

the character of the German offensive became clear, and losses reached staggering levels, Joffre urgently demanded as early a start as possible to the allied offensive. In May he and Haig agreed to mount an assault on 1 July 'athwart the Somme.'

Long before the starting date of the offensive had been fixed the British had been preparing for it by building up, behind their lines, the communications and logistical support the 'big push' demanded. Masses of materiel were accumulated close to the trenches, including nearly three million rounds of artillery ammunition. War on this scale was a major industrial undertaking.* Military aviation, of necessity, made a proportionate leap as well. The RFC had to expand to meet the demands of the new mass armies, and during the first six months of 1916 Trenchard, with Haig's strong support, strove to create an air weapon that could meet the challenge of the offensive. Beginning in January the RFC had been reorganized into brigades, one to each army, a process completed on 1 April when IV Brigade was formed to support the Fourth Army. Each brigade consisted of a headquarters, an aircraft park, a balloon wing, an army wing of two to four squadrons, and a corps wing of three to five squadrons (one squadron for each corps). At RFC Headquarters there was an additional wing to provide reconnaissance for GHQ, and, as time went on, to carry out additional fighting and bombing duties.³

Artillery observation was now the chief function of the RFC, with subsidiary efforts concentrated on close reconnaissance and photography. By early March the corps squadrons carrying out these tasks could no longer be spared for other roles; henceforth they remained specialized units tied to a particular sector of front. No 10 Squadron of I Brigade, for instance, flew in support of XI Corps, First Army. Between March and July the majority of its sorties were concerned with artillery co-operation, more than half of them for target registration. The workhorse of the corps squadrons was the BE2, though two of the fourteen squadrons still used the Morane Parasol. In the army squadrons the FE2b was replacing the Vickers FB5; it was used for fighting, reconnaissance, and bombing, and remained operational throughout the course of the war. The army squadrons also flew Martinsyde Scouts and DH2s.⁴ The establishment for all these squadrons was eighteen aircraft, but in early 1916 none had more than twelve. An increase to establishment took place slowly over the next months, with priority being given to those squadrons allocated to the coming offensive.

The RFC learned much from the rapid development of French aviation during the Verdun campaign. At the opening of the battle Germany had a decided advantage in the air. Although France had an equivalent number of aircraft at the front, she had fewer first-class aircraft (Nieuports and a few Spad-Bechereaus) than did Germany, whose best were the E-type Fokker and C-type Albatros. At Verdun itself the French had only one fighter and three reconnaissance squadrons when the Germans attacked.⁵

Prior to the offensive German air reconnaissance had provided the High Command with an accurate and detailed picture of the unchanging French dispositions around Verdun. During the first few days German aviation carried out

* At Loos in 1915 the ammunition supply had been 35,000 rounds for the heavy artillery, and about 500,000 for the field batteries. *Military Operations: France and Belgium, 1915*, II, 163n, 174-7

highly successful artillery co-operation and bombing operations. French aerial reconnaissance had been, by comparison, dangerously lax and German preparations had gone undetected until shortly before the attack was launched. The situation was rectified by deliberately weakening other sectors of the front. The French concentrated six fighter squadrons, mostly Nieuports, eight reconnaissance squadrons, and two heavy artillery aviation sections at Verdun. On 29 February orders were issued that gave official recognition to the use of formation tactics as opposed to the often individualistic methods that had marked earlier fighter operations. Offensive air patrols were to be carried out *in formation* by groups of at least three or four aircraft in order to seek out and destroy the enemy.⁶

These tactics were the key to French aerial success at Verdun, but there were other factors. The German response to French formation patrols was to bring up their Fokkers closer to the front and to group them into three fighter commands. Initially they achieved some success, but they ultimately proved incapable of dealing with the larger French formations. The results were extremely important for the ground battle; the supremacy of the French fighters permitted their artillery aircraft to function effectively, while their German counterparts were harried from the air. The German solution was to carry out 'barrage' patrols; that is, their aircraft constantly flew up and down their own lines, hoping to deny that air space to the French and thus free their artillery and infantry from the consequences of French aerial observation. In fact, the tactic merely dissipated German strength without preventing French penetration in force.⁷

