

4. Semi Open Warfare

Over the winter of 1916/17 I Anzac Corps, now consisting of four divisions, the 1st, 2nd, 4th and 5th, languished in the mud of the old Somme battlefield, fighting the cold and trench foot more than the Germans, with whom they conducted informal truces.¹ In this static trench warfare, the light trench mortar was a popular weapon and many infantry battalions formed additional unauthorised trench mortar batteries.²

In November 1916 the 3rd Division arrived in France and moved into the line near Armentieres, the "nursery" sector where the other four divisions had spent their first weeks in France. This brought the total strength of the AIF in France on 31 January 1917 to 117,681 including 481 nurses.³ Meanwhile, a new division, the 6th Division, began forming in England in February 1917.

One new unit of note was the I Anzac Corps School, which was formed in France on 11 November 1916. The school ran courses on subjects such as bombing, Lewis guns, trench mortars and signalling. All corps and armies of the BEF had their own schools but the Australian school was more influential than most because the corps always consisted of the same divisions, allowing for a great deal of continuity and conformity of procedures, and because the corps commander, Lieutenant General Sir W. R. Birdwood, was also GOC AIF, and so was responsible for training and doctrine throughout the AIF.

Important tactical and organisational developments occurred in over the winter. One major tactical and organisational change was in the organisation of the infantry. As we have already seen, the original allocation of Lewis guns of four per battalion was gradually increased to twelve at the end of July 1916.⁴ This organisation, while fairly successful from a tactical point of view, had some administrative drawbacks because the Lewis guns in the battalion section were administered differently to the others, and the LGO could not devote sufficient time to training Lewis gunners and providing technical

¹ Letter, Brigadier General H.E. Elliott to Captain C.E.W. Bean 15 May 1929 describes one such truce, 1DRL264/1B:

"When we took over, the 58th Battalion was told by the Guards Division whom they relieved that they had come to a tacit understanding with the enemy not to fire on each other since if they did neither side could get food up. The next day after the relief General Birdwood met a slightly wounded man of the 58th and asked him if he had met any Germans. His reply was he saw dozens of them but was not allowed to shoot at them. Birdwood came to my HQ in a furious rage and asked me how I dared to issue such an order. Of course, I denied doing so and made inquiries which elicited the truth and no more was heard of the complaint. But in consequence of General Birdwood's action the truce was declared off and every Hun seen was fired on. This naturally brought retaliation and we had the worst of the deal owing to the long carry."

² I Anzac Corps General Staff Circular No. 31, 13 November 1916. AWM26 114/25

³ *Australian Imperial Force. Statistics of Casualties, etc.*, Records Section, AIF HQ, London, 1919, p. 22

⁴ BGGS I Anzac Corps, GS Circular No. 14, 31 July 1916 AWM26 50/14; GS 2nd Division, 19 July 1916, AWM26 56/2

advice when he had his own section to look after. In December, enough Lewis guns became available to give each infantry battalion sixteen guns and BEF GHQ decided to allocate one to each platoon while still allowing for them to be pooled at company level if need be.

The platoon was now confirmed as the primary tactical unit. Bombing and scouting platoons were broken up so that each platoon now had a Lewis gun section, a bombing section, a rifle grenade section and a scouting section. The platoon now contained all the weapons available to the infantry except the light trench mortar, and so could operate independently. It therefore became the primary tactical unit instead of the company. The infantry battalion not only contained more firepower than ever before, it could be dispersed over a greater area, because control was delegated to its platoon leaders.⁵

A Lewis gun section consisted of nine fully trained Lewis gunners, although there was only one Lewis gun. The section leader was a sergeant or corporal. He allotted fields of fire, arranged reliefs, and recorded ammunition expenditure and breakages. Any damage that put the gun out of action had to be reported to the platoon commander. Each squad had a gunner, the man who carried the gun into action and fired it. The gunner carried a satchel over his shoulder with a wallet containing the smaller spare parts inside. The diggers improvised a sling for the Lewis gun from two rifle slings, which enabled the gun to be fired on the move from the hip.

An assistant stuck close to the gunner, ready to replace the gunner if he was hit and helping the gunner in any way possible with loading and breakages. The assistant carried four Lewis gun magazines, each of which contained 47 rounds. The spare parts of the Lewis were so numerous that they were divided between the gunner and the assistant. The assistant carried the spare barrel, cylinder, and piston rod with cleaning rods for both barrel and cylinder and both gunner and assistant carried oil. They were both equipped with revolvers as a secondary weapon. In action, the assistant lay beside the gunner because he was more likely to attract attention if he was continually running over to the gun. From this position, he could also provide the gunner with moral support and take over more quickly if the gunner became a casualty.

The rest of the team were riflemen doubling as ammunition carriers, scouts and observers. Each rifleman carried 50 rounds of rifle ammunition. One rifleman carried four to eight Lewis gun magazines and maintained close touch with the gunner and assistant, ready to replace the assistant if either the assistant or the gunner became a

⁵ BGGS I Anzac Corps, GS Circular No. 38, "Organisation, Training and Fighting of Infantry Battalions", AWM26 114/27

casualty. Two were lightly loaded scouts, moving ahead of the gun, locating targets and observing for the gun when necessary while the second scout could be used as a messenger when the gun was in position. The remaining three were ammunition carriers with six magazines each. The practice was for each man to have an even number of magazines since an evenly distributed load is easier to carry. The handcarts originally issued to transport the Lewis gun and its ammunition were found to be unsuitable and were replaced in January 1917 by one General Service cart per company.⁶

Lewis gun magazines could not be carried in the standard rifle ammunition pouches, while the tin cases holding eight magazines in canvas carriers in which Lewis gun magazines were delivered to the front line were good for preventing damage in transit but too awkward to carry into action. Various units developed or acquired different pouches for carrying the magazines in action and no standard pattern was insisted upon. A Canadian invention, the Yukon pack, was widely used by carrying parties but was too conspicuous in battle, leading to the loss of the carrier and most likely the ammunition as well if it could not be recovered. The Lewis gun sections preferred smaller, more easily concealed pouches. All up the section carried 35 full Lewis gun magazines and 300 spare rounds each.⁷ If the Lewis gun magazines ran out, each of the riflemen could contribute 10 or 20 rounds to reload some of the Lewis gun magazines.⁸

In addition to the Lewis guns, the number of Vickers machine guns per division was increased 16 to 64 with the addition of a fourth machine gun company, one assigned directly to division rather than brigade. The fourth company had the same establishment as the three brigade machine gun companies, but was commanded by a major who was also designated the Divisional Machine Gun Officer (DMGO). To assist him in performing these duties, a captain was added to the establishment of the fourth company.⁹ Five new companies were formed in England in January 1917. The 21st and 22nd Machine gun Companies joined the 1st and 2nd Divisions respectively in March 1917 but the 23rd and 24th Machine Gun Companies were reassigned to newly formed brigade of the 6th Division and, with the 25th Machine Gun Company, did not move to France until September 1917. On arrival, each was inspected by its division commander, except for the 23rd, which was inspected by the BEF commander, Field Marshal Sir Douglas Haig himself.¹⁰ The drift of control of the machine guns to higher headquarters,

⁶ BGGS I Anzac Corps, General Staff Circular No. 41 "Transport for Lewis Guns" 1 January 1917, AWM26 114/28

