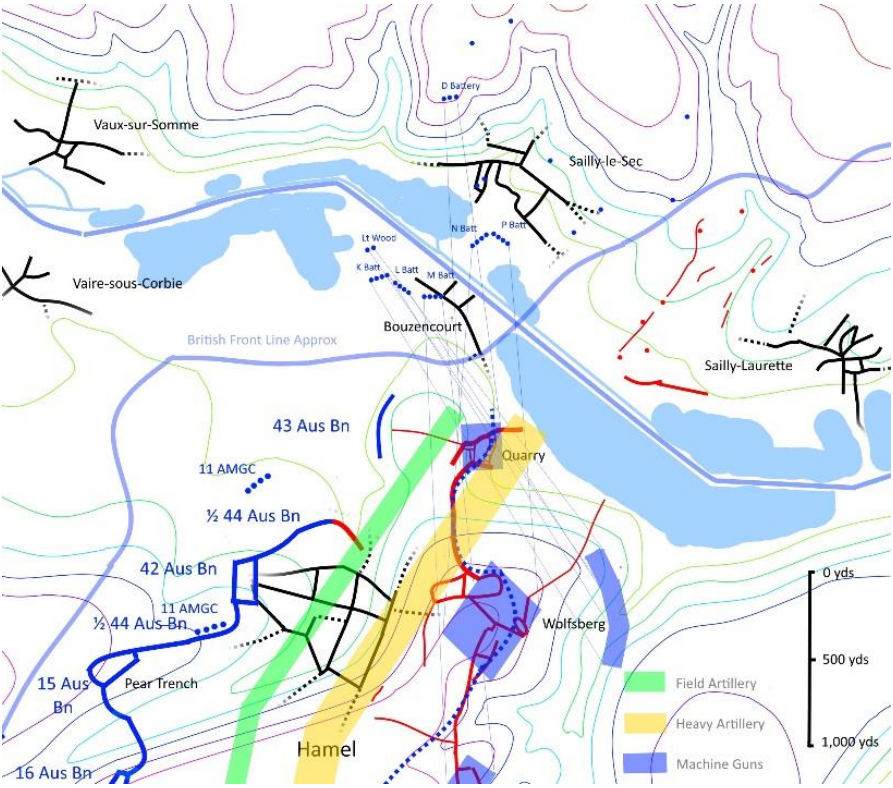

Figure 4: Covering fire for the 11Brigade attack at Hamel z+5 minutes.

The artillery barrage was halted midway for a period of ten minutes, during which a lot of things happened quickly. They established a forward headquarters in the newly won German trenches in front of the town, then began laying telephone lines, visual stations and a wireless setup back to the main interconnected telephone system that ran mostly deep alongside the Somme Canal. This gave them three reliable and near instantaneous communication links with the machine guns in the north and to the two batteries of four machine guns each of 11 AMGC that had also been quickly established on either side of the town. With 8,000 rounds apiece, these guns would put in covering fire on the Wolfsberg over the heads of 44 Battalion and the tanks in front of them as they advanced up the slope.