Trenchard learned of these developments partly as a result of the friendship he had formed in 1915 with *Commandant* du Peuty, who had then been the Air Commander in the French Tenth Army. When du Peuty moved to the Verdun sector he and Trenchard exchanged liaison officers, and thus du Peuty's April report of air operations was made immediately available to Trenchard. Du Peuty drew three lessons from French achievements: first, the necessity for overall direction of fighter forces working in offensive formations; second, the primary importance of intelligence gathered by reconnaissance and photographic work, which 'in this particular battle far exceed in importance, urgency and results, all artillery work'; third, the need for adaptable air units able to perform a variety of tasks.⁸ Captain R.A. Cooper, Trenchard's liaison officer with du Peuty, supported those conclusions. 'Above all,' Cooper wrote: 'It appears that in a big offensive it is of the utmost importance to have great numerical superiority in fighting machines. It is thought that the Germans have readily learned this lesson at Verdun, and that if there is an offensive in the North they will oppose an even greater force in fighting machines than that which they have already concentrated at Verdun and that probably all their energy will be concentrated on fighting machines such as the Fokker single-seater.'⁹ Numerical superiority, according to du Peuty, should be used to mount continuous fighter patrols, in formation, over the enemy lines, thus creating a zone where no hostile aircraft could venture unescorted. As he pointed out, the method was a costly one since 'our machines fight in the enemy country,' resulting in losses of pilots and aircraft forced to land behind enemy lines. Moreover, the constant offensive was 'a wearing out method for pilots and observers.' Yet he concluded: 'However heavy our losses may have been, those of the

Germans have been heavier.' He also warned that there was no such thing as total air superiority. The weaker side could always gain momentary dominance by concentrating strength at a given point, single machines could always find opportunities to carry out bombing and reconnaissance missions, and low-level operations might often evade the surveillance of the offensive fighter formations. When forwarding du Peuty's report to Brancker at the War Office, Trenchard found it necessary to make only one qualification, with respect to the low priority assigned to artillery co-operation. 'For an offensive battle,' Trenchard noted, 'he considers that the relative importance of the various nature of the work would be different, artillery work being of primary importance, especially during the preliminary stages of the battle.' In making this observation he was clearly thinking of the task confronting the RFC for the Somme offensive. For the rest, du Peuty's findings anticipated to a remarkable degree the offensive tactics Trenchard was to pursue relentlessly for the remainder of the war.¹⁰

Early in the year air operations over British sections of the front were, by comparison with Verdun, desultory. Between January and the end of April brigade records show a total of 148 combats in the air. Only twenty-six aircraft were lost as a result of enemy action; aircraft accidents claimed eighty. Nine Canadians took part in these combats, and five of them became casualties. Lieutenant C.V.G. Field and Lieutenant E.S. Wilkinson, pilot and observer, respectively, were killed while carrying out a reconnaissance mission for 1 Squadron when their Morane was shot down. Both had been engineering students at McGill University when the war broke out. On 29 March Second Lieutenant F.G. Pinder of Victoria was wounded and became a prisoner of war. Max Immelmann's twelfth victim, Pinder was flying an FE2b with 23 Squadron, which had arrived in France only two weeks before. On 16 April Second Lieutenant W.S. Erle, also of Victoria, was engaged in artillery co-operation work with 9 Squadron when he was shot down in flames over enemy lines by Rudolph Berthold. On 26 April Second Lieutenant James Mitchell of Montreal, an observer with 18 Squadron, was killed during a fight with four enemy aircraft near Arras. Most combats in this period were between enemy scouts and reconnaissance and artillery aircraft. Combats between opposing fighters were infrequent and, it appears, rarely deliberately sought in the early months of the year.¹¹