⁷ "Lectures (By Military Officers) Machine Guns including Lewis Guns", AWM25 385/4

⁸ "Quick Thinks", AWM25 987/4

⁹ OB/407, Appendix VI. 68. to GHQ Summary of 17 June 1917, AWM26 185/3

¹⁰ War Diary, 21st Machine Gun Company, AWM4 Roll 450; War Diary, 22nd Machine Gun Company, AWM4 Roll 451; War Diary, 23rd Machine Gun Company, AWM4 Roll 452; War Diary, 24th Machine Gun Company, AWM4 Roll 453; War Diary, 25th Machine Gun Company, AWM4 Roll 454

which had already seen responsibility moved from battalion to brigade, now continued in favour of division. Already, however, a position of Corps Machine Gun Officer (CMGO) had been created and training and coordination functions relating to machine guns had moved to corps control.¹¹

The reasons behind the control of medium machine guns by higher echelons were tactical, as the weight required them to set up in advance and the new barrage tactics involved the massing of large numbers of machine guns so division and sometimes corps control was required. Increasingly, the division was becoming its infantry plus spare parts. Divisions at the front would be augmented by corps. But corps had few units to give, so it obtained resources like additional artillery, engineers and machine guns by stripping the divisions not in the line. With four divisions, two would normally be in the line and two in reserve.

Another organisational change was the reorganisation of the field artillery from four to six guns per battery to economise on brigade and battery commanders. Each division would now have two brigades of 18 guns and 6 howitzers. The number of field artillery brigades in the AIF was thereby reduced from 20 to 13 and field batteries from 80 to 52. The divisions were now allocated two field artillery brigades each, each with three 18 pounder batteries and one 4.5 inch howitzer battery. Three brigades, the 3rd, 6th and 12th, were designated "Army" brigades and placed under I Anzac Corps control. These units were supplied with their own mechanical transport, the 3rd, 6th and 12th Park Sections. The reorganisation was tricky because brigades were still in the line when it occurred.¹²

The major tactical change however concerned counterbattery fire. The idea of counterbattery fire had been in disfavour before the war because experiments had shown that it required a mountain of ammunition to destroy an enemy field gun. However, shortly before the war, a French memo appeared that held that this was unnecessary. Rather than seeking physical destruction of the enemy artillery, it was mooted that simply preventing the enemy artillery from firing, that is preventing acquisition and thereby taking it out of the battle, would be worthwhile. This was logical given that so much of the enemy's firepower came from artillery. It also turned out to be much easier

¹¹ OB/407, Appendix VI. 68. to GHQ Summary of 17 June 1917, AWM26 185/3

¹² The Reserve Artillery Brigade in England had already been reorganised in December 1916. The 18 pounder batteries were reorganised in January. Because the divisions were each a howitzer battery short, the reorganisation of howitzer batteries had to await the arrival of the new 116th, 117th, 118th, 119th and 120th Field Artillery (Howitzer) Batteries in March. These were then disbanded, and the last of the howitzer batteries reorganised by 2 April 1917. Special AIF Order, 20 January 1917, Australian Archives CRS B539 AIF264/1/259; BGGS I Anzac, GS Circular No. 62 "Reorganisation of howitzer batteries", 25 March 1917, AWM26 152/6; AIF Order 566

to do, since a direct hit was no longer required. The French term for this was taken directly into English: neutralisation.¹³ In artillery parlance, guns are suppressed if they stop firing; they are neutralised if they remain that way for more than a short period of time after the fire upon them lifts.¹⁴

At Gallipoli, when the Olive Grove guns opened up, the artillery had serious problems with all four parts of our tactical model. They could not locate the guns, communication between different posts was poor, the guns were out of range, making acquisition impossible, and shrapnel could not destroy them. These problems were only partially solved in 1916 and persisted into 1917, but by that stage solutions to them all were at hand.

The problem of acquisition was the simplest, involving the provision of more heavy guns, and the number of heavy guns in the BEF rose from 761 in July 1916 to 1,157 in early 1917. This represented a qualitative as well as quantitative increase, with new models replacing older guns,¹⁵ while procedures were put in place to allow inaccurate guns to be replaced.¹⁶ A third Australian siege battery, the 338th, began forming in England on 20 December 1916. Originally, it was intended to equip it with 6 inch guns but in July 1917 it was decided to increase the size of siege batteries from four to six howitzers, like the field batteries, and the 338th Siege Battery was broken up to provide the additional personnel required.¹⁷

When it came to destruction, the ability to destroy a target having hit it, biggest problem was ammunition quality, which still left something to be desired but was steadily improving. Efforts were made to sort ammunition by lots and to keep fuzes from the same manufacturer together,¹⁸ while lots found to be defective were recalled.¹⁹ Accuracy was also improving. Special screens enabled muzzle velocities to be calculated. The screens were placed a set distance apart, the gun set to an angle and a shell fired through the screens. From this the velocity could be calculated, since a higher velocity produced a higher trajectory. There was increased understanding of how wear and tear on the barrel affects flight. During the latter part of the Somme campaign the BEF's Meteorological Section, which had originally been established to provide weather information to the RFC, began circulating its data to the artillery, and in February 1917

¹³ Gudmundsson, Bruce I., *On Artillery*, Westport, Connecticut, Praeger, 1993, p. 24

¹⁴ DuPuy, *Understanding War*, pp. 251-252

¹⁵ Falls, *Military Operations in France and Belgium 1917*, Volume I, p. 11

¹⁶ GHQ QMG, 22 November 1917, AWM26 104/24

¹⁷ "The Australian Siege Brigade in the Great War", Australian War Memorial MSS 686, p. 4; AIF Order 410

¹⁸ QMG BEF, "Sorting of 18 pounder shrapnel", AWM26 180/1 part 1

¹⁹ QMG BEF, "Do not issue any of this 18 pounder ammunition", AWM26 183/1

instructions were circulated explaining how to adjust for changes in wind, temperature and barometric pressure.²⁰

The biggest problem was that of location, and an enormous amount of ingenuity went into solving it. The first thing required was some decent maps and the British Army formed field survey companies, one per Army, to provide them. In 1917 corps topographical sections were added as well. On 3 July 1915 a small Australian Army Survey Corps numbering 20 men had been raised for the task of surveying and mapping Australia for military purposes. In 1917 they were permitted to enlist in the AIF, and fifteen did so; three were detained in Egypt and served in Palestine while the others went on to the Western Front where seven were assigned to British survey units and five helped form the new I Anzac Corps Topographical Section, whose mission was to provide up-to-date, accurate and detailed maps for front line units.²¹ This unit eventually had one officer and 15 other ranks.²² The Topographical Section produced 2,267 copies of 24 different maps in April, 65 different maps and diagrams in September and 82 more in October. Birdwood commented that:

It was unanimously agreed that the Corps Topographical Section had proved its worth. On several occasions the General Staff of the Corps asked themselves how they had ever managed efficiently without one.²³

Three technologies were developed for locating enemy artillery. The first was flash spotting. When an Observation Post (OP) equipped with special optical instruments spotted the flash of an enemy gun firing, it sent a signal back to the headquarters of the Army Field Survey Company that would cause a lamp on a switchboard to light up and buzzers to go off at both the headquarters and other OPs. Headquarters would get a bearing from the posts and would attempt to obtain a fix on the flash. The main difficulty was getting everyone to fix on the same gun when many were firing. Once at least three OPs had bearings that indicated the same target, its location could be noted. Flash spotting could also be used on one's own artillery rounds. In this way, even blind off-the-map shoots could be verified as on target.²⁴ Naturally, the technic worked best at night but its usefulness began to decline in 1917 as the Germans introduced flashless propellants.