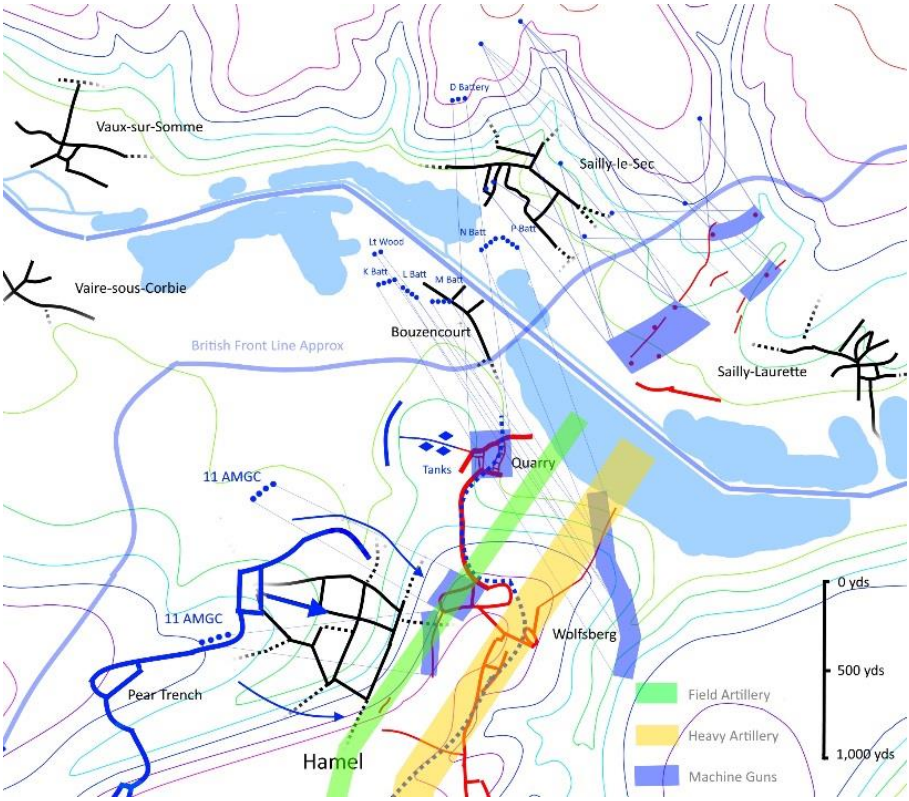

Figure 5: Covering fire for the 11 Brigade attack at Hamel z+60 minutes, including 12 AGMC suppressing fire North of Somme.

This part of the plan was similar to how the 3rd Jäger Battalion had captured some of Murray's guns without firing a shot at Dernancourt and the Wolfsberg was likely captured in much the same way.

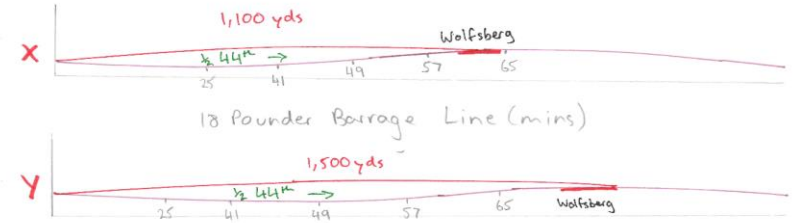

Figure 5: Long section views of 44 Battalion's advance under direct covering fire.

The Germans in the Quarry had also been pinned down from not long after zero hour by three guns of 12 AMGC high on the northern bank of the Somme. 42 Battalion's (3 Australian Division) officers leading the attack were in contact with their commander located near this battery and overlooking the battlefield. When at least one German machine gun opened fire, within 30 secs it almost certainly received machine gun fire from C Battery high on the northern bank of the Somme.[98]

Figure 6: Battery 'C' (12 AMGC) view from the Northern bank of the Somme River.

[98]Whilst the diaries don't explicitly state so, it seems unlikely such effort would have gone into connecting batteries by phone and then not use them.

While the infantry took cover, tanks were sent forward to the Quarry because they could operate safely in the presence of their own machine gun fire, however non-existent suspension made the tanks' machine guns inaccurate while moving and they had a very limited field of view, even when stopped. They could, however, run over the tops of these strong points, spinning around to finish the job, the only action observable by the infantry. 42 Battalion had only three men killed in the capture of the Quarry and at least one of them had been from friendly artillery fire.[99]

A deeper look into the capture of the Quarry reveals how much fire suppression was needed. On Gallipoli Murray himself had defended the crucial position at the Nek from 600 yards away and knew that defending fire need not come from the objective. According to the 12 AGMC diary, only five guns were used in direct support at Hamel, the rest were used for 'harassing fire' towards Sailly Laurette on the northern side of the Somme. This was done in conjunction with a feint by 14 Australian Brigade to occupy the front trenches 2,000 yards further north to give the impression of a much larger attack. This bland description gives the reader no great insight of how effectively they had been able to suppress MG08 fire during the capture of the Quarry.