Nevertheless, even before the lessons of Verdun had been received, the RFC was beginning to change its methods. In part this was made possible by the appearance of two aircraft which were better than anything the Germans could bring against them. Both the FE2b and the DH2 were pusher aircraft, thus sidestepping the British failure to produce an interrupter gear. The FE2b was a versatile two-seater in which both the pilot and the observer occupied cockpits forward of the wings. Though the aircraft, in its first version, had a maximum speed of only 73 mph, it was sturdy and manoeuvrable. The FE2b was also heavily armed; most squadrons mounted two Lewis guns in it, giving the crew an exceptionally wide arc of fire. No 20 Squadron first brought it to the front in January, when Lieutenants W.K. Campbell of Mitchell, Ont., and T. Jones of Toronto were the only Canadians with the unit. The DH2, a single-seater, was faster than the FE2b, having a top speed of 86 mph, and was esteemed for its excellence in aerobatics. It

was first flown at the front in early February by 24 Squadron, a unit which soon became one of the RFC's best fighter squadrons.

As early as mid-January Trenchard had encouraged his squadrons to develop formation tactics for air fighting. His views were reflected in a letter to the Prime Minister, signed by Haig, that the answer to the 'Fokker scourge' was not to refrain from flying. 'We must continue to reconnoitre,' he wrote. 'The remedy is not to stop sending machines out for this purpose but to send them out in groups rather than singly.' Trenchard's ideas took hold only slowly with his fighter squadrons, but well before the French example was available for imitation a number of squadrons were experimenting with formation tactics. On 30 April 25 Squadron's Captain William Milne of Chamadaska, BC, led a 'finger-four' formation of four FE2bs, including one flown by Second Lieutenant Charles Elias Rogers of Toronto, with a Bristol Scout trailing behind and somewhat above them. The formation flew deep behind enemy lines, in order to be up-sun and to cut off escape to the east. No decisive results were obtained on this occasion, but 25 Squadron, and other RFC fighter units which were pursuing similar approaches, were shortly to reap the benefit. French experience, then, served to confirm the line the RFC was already taking. By mid-June RFC fighter aircraft had established a clear superiority over German aviation on the Somme front, thanks to their new tactics, to their better aircraft, and to the fact that more than half the aircraft the RFC had concentrated on this front were fighters.¹²

The winning of air superiority through aggressive fighter operations was only a means to an end. The whole point of these operations was to permit freedom of action to artillery, reconnaissance, and other ground support aircraft and to deny such freedom to the enemy. Even if air superiority were achieved, it was worthless unless ground forces could use the product of the aerial work done on their behalf, and that depended both upon the quality of the product and the ability of army staffs to make use of it. Cases in point are the Canadian operations at St Eloi and Mount Sorrel in the Ypres Salient.

On 27 March the British 3rd Division, part of V Corps, in an endeavour to pinch out a small German salient at St Eloi, exploded several mines beneath 'The Mound,' a slight elevation overlooking ground that was otherwise flat and water-soaked. Desperate fighting for this scrap of deeply-cratered terrain took place over the next few days, until the British were so exhausted that relief was mandatory. On 4 April, therefore, the Canadian Corps relieved V Corps and 2nd Canadian Division found itself in possession of the morass created by the British operation.¹³

The next afternoon the Germans counter-attacked strongly and succeeded in retaking all the ground they had lost to the British. In the course of local Canadian counter-attacks the situation quickly became confused, partly because of contradictory reports from units and battalion scouts. One correct report, stating that the Germans had recaptured all the mine craters (numbered 2, 3, 4, and 5), was not believed at Brigade Headquarters, because it was understood that craters 4 and 5 had been recovered. In fact, however, Canadian troops had occupied two old craters, numbered 6 and 7. On 8 April an air photograph showed a newly-dug trench around craters 4 and 5, but the 'ineffectual ditches which had been attempted around 6 and 7 were overlooked. We congratulated ourselves on the

splendid work that we thought had been done by our crater garrisons.' Not until 16 April did the weather permit another air photograph to be made and the situation (which had evidently already been suspected at various levels of command) was conclusively revealed. Yet the evidence was already present in the air photographs of 8 April. The craters occupied then by the Canadians, and mistaken for 4 and 5, were half full of water; the real 4 and 5 craters, however, had no water in them.¹⁴