²⁰ Falls, Cyril, *Military Operations: France and Belgium, 1917, the German retreat to the Hindenburg Line and the Battles of Arras*, London, MacMillan, 1940, p. 14

²¹ McNicoll, *Making and Breaking*, pp. 54-55, 77-78

²² Field Returns, Topographical Section I Anzac Corps, February - December 1917, AWM25 861/2

²³ War Diary of I Anzac Corps Topographical Section, AWM26 229/12, AWM26 229/13

²⁴ Hemming, "Flash Spotting and the Work of the Observation Groups", *Artillery Survey in the First World War*, Elstree, Field Survey Association, 1971, pp. 22-30

The second location technology was sound ranging. This was a technologically innovative method by which the location of enemy guns could be determined from the sound of the gun firing. Getting this idea to work involved considerable ingenuity on the part of Lieutenant W. L. Bragg,²⁵ an Australian scientist serving in the British Army, and others.

In October 1915, Bragg was ordered to collect a sound ranging outfit in Paris and experiment with it at the front. Two French inventors there, Lucien Bull and Charles Nordmann, had constructed a device for recording the sound of guns firing on photographic film with an error of less than 0.01 seconds. The major drawback of the Bull recorder was the need to develop the film, which took about five minutes.

Bragg found that all sound ranging systems suffered from a serious technological difficulty. When an artillery piece is fired in your direction, you hear first a loud crack, then a faint rumble, and finally an explosion. The first is often mistaken for the sound of the gun report, but is in fact the shell wave, a sonic boom caused when it exceeds the speed of sound well into the trajectory of the shell. The low rumble is the true gun report. The final sound is the shell exploding. Timing it with a stopwatch produces too great an error so it was necessary to record and automatically time the reports, hence the development of the Bull mechanism. Unfortunately, normal microphones are sensitive to high frequency noises like people talking or dogs barking rather than the low frequency sound of a gun report. In particular, they were sensitive to the shell wave. A British Corporal, W. S. Tucker, invented a new kind of microphone which was not only sensitive to low frequency noises but gave a faithful transcript of the sounds which Bragg was able to integrate into the first working sound ranging system. Camouflage netting was used to protect the Tucker microphones from air turbulence and they were arranged in the shape of an arc of a circle to make it easier to match up the reports. The system was calibrated by setting off an explosion at a predetermined point. During the Somme campaign, about two thirds of batteries located were reported by sound ranging.²⁶

Sound ranging was sensitive to atmospheric effects, particularly wind, but under ideal conditions the location of a gun could be determined to the metre. Under normal conditions, 25 to 50 metres was more like it. Sound Ranging was not affected by fog, rain or darkness but could be impacted by wind, especially one blowing towards the

²⁵ Bragg was a brilliant young scientist who in 1915, at the age of 25, became the youngest ever Nobel Prize winner for his work on X-rays.

²⁶ Bragg, "Sound Ranging", *Artillery Survey in the First World War*, Elstree, Field Survey Association, 1971, pp. 31-40; General Staff (Intelligence) GHQ, "Notes on Sound Ranging", 28 November 1916, AWM26 104/9

enemy. Rapid changes of temperature, such as occur when the sun comes out on a foggy morning, also produced poor results. Thus results obtained from sound ranging were best checked against those obtained by other methods. Like flash spotting it could also be used for ranging one's own artillery. In the case of counter battery work, no adjustments were required for wind, air pressure or temperature as the friendly and hostile shells were fired under the same conditions. In this case it was found that the position of the friendly bursts relative to the hostile gun would be within 5 metres for line and 20 metres for range. Moreover, sound ranging could do one thing that other technologies could not: identify the calibre of the gun fired. The gun report alone gave a rough guide; the flight time also gave information. Since the position of the shell burst was known, it was also possible to examine the crater. Most sound ranging reports specified the calibre, number of guns, location of the guns and the target they were firing at.²⁷

The third location technology was aerial observation. Aerial photography was now routine and every corps flying squadron had its own photographic section. As photographs became more plentiful, the art of interpreting them became more sophisticated. In many ways, this was the most effective technology but aircraft were limited to daylight and good weather. Thus the three technologies were complimentary. Aircraft and sound ranging were increasingly used in combination, an aircraft noting the flash of an enemy gun but unable for some reason to give its position accurately, could radio the sound rangers to watch for it.²⁸

The technology of communication was also improving. Radios became more widely available, and a wireless section had been created under Corps control.²⁹ In June 1917 Army wireless signal companies were abolished and wireless sub-sections were incorporated into the divisional signal companies.³⁰ Ground antennae sets with a range of 1000 to 1500 metres were recommended for work forward of battalion. For communication between battalion and brigade, the new Loops sets were provided; these had limited range but were very portable.³¹ In the air, improvements in radio technology allowed one aircraft with radio per 1,000 metres without the signals clashing - twice what had been possible before the Somme battle and aerial tactics were altered to take

²⁷ Bragg, "Sound Ranging", *Artillery Survey in the First World War*, pp. 31-40; Hartcup, *The War of Invention*, pp. 68-73; General Staff (Intelligence), GHQ, "Notes on Sound Ranging" 28 November 1916, AWM26 104/9

²⁸ Jones, *The War in the Air*, Volume IV, , Oxford, Oxford University Press, 1934, pp. 151-152

²⁹ GS Circular , 23 September 1916, AWM26 184/8

³⁰ OB/242 17 June 1917, AWM26 185/3

³¹ BGGS I Anzac Corps, GS Circular No. 61 "Trench Wireless sets", 21 March 1917 AWM26 152/6

advantage of the strengths of radio.³² Radio technology was still immature and not as good as telephones but showed great promise.

Allocation of Radios to Signal Companies (1917)³³

	Army	Corps	Division
Wilson Sets	2	2	-
Trench Sets	3	1	3
Tuners, Receiving	5	3	-
Amplifiers, LF	4	6	4
Power Buzzers	6	6	6
Loop Sets	6	2	10
Ground Antennae Sets	-	-	12

Another new form of communication was the power buzzer. This device produced electrical impulses that could be picked up as a high pitched buzz by one of the low frequency amplifiers used to eavesdrop on the enemy's telephone conversations. This allowed messages to be sent in Morse code. Like the radio, it required no wires and was much smaller, although it also needed a supply of bulky rechargeable cells. It was therefore suitable for sending one-way messages from the assault troops back to brigade headquarters.³⁴

Artillery command arrangements were officially revised on 8 December 1916, with the army Major General, Royal Artillery (MGRA) granted executive control of the Army artillery with the title of General Officer Commanding Royal Artillery (GOCRA). Similarly, the corps BGRA became the corps GOCRA, with executive command of all artillery in the corps - siege, field and divisional. The corps GOCRA also gained the right to deal directly with the corps Royal Flying Corps (RFC) commander.³⁵ Birdwood, drawing on the experience at Gallipoli, proposed an even more radical idea, suggesting the placement of all heavy and siege artillery under army control. He felt that the corps sectors were too narrow and restricted the heavy guns to frontal fire whereas broader frontages would permit more effective enfilading fire. The proposal was not accepted.³⁶

³² Jones, *The War in the Air*, Volume III, , Oxford, Oxford University Press, 1931, pp. 310-311

³³ GHQ Director (Signals), "Communications by Wireless", AWM26 185/25

³⁴ BGGS I Anzac Corps, GS Circular No. 56, "Power Buzzer Working", 14 March 1917, AWM26 152/6; Rawling, *Surviving Trench Warfare*, pp. 126-127

³⁵ BGGS I Anzac Corps, "Command and Organisation of Artillery", 8 December 1916. AWM26 114/27

³⁶ GOC I Anzac Corps, "Heavy Artillery Organisation", 8 December 1916. AWM26 114/27

Although each division now had fewer guns assigned, the practice was for divisions in the line to be reinforced with army brigades and the artillery of resting divisions.