They had identified six MG08s north of the Somme that could potentially fire on the Quarry from across the valley. No machine gun fire from that direction was reported during Hamel and all six were captured four days later in 12 Australian Brigade's 'peaceful penetration' of Sailly Laurette.[100]

After Hamel

In the weeks following the success at Hamel, 4 AMGB began to practice for 'open warfare'.[101] This practice showed its benefits soon after at Amiens, where they advanced with their entire left flank in the air across the Somme River. The superior tactics of the Australians would not only suppress most MG08's and MG08/15's, but also 22 artillery pieces overlooking and enfilading the entire Fourth Army advance high on the Chippilly Spur.[102] Something Murray satisfyingly described as 'enemy machine gun fire being completely neutralised' and that the notable achievement of 'complete

[99]Red Cross Missing Report, Lt Frederick Halord (sic) Sessarago. AWM 1DRL/0428.
[100]For much of Hamel and peaceful penetration MG plan see AWM4 24/4/3 PARTS 1 & 2 4th AMGB War Diary, July 1918; AWM4 24/17/29 12th AMGC War Diary, July 1918.
[101]AWM4 24/4/3 4th AMGB War Diary, entry 14 July 1918.
[102]Narrative of MG Ops IV Army, Pt 1. pp. 12-13; also Hutchinson, *Machine Guns*. p. 324. 'the 4th Australian Machine Gun Battalion, advancing in depth, formed a defensive flank covering 3000 yards and successfully kept down the fire of 22 field guns, severely harassing the attack, until our own artillery came into action and destroyed the hostile guns'.

superiority of fire' had been gained.[103] The Canadians south of them also described overcoming more than 7,000 yards of 'co-ordinated M.G. Defences permanently garrisoned' where 'the defensive battle became a fight for land marks in which Machine Guns only were engaged practically to the exclusion of other arms'.[104] Both had used direct overhead covering fire, largely in pairs and in ranges below 1,000 yards, to suppress MG08 and MG08/15 fire while the infantry advanced.

At Le Verguier, on 18 Sep 1918, the 4 Australian Division advanced 6,000 yards with its right flank mostly in the air. They achieved this despite being outnumbered and outgunned and their detailed MG plans being captured with the 5 AMGB commander while out checking overhead clearances for his batteries the night before.[105]

However, by this stage of the war the Germans had no answer to the AIF's machine gun arrangements and this is probably why Montgomery chose this particular battle for his example. The barrage of bullets on the final objective had 'amazed' a machine gunner of the German IR58 and a battalion commander captured earlier in the day stated 'the small arms fire was absolutely too terrible for words. There was nothing to be done but to crouch down in our trenches and wait for you to come and take us'.[106] Monash also pointed out, 'there is no record in this war of any previous success on such a scale, won with so little loss'.[107]

Furthermore, the Fourth Army did not believe the 'three phases could be concluded in one day', and yet the final objective was captured at 11pm without supporting artillery, after what the Fourth Army DIMGU, Lt. Col. NVK Charteris, described as 'a good example of a quickly organised barrage with successful results'. [108]

Charteris also described 20 guns of 4 AMGB having gained 'complete fire superiority' over the enemy on this 3,000 yard exposed flank and tried to draw attention to the

[103]AWM4 24/4/4 Part 2, p. 55. Notes 6 and 9. Lt Col Harry Murray. Unlabelled report on operations at Amiens.
[104]TNA WO-95-1073-6_1. Notes on Recent Operations Canadian Machine Gun Corps, pp. 81-84. Original emphasis.
[105]OFA Vol VI, p. 897.
[106]AWM25 923/28, Extracts from Reports, Fourth Army No. MG 23/59. 'amazed' and 'too terrible'.
[107]Monash, *The Australian Victories in France in 1918,* p. 219.
[108]John F O'Ryan, The Story of the 27th Division, Wynkoop Hallenbeck, (New York: Crawford, 1921), Ch. 15 p. 249; AWM25 923/28, Extracts from Reports, Fourth Army No. MG 23/59.

'excellent results' of them being able to protect, without hindering, the advance of the troops.[109]

Murray was extremely secretive about his men's successes. When rung in April 1918 and told Sergeant Cedric Popkin (24 AMGC), had probably shot dead the Red Baron, he responded, 'Good, tell him to shoot some more, that's what he's there for' and hung up, never referring to the matter again.[110] Murray's men, unusually in the AIF, practiced saluting for 15 minutes each day, mostly to keep staff officers away. While he did not like attention being drawn towards himself or his men, he was equally comfortable with his subordinates addressing him as 'Harry', though no one called him 'Mad Harry' to his face.[111]

These men shared little of what they did with anyone both during and after the war. It was, it must be said, an unpleasant business. At Hamel, hundreds of AIF servicemen queued up to view what appeared to be a 10-year-old boy dead from multiple machine gun bullet wounds in the stomach. Many, like the author's grandfather, would be haunted long after the war by what they had done.