The St Eloi fiasco brought changes in the command of the Canadian Corps. 'General Plumer commanding 2nd Army wishes to remove General Turner ... and Brig. Gen. Ketchen,' wrote Haig in his diary. But Turner and Ketchen were Canadians and political considerations were uppermost in the decision to sacrifice instead the British corps commander, Lieutenant-General E.A. Alderson. Lieutenant-General Sir Julian Byng replaced Alderson on 29 May, just in time for the next large encounter with the enemy at Hooze and Mount Sorrel.¹⁵

The battle of Mount Sorrel was the first major engagement involving the entire Canadian Corps. In two well-rehearsed attacks on 2 and 6 June, each preceded by a storm of artillery fire, the Germans seized commanding ground around Mount Sorrel, Observatory Ridge, Hill 61, and Hill 62, as well as the spur at the ruined village of Hooze. The air assistance received by the Canadians prior to and during this first phase of the battle was not great. Five squadrons had a part in the engagement: 6 Squadron served the Canadian Corps, and had done so since early in the year; 5 Squadron supported v British Corps on the Canadian left; 16 and 20 Squadrons, escorted by scouts from 29 Squadron, carried out reconnaissance duties in the corps area.* RFC reconnaissance in May had alerted Corps Headquarters to German offensive preparations and indeed had discovered, well behind the German lines on the Menin road, practice trenches which closely resembled the Canadian positions on Hill 62. Bad weather, however, had prevented systematic observation of enemy rear areas.¹⁶

Provision already existed, under emergency conditions at army level, for the issuance of the call 'General Artillery Action,' at which time all routine air operations were to cease and all squadron aircraft concentrate upon artillery co-operation and tactical reconnaissance. On 21 May, as a result of a meeting between squadron commanders and artillery officers of the Second Army, these orders were changed to permit each corps to issue the emergency call to their own corps squadron and to summon help from neighbouring corps if required. At 1025 hrs on 2 June, after the terrible violence of the enemy's preliminary bombardment had first shaken the Canadians, 6 Squadron's record book shows the entry 'General Action.' But only one aircraft went up. Lieutenant R.A. Logan, a Canadian with 16 Squadron, flew over the battlefield on an early morning patrol; he seems to have had no particular instructions, but simply hoped to find an