As technologies for location improved, an organisational structure grew up around counterbattery fire. The first step was the creation of the post of Artillery Intelligence Officer at I Anzac Corps Heavy Artillery Headquarters on 14 April 1916. This was an Intelligence Corps officer charged with the responsibility for obtaining information from observers, particularly aerial observers. Lieutenant J.R.C. Bodley was appointed to the post on 10 June 1916 but he was too junior to coordinate the counterbattery effort that was now the prime role of the artillery.³⁷

In December 1916, a Royal Garrison Artillery officer, Lieutenant Colonel C. S. Pritchard, was appointed Counterbattery Staff Officer (CBSO) at I Anzac Corps Heavy Artillery headquarters with the task of collecting counterbattery intelligence and forwarding weekly summaries to Army headquarters. Certain heavy groups were permanently assigned to counterbattery missions and the CBSO was empowered to order groups to fire on such targets as he might designate. Pritchard was in fact senior to the heavy artillery group commanders and commanded the Heavy Artillery in the absence of the BGHA.

The Artillery Intelligence Officer prepared maps showing the location of all known enemy batteries in the corps area and sent copies to the CBSO and CBSOs of adjacent corps, the corps GOCRA, BGGS and BGHA, the division BGRAs, the commanders of all heavy artillery groups detailed for counterbattery missions, the commander of the corps flying squadron, and that of the Army field survey company, which included both flash spotters and sound rangers.³⁸

The first test of the new organisation would be a completely unexpected one. On 22 February 1917 the German forces opposite I Anzac Corps did something completely unexpected: they began a series of fighting withdrawals to a shorter, prepared position which the Allies called the Hindenburg Line. It proved impossible to prevent the enemy from slipping away just as the Allies had done at Gallipoli. Indeed, delayed response to patrol reports gave them a good 48 hours head start and contact was therefore lost. After two years of unremitting trench warfare the BEF was slow to respond to the rapidly changing requirements of open warfare.

³⁷ MGGS British Second Army, 10 June 1916, AWM25 75/29

³⁸ Counterbattery Orders CB73 and CB84, AWM26 117/10; MGGS British Fifth Army, "Artillery Intelligence", 21 March 1917, AWM25 75/29

Advance Guards (March 1917)³⁹

Formation	Left Column	Right Column
Commander	Brigadier General J. Gellibrand	Brigadier General H. E. Elliott
Artillery	12th Field Artillery Battery	54th Field Artillery Battery
Aviation	British 4th Flying Squadron	British 3rd Flying Squadron
Engineers	Two sections, 6th Field Company	Half company, 14th Field Company
Infantry	6th Infantry Brigade	59th and 60th Infantry Battalions
Light horse	Troop of B Squadron, 13th Light Horse Regiment	C Squadron, 13th Light Horse Regiment
Machine Guns	6th Machine Gun Company (less two sections)	15th Machine Gun Company (less two sections)
Medical	One bearer subdivision of 5th Field Ambulance	One tent subdivision of 15th Field Ambulance One bearer subdivision of 15th Field Ambulance
Supply		Half a brigade section of Small Arms Ammunition Section of 5th Division Ammunition Column

To pursue the retreating Germans, General Sir H. de la P. Gough, commander of the British Fifth Army, of which I Anzac Corps was a part, employed something much discussed and practiced before the war but not yet used: brigade groups, all arms formations of brigade size.⁴⁰ They were not advance guards in the sense described by the *Field Service Regulations*,⁴¹ for the main body was not advancing behind them but was held back, partly in case of a counterattack, but mainly because of the difficulties

³⁹ BM 6th Infantry Brigade, "2nd Australian Division Advance Guard Order No. 1", 17 March 1917, AWM26 167/2; GOC 15th Infantry Brigade, "Advanced Guards Operation Order No. 1", 17 March 1917, AWM26 177/2

⁴⁰ "Notes of Corps Commanders' Conference", 26 February 1917, AWM26 180/1

⁴¹ *Field Service Regulations*, pp. 78-81

maintaining larger forces further forward.⁴² Gough's use of columns to pursue the enemy were in contrast to the more cautious tactics of General Sir H. S. Rawlinson, commander of the neighbouring British Fourth Army, who used only cavalry to keep contact.⁴³

In addition to the ground elements, each column had a flying squadron detailed to fly air cover for it. Normally the entire corps had but one squadron, so this represented both a huge increase and an innovative experiment in the use of aviation technology.⁴⁴ Unfortunately, they were hampered by the poor weather, which was both cold and wet.⁴⁵

Bad weather and the state of the battlefield area, which was a devastated quagmire, slowed the pursuit. In the area beyond, towns had been burned, railways torn up, bridges systematically demolished and roads blocked by fallen trees or rubble. Supplying water for men and animals was always tricky in the Somme region, but was made more difficult by pipes being damaged, wells fouled by human excreta and horse manure, and ponds being rendered unfit for drinking by dumping chemicals like Westphalite explosive in them. These problems were tackled with the usual ingenuity by the water supply units.⁴⁶

There was insufficient labour and materials to repair the roads and railways. On 26 February 1917 I Anzac Corps engineers opened the Albert-Pozieres-Le Sars main road to traffic but estimated that it would require 2,500 tonnes of road metal per mile to keep it open, whereas only 300 tonnes were on hand.⁴⁷ I Anzac Light Railways, a new unit formed on 28 December 1916 to operate and maintain the tramways, an increasingly important form of transport in the forward area, set to work extending the network. Owing to the muddy ground, especially where it had been extensively shelled, the normal 7.2 and 9.5 kg rails were found to be inadequate unless heavily ballasted, which required more time, materials and manpower than was available, so heavy section 14 to 34 kg rails were scrounged or salvaged and laid on full sized sleepers.⁴⁸ By May I Anzac Light Railways was hauling 558 tonnes daily.⁴⁹ The corresponding strain on horses was great because with the roads out of commission, only animal transport could keep up with the columns. To keep its guns firing, the 54th Field Artillery Battery used a mule

⁴² Letter, Major General C.B.B. White to Major Generals J.J.T. Hobbs and N.M. Smythe, 18 March 1917, AWM26 152/6

⁴³ Minutes of Army Commanders' Conference, 24 March 1917, AWM51 52, p. 110

⁴⁴ GS Circular 65, "Corps RFC Organisation", AWM26 152/6

⁴⁵ "Notes on points of Interest in Recent Operations", AWM26 152/8

⁴⁶ Extracts from War Diary, I Anzac Corps Water Supply Officer, AWM26 182/3 part 2