When Murray was forced into a 'Victory Tour' with Monash and William Birdwood, he walked out without addressing the crowds that had largely come to see him, ending up in a remote Queensland station.[112] Machine gunners on both sides had killed in numbers not seen before in human history and this cast a long, silent shadow over many of their lives. Furthermore, Murray blamed the early failure and the unnecessary loss of good men at the Bloody Angle on the other two, writing 'our leaders still had something to learn' in this 'ghastly failure'.[113] At Bullecourt, Murray had begged for artillery support for hours which Birdwood had refused out of concern for hitting his own troops, then when finally authorised, did just that.[114] Murray would be forced to leave behind his wounded in another 'ghastly blunder', a humiliating experience for any

[109]AWM25 923/28 Lt Col NK Charteris, Examples of Successful Uses of Machine Guns. Notes A(10) & (11).
[110]AWM 3DRL606/270 part 3/1, pp. 16-17. Account of Maj Fred Hinton, OC 24 AGMC and commander of Popkin.
[111]AWM S01173 Reginald Colmer interviewed by David Chalk about his service with the 4th Brigade in the First World War. Colmer had served under Murray in the 13th Battalion. 'I always called him Harry'.
[112]Jeff Hatwell, *No Ordinary Determination – Percy Black and Harry Murray of the First AIF*, (Fremantle, Western Australia: Fremantle Arts Centre Press, 2005), p. 230
[113]Franki & Slatyer, *Mad Harry,* p. 247.
[114]Walker, *The Blood Tub – General Gough and the Battle of Bullecourt*, p. 101; OFA Vol IV, p. 340.

front line officer, let alone someone like Murray.[115] He did at least admire Birdwood for his frequent visits to the front line at Gallipoli.[116]

Monash, for his part, would give much credit to German machine gunners but barely mention the men who had demonstrated technical and tactical superiority over their more lauded opponents. In Monash's many after war writings he rarely, if ever, mentions Murray by name, despite their long history together and relative fame. Monash biographers mention Murray only in passing, some not at all. It suited both men because one wanted everyone to remember while the other wanted to forget and, it would seem, they were not fond of each other. Rose, at least, did not like that Monash never came near the front line, something he believed to be a crucial failing in the first few days of confusion at Anzac when it became clear their maps were inadequate.[117]

But the lack of recognition of the importance of covering machine gun fire went much further than petty personal dislikes. The conclusions drawn in the instructional pamphlet SS218 about Hamel, the only instructional pamphlet issued by the War Office about a single battle, makes no particular point about machine guns other than their co-operation with other arms in the 'success of the attack'.[118] Yet clearly, no other arm was as effective at suppressing more than 80% of fire from the strong points deep in the battle zone.

The Germans at Hamel also emphasised the importance of the role tanks had played in this unexpected loss, for which the division considered 'no occasion for any enquiry to be held'.[119] They list numerous other causes, none of which address the small arm's fire superiority the AIF and others could now exert over them.

Moreover, Monash's own description of his ordering of a creeping machine gun barrage 'advancing 300 yards ahead of the infantry' on 18 September 1918 was simply wrong.[120] Both 1 and 4 Australian Divisions had long preferred standing barrages on

[115]Franki & Slatyer, *Mad Harry,* p. 217.
[116]Ibid. p. 248.
[117]Rose, Diary, entry 4 June 1915. '…I noticed an absence of this by the C.O. and B.M. of the 4th A. Bde. In fact it is common talk that the only time they were seen to do a personal reconnaissance was on the day of the armistice'.
[118]*SS218 - Operations by the Australian Corps Against Hamel, Bois de Hamel, and Bois De Vaire, 4th July 1918*, p. 10.
[119]AWM47 111.05/1, Records of JJ Herbertson, p 194. 'no occasion'.
[120]Monash, *The Australian Victories in France in 1918,* p. 219; TNA WO 158/332, Narrative of Machine Gun Operations IV Army April to November 1918 Part 1, p. 38.