⁴⁷ Report, Chief Engineer I Anzac Corps to HQ I Anzac Corps 26 February 1917, AWM26 156/18

⁴⁸ Letter, Lieutenant General Birdwood to HQ *British Fifth Army* 2 March 1917, AWM26 152/5

⁴⁹ "Anzac Light Railways Report" 16 May 1917, AWM26 182/1 part 1

train of 140 mules.⁵⁰ Not only was the BEF short of horses but many horses had been diverted to other purposes over the winter and their sudden withdrawal back to their nominal duties caused some disruption.⁵¹ At the same time, the GHQ was considering ways to economise on horses, because remounts and fodder were taking up scarce shipping space.⁵² Field Marshal Haig was unwilling to reduce the number of cavalry divisions but economies of 26,300 horses were effected across the BEF.⁵³

As a means of forcing the pursuit to move more slowly and cautiously, the Germans made widespread use of booby traps. These could be activated mechanically, electrically or by using a timer. Considerable ingenuity went into these devices. A shovel stuck in the side of a dugout between the timbers, a stove with the stove pipe nearby, cap badges or other tempting souvenirs, a nail sticking out of a board, a book on a table or a lump of coal, all could be deadly booby traps. In addition, hand grenades were left in trenches in a condition where they could explode at any moment, and roads were mined.⁵⁴ The worst incident was the explosion of a delayed action mine in the Bapaume Town Hall on 25 March 1917, killing 24 Australians.⁵⁵

The two Australian columns both advanced faster than the British forces on their flanks, compelling Brigadier General H.E. Elliott's column to occupy some positions in a neighbouring sector. Elliott's column was spearheaded by the 13th Light Horse Regiment, which proved that mounted troops were still both mobile and survivable, able to pass through small arms and artillery fire which might have stopped infantry. However Elliott felt that their usefulness was limited by their lack of automatic weapons.⁵⁶ A vanguard of infantry then followed, accompanied by engineers and machine gunners.⁵⁷ The infantry generally moved in artillery or "diamond" formation with the platoons of each company disposed in a diamond pattern, and the sections of each platoon disposed the same way.⁵⁸ The new infantry organisation proved ideal for the conditions of semi open warfare, as it had more firepower and flexibility than the 1914 platoon. Fire and movement was used when confronted by the enemy, with one unit providing cover while another advanced.

⁵⁰ Major J. D. Lavarack, "Notes on the work of field artillery during the recent advance of I Anzac Corps", AWM26 182/2

⁵¹ "Notes on Recent Operations of Fourth Army" by General H. S. Rawlinson, 3DRL2316/24

⁵² OB 1859 *British Second Army* 9 May 1917, AWM26 183/1 part 2

⁵³ Minuted Field Marshal Haig to War Office, 6 June 1917, AWM26 185/3

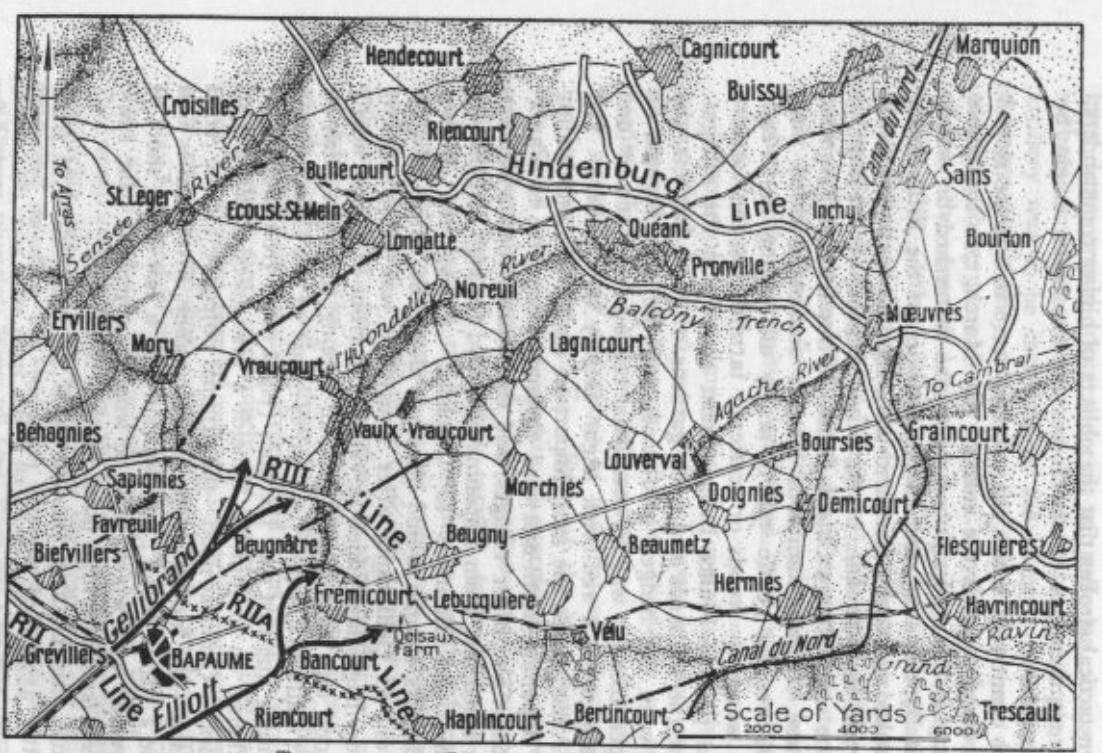
⁵⁴ "German Ruses", GHQ Summary of 8 April 1917, AWM25 45/144/3

⁵⁵ Bean, C.E.W., *The Official History of Australia in the War of 1914-1918, Volume IV: The AIF In France 1917*, Sydney, Angus and Robertson, 1929, pp. 205-206

⁵⁶ "Notes on points of Interest in Recent Operations", undated, AWM26 152/8

⁵⁷ GOC 15th Infantry Brigade, "Advanced Guards Operation Order No. 1", 17 March 1917, AWM26 177/2

⁵⁸ Bean, IV: *The AIF in France: 1917*, pp. 163-165



THE AREA FROM BAPAUME TO THE HINDENBURG LINE.
This shows the boundaries and sphere of operations of the two advanced guards of the I Anzac Corps when following the German withdrawal in March 1917.

Firing Lewis guns from the hip became standard procedure. In the 15th Infantry Brigade, slings were attached to the radiator with copper wire, enabling the Lewis to be fired even when it became red hot, the gunner holding the sling with his left hand. Towns were cleared by Lewis guns firing down the streets while bombers cleared the houses on both sides. A general criticism of the infantry was that they had become too used to using the bomb and bayonet and were not using their rifles to maximum effect.⁵⁹ This of course was a hangover from trench warfare, where all infantry fighting was done at close ranges with bombs and bayonet. Many infantrymen had simply forgotten the capabilities of the rifle.

Another departure from trench warfare was in signalling. In the trenches, posts had been connected up by telephone. This could not be laid quickly enough to keep up with the advance, nor could wire that had been laid be retrieved fast enough. Signal wire soon ran short. Units were enjoined to exercise economy in its use and expenditure on lines of no tactical importance was prohibited.⁶⁰ Units were encouraged to make greater use of radios as an alternative means of communication.⁶¹ All arms, but particularly the

⁵⁹ "Notes on points of Interest in Recent Operations" undated, AWM26 152/8

⁶⁰ Minute from BGGS I Anzac 21 May 1917, AWM26 181/1 part 1

⁶¹ General Staff Circular No. 61 "Trench Wireless Sets" 21 March 1917, AWM26 181/1 part 1

artillery, rediscovered visual signalling.⁶² The use of smoke was now easier as the workshops had modified P bombs to be fired as rifle grenades.⁶³

This was no pursuit of a demoralised and defeated enemy, but a deliberate, planned, fighting withdrawal. A typical rear guard consisted of three detachments of 112 hand picked men, three platoons of 40 storm troopers, six mounted patrols of six men each, 12 machine guns and 6 field guns.⁶⁴ Such a force had the firepower to hold up one of the columns. The rear guards used the textbook tactic of holding strong points with intervals between them. Australian tactics were to avoid the strong points, outflanking or enveloping them where possible and in most cases the Germans withdrew rather than allow themselves to be surrounded.⁶⁵ The capture of the towns of Fricourt and Beumetz by double envelopment was a personal vindication for Elliott, whose advocacy of such tactics before the war had been deprecated by the same Major C.B.B. White who was now the Corps chief of staff.⁶⁶ In his handling of his column, Elliott favoured advancing as fast as possible to keep the enemy off balance. He was still at tactical odds with White, who favoured a systematic approach with columns halting on preset lines and the cavalry patrolling forward.⁶⁷ White seemed not to grasp how frustrating, absurd and costly this would have seemed to the men in the front line.

The enemy was quite capable of launching surprise counterattacks. Lewis guns, bombs and bayonets defeated two such counterattacks on the town of Beumetz, held by Elliott's column, on 23 and 24 March 1917 with disproportionate losses inflicted on the enemy.⁶⁸ Counterattacks against the 15th Infantry Brigade were often defeated before they developed by the air/artillery team, using wireless and a zone call system. This involved the aircraft communicating a location or "zone" from a pre-arranged signal and the artillery opening fire on it. The fall of shot would then be adjusted as required.⁶⁹

The Germans completed their withdrawal to the Hindenburg Line by the end of March but held the villages in front of it as an outpost line. These were systematically attacked. Normally the town was cut off by single or double envelopment followed closely by an assault on the village itself, thus pinning the defenders in place. When the envelopment

⁶² "Notes on Recent Operations of Fourth Army" by General H. S. Rawlinson, 3DRL2316/24

⁶³ MGGS British Fifth Army 26 February 1917, AWM26 180/1

⁶⁴ "Notes on Captured Orders of 1st Guards Reserve Division", Annexe to GHQ Summary of 15 March 1917, AWM25 45/144/2

⁶⁵ Letter, Brigadier General H.E. Elliott to Captain C.E.W. Bean, 29 August 1927, AWM26 3DRL606/260/1

⁶⁶ Note, Major C.B.B. White to Lieutenant Colonel H.E. Elliott, 1912, AWM38 3DRL606/260/1

⁶⁷ Letter, Major General C.B.B. White to Major Generals J.J.T. Hobbs and N.M. Smythe, 18 March 1917, AWM26 152/6

⁶⁸ "Operations - 5th Division" 26 March 1917, AWM26 152/6

⁶⁹ "Notes on points of Interest in Recent Operations" undated, AWM26 152/8

went ahead swiftly, most of the garrison was captured. None of the attacks used extensive artillery support and some were successful without any, a development made possible by the increased firepower of the infantry. However, all required excellent staff work, initiative, resolution and timing on the part of the infantry. Notably, one of these attacks, the double envelopment of the town of Hermies by the 2nd and 3rd Infantry Battalions, was the first major attack in the history of the AIF to go exactly according to plan.⁷⁰

In support of the upcoming British and Canadian attack at Arras scheduled for 8 April 1917, Gough wished to launch an attack on the Hindenburg Line itself. It was an extraordinarily strong position. Trenches were sited on reverse slopes where they could not be observed from the ground and there was extensive barbed wire, two to four belts strictly parallel, about 5 metres apart, the width of each belt varying from 10 to 15 metres. Some were sunken, some in a serrated pattern, constructed so as to be covered by machine guns firing in perfect enfilade. There were no anti-tank gun positions.⁷¹

Cutting barbed wire had long been a serious tactical problem and a number of technics had been tried, the most simple being cutting it by hand with wire cutters. This was effective, but costly if it had to be done under fire. Another technic was to use artillery fire. It was discovered that neither shrapnel nor high explosive shells were very efficient at cutting wire. In 1915, the French produced a new kind of fuze they called the *Fusée Instantée Allongée* (elongated instantaneous fuze), which contained a brass tape that unwound during flight. Once unwound, it freed the hammer. When the shell hit the ground, this struck the mercury fulminate detonator, which set off the primer and exploded the shell. British inventors made some changes to improve its safety, reliability and suitability for mass production resulting in Type 106 percussion fuze.⁷² The result was a shell that exploded on impact with all but the softest ground. The explosion produced no crater, but deadly steel splinters were sprayed over the ground at high speed and could kill a man 800 metres away and hence the infantry called them "ground shrapnel" or "daisy cutters". This new fuze promised to be very efficient against wire. The first Australians to see them demonstrated were the Siege Brigade on 20 September 1916.⁷³ The British Fifth Army, of which I Anzac Corps was a part, was

⁷⁰ Bean, IV: *The AIF in France: 1917*, pp. 250-251

⁷¹ "Notes on the Hindenburg Line in the Neighbourhood of Bullecourt", AWM26 152/7

⁷² Hartcup, *The War of Invention*, pp. 57-59

⁷³ "The Australian Siege Brigade in the Great War", AWM224 MSS686, p. 4; Bean, IV: *The AIF in France: 1917*, p. 99

allocated 5,100 Type 106 fuzes on 9 February 1917,⁷⁴ and some were used by I Anzac Corps in a minor attack on 1 March, fired by a British siege battery.⁷⁵

There had not yet been time to cut the Hindenburg Line's wire. Only with the capture of Noreuil, the last of the outpost villages opposite Bullecourt, on 2 April could the field artillery be brought within range. Even then, ammunition supply still posed a problem. The broad gauge railway network only reached Bapaume on 6 April and the road system was not yet able to handle fully laden trucks.⁷⁶

Accordingly, the task fell on the I Anzac Corps Heavy Artillery. The 60 pounders and 6 inch howitzers had proven themselves sufficiently mobile to keep up with the advance, which Gough considered to be the outstanding tactical lesson of the campaign.⁷⁷ On 2 April, they were ordered to begin the bombardment of the Hindenburg Line.⁷⁸ But sufficient ammunition to cut the wire had not yet been brought up owing to the higher priority given to road making material.⁷⁹ Using a mix of 6 inch, 8 inch and 9.2 inch howitzers,⁸⁰ two bombardment groups fired some 12,346 shells between 5 and 8 April while two counterbattery groups fired another 11,235 shells.⁸¹ Only a small proportion had 106 fuzes, of which only 12,000 - all I Anzac Corps had - had been expended by 15 April.⁸² When they ran out, wire cutting was carried out by the 4.5 inch howitzers of the field artillery using HE.⁸³

Gough's response to the problems of artillery, ammunition and wire was a technological and tactical innovation. From the beginning, 12 tanks had been earmarked to support the attack.⁸⁴ Tank officers put forward a proposal to have the tanks advance in front of the infantry instead of behind, tearing up the barbed wire and suppressing the enemy machine guns while the artillery concentrated on neutralising their German counterparts.⁸⁵ While tanks had been in use on the Western Front since September 1916, Australian soldiers knew them only as wrecks on the old Somme battlefield.