expected points of resistance, largely identified from aerial photography and reconnaissance from soldiers like Lt Bernard O'Reilly, who appears to have been responsible for the sector north of the Somme at Hamel.[121] They had tried creeping machine gun barrages sandwiched between the heavy artillery and the 18 pounder field guns at Third Ypres in 1917 and found this took away the uncertainty as to when it would start and when it would finish, which was the key feature of the tactic.[122] It is not clear whether the secretive Murray had even informed Monash of exactly what he was doing, indeed Charteris thought these standing barrages 'farther ahead of the 18-pdr. barrage than usual' to be 'the special idea of the 4th Australian Machine Gun Battalion'.[123] And yet an update to pamphlet SS106, Notes on the Tactical Employment of Machine Guns and Lewis Guns, in August 1917 specifically required attacks to consider using machine guns in set piece offensives,

> To provide during the advance an intense searching fire on the areas from which long range rifle and machine gun fire can be brought to bear on our infantry. The importance of this searching fire cannot be too strongly emphasised. The area to be searched will usually be from 1200 to 1800 yards behind the enemy foremost position.[124]

This was widely ignored during Third Ypres, where creeping machine gun barrages were generally used.

Whilst Monash stated with confidence things he appeared not to understand, others were outright contemptuous. The respected and highly influential Canadian artillery officer General Andrew McNaughton, who became Deputy Chief of the Canadian General Staff in 1922 and later Chief of the Canadian General Staff in 1929, believed them to have been wasting time and ammunition, even misusing the weapon:

States 'first phase fell 1,200 yards in front of the infantry' while 'that of the second phase 800 yards further forward'.

[121]AWM4 24/17/29 War Diary 12th AMGC, July 1918.

[122]AWM4 24/17/19, 12th AGMC War Diary, September 1917. Capt DSA Martin, Lessons Learnt From Recent Operations. Note 5. p. 16. 'it is considered some of the creeping barrage could be abolished'; Also, Applin, *Machine Guns at the Battle of Messines,* p. 33. Canadian MGO suggest to Applin before Messines 'he told me he did not bother much about creeping barrage'.

[123]AWM25 947/77. Lt Col NK Charteris, A Few Notes on the Actions of the Machine Guns of the Australian Corps on 18/9/18. Notes A(5) and I.

[124]AWM25 381/15. A. Solly-Flood. Notes on the Employment of Machine Guns, 28 August 1917. Late amendment to SS106.

> There is no evidence to show the machine-gun barrage was very effective. We must not distort history to carry forward the wrong conclusions as to the proper use of this important weapon. Significantly, such barrages were not used in the Second World War.[125]

Given McNaughton's own role in downplaying its importance between the wars its restricted use was not proof of its ineffectiveness. Whilst it was true the tactic was not widely used during the Second World War, mobile armour and the resulting more fluid front lines had by then diminished its effectiveness, its use was not unknown.

Figure 7: Vickers machine-guns of 2nd Middlesex Regiment, 3rd Division, fire in support of troops crossing the Maas-Schelde Canal at Lille-St. Hubert (St Huilbrechts), 20 September 1944[126]

[125]John Swettenham, *McNaughton: Volume 1, 1887-1939*, (Toronto: The Ryerson Press, 1968), 153n1.
[126]Imperial War Museum Photograph B 10144, Collection no. 4700-29.

Yet in November 1917 II Anzac Corps Machine Gun Officer, Lt. Col. RVK Applin, claimed in front of the U.S. Army War College that:

> The fact that after the Battle of Messines everyone was absolutely convinced throughout the British Army of the importance, the vital importance, of this barrage fire – so much so that Sir Douglas Haig himself, the Commander in Chief. Asked Colonel C___, who is with you today to arrange a demonstration for himself; and he ordered all his Army commanders, all his Corps commanders, and as many divisional generals as possible, to be present at the demonstration.[127]

Conclusions

It is not clear why the tactical handling of the most iconic weapon of the First World War has been omitted from historical analysis. The small arms fire superiority exerted over the German Army in many of the 100 Days battles seems to not warrant special mention from any of the senior commanders who wrote extensively after the war, nor from any official historian much beyond the footnotes.

And yet the idea of using automatic weapons to cover an advance of the infantry, something any modern day platoon commander would consider self-evident, did not generally exist as a military tactic in 1914 beyond Germans firing from elevated but suicidally exposed trees and platforms. We can perhaps also understand why these experimental tactics, which arose largely beyond the knowledge of, and at times against the orders of senior commanders, might not have been given the same historical credit as many of the top down tactical innovations that dominate the modern day narrative.