⁷⁴ Minutes of Army Commanders' Conference, 24 March 1917, AWM51 52, p. 62

⁷⁵ Falls, Cyril, *Military Operations: France and Belgium, 1917, the German retreat to the Hindenburg Line and the Battles of Arras*, London, MacMillan, 1940, p. 103

⁷⁶ Bean, IV: *The AIF in France: 1917*, pp. 259-267

⁷⁷ MGGS Fifth Army to I Anzac Corps 23 March 1917, AWM26 180/2

⁷⁸ BGGS to BGHA S1874, 2 April 1917, AWM26 152/7

⁷⁹ Bean, IV: *The AIF in France: 1917*, p. 261

⁸⁰ "Wire Cutting on Anzac Front", 2 April 1917, AWM26 152/6

⁸¹ I Anzac Heavy Artillery War Diary, AWM26 152/6

⁸² "Wire Cutting on Anzac Front", 2 April 1917, AWM26 152/6

⁸³ Bean, IV: *The AIF in France: 1917*, pp. 259-267

⁸⁴ BGGS I Anzac Corps, "Preliminary Instructions for Next Operations", 2 April 1917, AWM26 152/7

⁸⁵ Bean, IV: *The AIF in France: 1917*, pp. 272-274

The night of 10 April 1917 found the men of the 4th Division waiting out in the snow for the tanks to arrive. Just after daybreak, word came that the tanks had not arrived and the stunt was off and the diggers got up and walked back across the open, shielded from German observation by a snowstorm.⁸⁶ Gough ordered the operation to be repeated the next night. This time, the infantry were to attack even if the tanks failed to arrive. The I Anzac Corps staff showed little appreciation of the capabilities of the new technology. The timing of the operation was off because they failed to realise that the tanks could not advance at fast as the infantry, and the instructions from Gough regarding the drowning out of their approach noise by machine guns had not been implemented.⁸⁷

The result was a frontal attack on the Hindenburg Line without the benefit of a barrage and with precious little armoured support, which in any case followed the infantry. Captain Albert Jacka, who had won the Victoria Cross at Gallipoli, submitted a scathing report in which he labelled tanks "worse than useless", roundly criticising the crews' lack of punctuality, reliability, professionalism, organisation, leadership, efficiency and courage. In conclusion, he stated that:

In my opinion, manned by the bravest crews and placed directly under the infantry officers concerned, tanks would be of great help but they should *never* be relied on as the sole means of support.⁸⁸

To stop them, the Germans used artillery, trench mortars and machine guns firing steel tipped armour-piercing bullets.⁸⁹

Two enemy aircraft which were neither engaged by antiaircraft guns nor intercepted by friendly aircraft observed the field batteries firing in the Noreuil Valley, where they were packed close together with little cover, and brought down heavy counterbattery fire from guns of all calibres for 48 hours.⁹⁰ The German batteries firing were not located and the counterbattery fire was largely ineffective.⁹¹ Reports of the Forward Observation Officers (FOOs) were inaccurate all day. They frequently could not tell Australian soldiers from the enemy and caused problems with the protective barrage when it was needed most.⁹²

⁸⁶ Rule, *Jacka's Mob*, pp. 165-166

⁸⁷ Bean, IV: *The AIF in France: 1917*, pp. 278, 290-291, 349-350

⁸⁸ "Official Report on Cooperation of Tanks in the Fight of 10/11 April 1917", AWM26 182/5 part 2. Emphasis original.

⁸⁹ Bean, IV: *The AIF in France: 1917*, pp. 345, 347

⁹⁰ "Special Report on Enemy Aeroplanes", 12 April 1917, AWM26 165/2

⁹¹ Bean, IV: *The AIF in France: 1917*, p. 350

⁹² Brigadier General C. Rosenthal, "Report on Operations of 11 April 1917", AWM26 170/11

The amazing thing was that the infantry of both attacking brigades were able to capture parts of the Hindenburg Line. In this they were aided by the poor visibility, the fact that enough of the wire had indeed been cut to allow some units to get through, albeit with heavy casualties, the new platoon organisation, which gave the infantry the firepower to fight back, and superb leadership. This was not enough to hold the position, however, and the two brigades were bombed out. The Australians had brought 16 Vickers machine guns forward but they were useless against bombing attacks and 14 were lost.⁹³

In withdrawing to the Hindenburg Line, the Germans not only reduced the length of their front line, they also held it more thinly, thus building up a large reserve. Haig responded by thinning out his lines as well and as a result, the 1st Division found itself occupying 12,000 metres of front. It was distributed in depth according to British doctrine, except that in some cases the line was held so thinly that sentry posts were strung out between the piquets rather than in front of them, making the support line the true piquets.⁹⁴

⁹³ DMGO 2nd Division to CMGO I Anzac Corps, 27 April 1917, AWM26 184/1

⁹⁴ First Division G1905 13 April 1917, AWM26 157/4

Defence in Depth (March 1917)⁹⁵

Line	Where (relative to Front Line)	Strength
Sentry Posts		Section (4-7 men)
Front Line (Piquets)	Outposts in front of the villages of Noreuil, Lagnicourt, Boursies, Demicourt and Hermies	Platoon (15-20 men with a Lewis gun)
Supports	400 to 1,000 metres back	Remaining platoons of forward companies
Reserve	1,000 metres back	Remaining companies of forward battalions
Second Line	2.5 to 3.5 kilometres back	Remaining battalions of forward brigades
Corps Main Line	5 to 8 kilometres back	Remaining brigades of forward divisions
Corps Reserve Line	9 to 11 kilometres back	Forward units of Corps Reserve division

In typical British fashion, orders were to hold the forward line "at all costs" although the value of doing so was slight. The Defence Scheme also called for special attention to be paid to barbed wire entanglements,⁹⁶ but the diggers felt that barbed wire gave away the location of their camouflaged positions and would only erect it if under strict orders to do so.⁹⁷

⁹⁵ Bean, IV: *The AIF in France: 1917*, pp. 356-358

⁹⁶ HQ I Anzac Corps, "Defence Schemes", 24 November 1916, AWM26 114/26

⁹⁷ Brigadier General C. Rosenthal, "Notes Re German Attack April 15th", 19 April 1917, AWM26 170/12