Australian military history books generally overlook the battle of 18 September 1918 and, if it is mentioned, will invariably refer to Monash's use of dummy tanks.[128] Indeed one Monash biographer going so far as to suggest that this and other 'tricks' had 'caused the quick capitulation of the enemy', making no mention that 'enemy machine guns were found in the trenches with their barrel casings pierced and their crews killed by machine gun fire' on the second objective.[129] That was something possibly even done by Lt O'Reilly and his three gun crew in support of the 45 Aus Bn's attack on Ascension Farm.

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[127]Applin, *Machine Guns at the Battle of Messines*, p. 34.

[128]Peter Pederson, *The Anzacs – Gallipoli to the Western Front,* (Sydney: Penguin Books, 2010). p. 438.

[129]Roland Perry, *Monash – The Outsider Who Won a War*, (Sydney: Random House Australia, 2004), p. x. 'quick capitulation'; Narrative of MG Ops IV Army, Pt 1. p. 41. 'barrel casings'.

Yet Monash had laid out the framework that allowed Lt O'Reilly 'independence of action' on that day from as early as June 1918.[130] Machine gunners in the Australian Corps were given 'tasks' rather than 'orders' in an early form of what today we would describe as 'mission command'.

The evidence presented here suggests that overhead supporting fire of machine guns in attack facilitated the 'bite' while the rapid response SOS arrangements demonstrably improved the 'hold' in set piece attacks by the BEF from mid 1917 onwards.

Evidence to prove or indeed disprove the hypothesis that these tactics were causal in the overcoming of the German Army in the field in 1918, lies in three main areas that might be researched.

Firstly, a comparative analysis of MGC war diaries across the BEF could be made to determine how well the use of these two tactics correlates with success and, perhaps more importantly, whether their absence correlates with failure. In particular during 1917, when these tactics become more common across the BEF. This data might then be compared to similar analysis of the changing tactics of the other arms of artillery, infantry and tanks.

Secondly, more detailed and thorough analysis of key battles can be made to include machine gun tactics and uses. In particular, the German unit archives might reveal detailed maps of the layout of their machine gun defences, onto which artillery and machine gun barrages can be placed in time and space to determine which weapon is suppressing the fire of any individual gun.

Thirdly, on notification of impending operations at Amiens, Harry Murray dispatched the author's grandfather, his batman and most trusted Sergeant, along with a similar group from 13 AGMC, to the small arms school at Camiers on 3 August 1918. Presumably they were sent to teach the school the successful tactics from Hamel, probably at the request of Charteris, who had been impressed with the plan at Hamel.[131] The records of the Small Arms School might indicate what was being taught there in August 1918. This analysis might reveal why, after the initial success on 8 August 1918, the German machine guns quickly regained their ascendancy. This pattern tended to repeat during the 100 Days and it seems likely being due to the forced relocation of their guns to new positions with no long term occupation evidence from aerial photography to reveal its location.

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[130]AWM 3DRL2316 Personal Files Sir John Monash 4 June to 24 June 1918.

[131]Sgt (later Lt) JF Coyle MM and Bar C de G and Lt T Douglas (13 AGMC); Narrative of MG Ops IV Army, Pt 1. p. 6.

To suppress the abundance of handheld weapons of the Germans in 1918, two things were needed. Firstly, an identification process for these difficult to detect weapons, and secondly the suppressive tactics that made it possible to attack without being torn to pieces as all sides had been in 1914, 1915, 1916 and much of 1917.

The noted German tactician Willhelm Balck agreed with nineteenth-century naval historian Alfred Mahan in that weapons technology can change overnight, while tactical doctrine, by its very nature, cannot, adding that his experience of the war was that 'bullets quickly write new tactics'.[132] At the very least, the reassessment of machine gun tactics during the First World War makes an interesting study of why it took four years for the BEF to adopt bottom up innovation, even if these tactics were not fundamentally causal to the later success.

[132]Wilhelm Balck, *Devlopment of Tactics – World War. Translated by Harry Bell,* (Fort Leavenworth, Kansas – General Service Schools Press, 1922), pp. 7-8, Mahan quote. p. 18 'new tactics'.