Ammunition Expended by I Anzac Corps Artillery

1 April 1917 to 13 May 1917⁹⁸

Left Sector			
1st, 2nd and 4th Divisional Artilleries and 12th (Army) Field Artillery Brigade			
Shell	Rounds	Weight per shell (lbs)	Total Weight (tonnes)
18 pounder	326,313	18	2,674
4.5 inch howitzer	79,274	35	1,264
TOTAL	405,587		3,938
Right Sector			
5th Divisional Artillery and 3rd (Army) Field Artillery Brigade (approximate figures only)			
Shell	Rounds	Weight per shell (lbs)	Total Weight (tonnes)
18 pounder	100,000	18	820
4.5 inch howitzer	25,000	35	398
TOTAL	125,000		1,218
Heavy Artillery			
Shell	Rounds	Weight per shell (lbs)	Total Weight (tonnes)
60 pounder	80,002	60	2,186
6 inch gun	4,921	100	224
6 inch howitzer	88,277	100	4,020
8 inch howitzer	34,232	200	3,117
9.2 inch howitzer	27,709	290	3,204
12 inch howitzer	285	750	97
15 inch howitzer	129	1,400	82
TOTAL	235,555		12,930
GRAND TOTAL	750,000		18,106

On 15 April 1917 the Germans launched a counter attack against the 1st and 2nd Divisions near Lagnicourt. The piquets fought back hard with rifles, grenades and Lewis guns and a surprisingly large number actually drove off the enemy. Others held out until

⁹⁸ Brigadier General C. Rosenthal, "War Lessons", 19 April 1917, AWM26 170/12

they ran out of ammunition, then fell back if they were able or surrendered if surrounded. In most places the line was driven back to the supports where the Germans encountered the Vickers machine guns. Only at one point did they break though, recapturing Lagnicourt, behind which were the guns of the 2nd Field Artillery Brigade. To defend itself, each battery had only 10 rifles although the establishment provided for 36, but rifles were still in short supply and some had been left behind in the wagon lines.⁹⁹ This being completely inadequate the brigade commander, Lieutenant Colonel G.I. Stevenson, ordered his men to remove their gun sights and breech blocks and abandon the guns.¹⁰⁰ Other batteries continued firing, but prepared to pull out.

Meanwhile, I Anzac Corps Heavy Artillery had opened up. By mid-morning reserve battalions were successfully counterattacking and the artillery ceased fire at 1000.¹⁰¹ All told, the field artillery fired 21,135 shrapnel and 13,264 high explosive shells, and the heavies fired 8,243 - a total of 43,263 shells.¹⁰² Although 21 guns and howitzers had been in German hands for two hours, only 4 18-pounders and a 4.5 inch howitzer had been destroyed.¹⁰³

Defeating this attack cost I Anzac Corps 1,010 men, of whom over 300 were prisoners. The Germans lost 2,313 of whom 362 were captured.¹⁰⁴ The efficacy of the Defence Scheme was affirmed although it was about to be superseded. There was some soul searching about the loss of guns, which could have been much worse. However, the fact was that in order to be tactically useful, the field artillery had to be deployed forward, often in the zone of another division and there were only so many areas where the guns could be located. The provision of adequate guards for the guns was not an efficient use of infantry and so, in the end, the matter was dropped.

Inevitably, another attack on the Hindenburg Line at Bullecourt was ordered. A new technic was used to clear paths through the wire; twenty Bangalore torpedoes - long steel tubes filled with ammonal - were exploded.¹⁰⁵ The heavy artillery was increased to 31 batteries. Counterbattery groups hammered the German gun positions while the rest of the artillery pounded the Hindenburg Line and cut the wire. This was not accomplished without loss. The Germans knew where the artillery was now and vigorously shelled the area. They now had percussion fuzes too and used them and gas

⁹⁹ Brigadier General C. Rosenthal, "Notes Re German Attack April 15th", 19 April 1917, AWM26 170/12

¹⁰⁰ "Proceedings of a Court of Enquiry held in the field on 16 April 1917", AWM26 157/5

¹⁰¹ Brigadier General C. Rosenthal, "Notes Re German Attack April 15th", 19 April 1917, AWM26 170/12

¹⁰² Bean, IV: *The AIF in France: 1917*, p. 403

¹⁰³ Brigadier General C. Rosenthal, "War Lessons", 19 April 1917, AWM26 170/12

¹⁰⁴ Bean, IV: *The AIF in France: 1917*, pp. 356-358

¹⁰⁵ I Anzac Corps GS, "Summary of Operations for week ended Friday 27 April 1917", AWM26 153/1

shells to devastating effect.¹⁰⁶ Over the period from 1 April to 13 May the field artillery lost 5 18-pounders and 6 4.5 inch howitzers to enemy shellfire. Personnel losses were also severe: 112 killed, 319 wounded and 20 missing, which represented 25% of the artillerymen engaged.¹⁰⁷

This time, the infantry were provided with a creeping barrage advancing at a rate of 90 yards in three minutes. To keep German infantry and machine guns behind the Hindenburg Line at bay, searching fire was laid down. A barrage moved back and forth up to 300 yards from the standing barrage. This was found to be not far enough and Rosenthal recommended that in future operations the searching fire should range out to 800 yards. FOOs were provided with power buzzers that proved very successful, but they needed more training in their use.¹⁰⁸ Maps of the barrage were produced and 300 copies were lithographed by the I Anzac Corps Topographical Section. A machine gun barrage was incorporated into the plan. The Corps Machine Gun Officer, Lieutenant Colonel L.F.S. Hore, added the 5th Division's 8th and 14th Machine Gun Companies to the 2nd Division's four organic companies bring the total number of Vickers machine guns in support to 96. Steps were taken to make sure that the attackers had plenty of ammunition and bombs. To avoid the enemy barrage, the infantry waves bunched up at the jumping off point so that the enemy SOS barrage would fall behind them. This ploy was entirely successful. The infantry rehearsed the attack over an area similar to the target by day and night, the one on 30 April being supervised by Gough and Birdwood. As at Gallipoli, Birdwood hoped to attack at night but British units involved in other attacks that day wanted daylight. Haig set the starting time at 0345, 15 minutes after moonset and 40 before sunrise.¹⁰⁹

However good the plan looked on paper, it still had serious flaws, ones that should have been picked up. Despite all efforts, some of the wire was still not cut and the enfilading machine guns were not suppressed, or even targeted, which spelt disaster for troops attacking on the right, nor was the line of approach chosen with due consideration of the ground.

Nonetheless, the 6th Infantry Brigade managed to capture part of the Hindenburg Line and hang on. In the fighting, the tendency of the diggers to use the bomb and bayonet in preference to the bullet was again noted. The rifle grenade was also extensively used,

¹⁰⁶ Bean, IV: *The AIF in France: 1917*, pp. 359-360, 414

¹⁰⁷ Brigadier General C. Rosenthal, "War Lessons", 19 April 1917, AWM26 170/12

¹⁰⁸ Brigadier General C. Rosenthal, "Lessons Learnt in the Recent Fighting", 7 May 1917, AWM26 181/1 part 4

¹⁰⁹ Bean, IV: *The AIF in France: 1917*, pp. 422-426

some units expending twice as many rifle grenades as ordinary hand grenades.¹¹⁰ Over the next weeks, the Hindenburg Line around Bullecourt would be the scene of brutal fighting as the British and Australian armies clawed a chunk out of the Hindenburg Line. The 1st Division and then the 5th was committed to hold the gains against furious German counterattacks. The effort cost 7,481 casualties.¹¹¹ Afterwards, I Anzac Corps was withdrawn from the line for a well-deserved rest.

Meanwhile, the major effort of the year was about to begin. It is to this that we now turn.

¹¹⁰ "Lessons from fighting of 1st and 2nd Division at Bullecourt", AWM26 182/3

¹¹¹ Bean, IV: *The AIF in France: 1917*, pp. 543-544