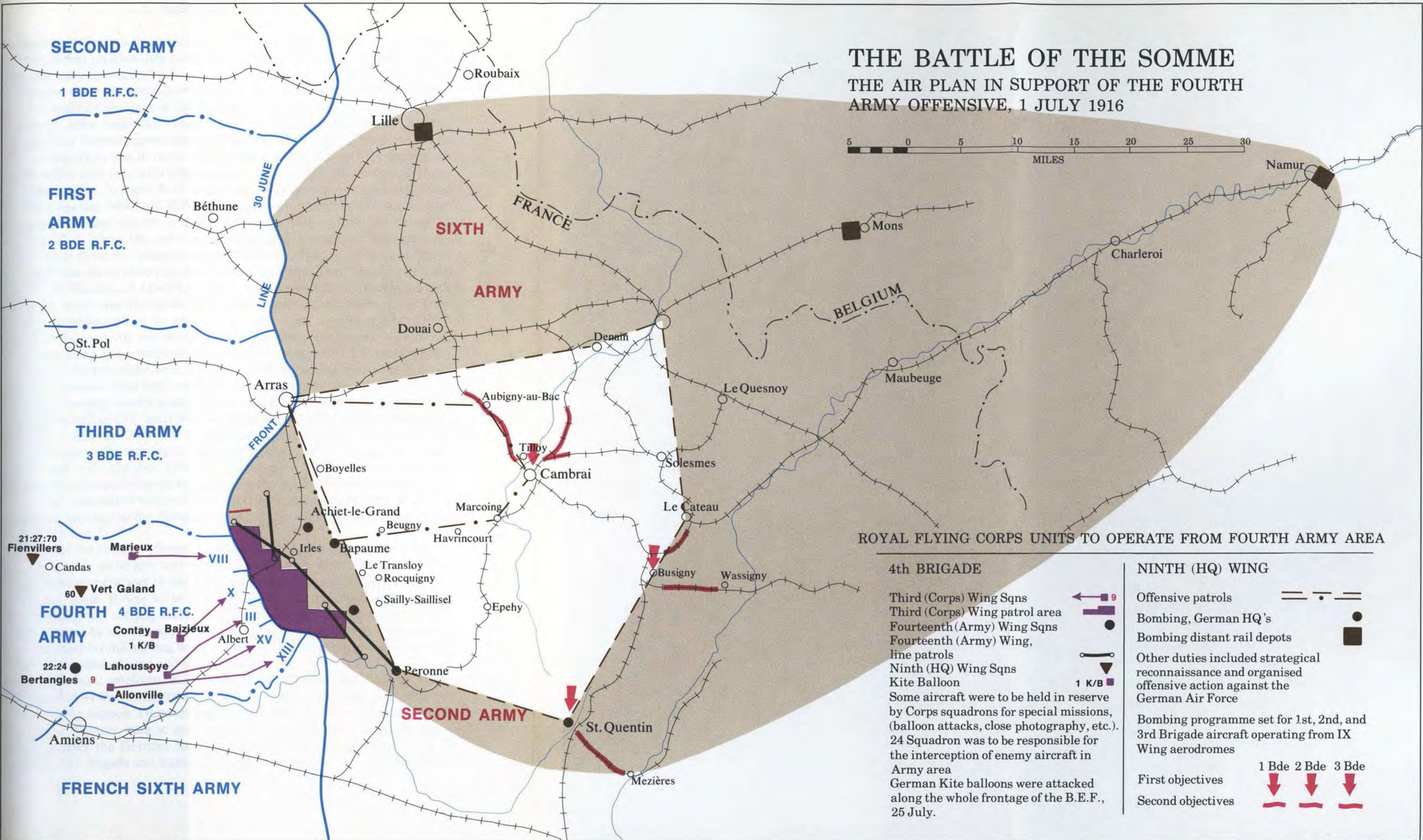
* Canadians flying with these squadrons at the time of the Mount Sorrel battle included J.S. Beatty of Toronto and J.S. Scott of Roberval, Que., with 5 Squadron; D.L. Macauley of Montreal, R.H. Martin of Viking, Alta, A.L. Wilson of Vegreville, Alta, and J.A. York of Vancouver with 6 Squadron; C.G. Davidson of Montreal, G.E. Hewson of Amherst, NS, R.A. Logan of Toronto, and G.A. Thompson of Vaudreuil Station, Que., with 16 Squadron; Kenneth Mathewson of Montreal, R.W. White and W.J.T. Wright, both of Toronto, with 20 Squadron; J.H.N. Drope of Grimsby, Ont., G.M. Murray of Toronto, and William Stobart of Winnipeg with 29 Squadron.

enemy scout in the area. The next day the squadron was much more active, six aircraft flying between 0300 and 0900 hrs to spot flashes from German batteries.¹⁷

Given the importance of the ground that had been lost, it was inevitable that General Plumer should seek to recover at least some of it. His battle plan drew upon the tactics employed by the Germans at St Eloi, making artillery the key. 'One of the greatest arrays of guns yet employed on so narrow a front' preceded the Canadian counter-attack on 13 June with a devastating bombardment. The success of this assault owed a good deal to the RFC. On 7 June excellent aerial photographs had revealed the new German trenches at Mount Sorrel and in Sanctuary Wood. Based upon these photographs, the Canadian artillery began a systematic bombardment of German positions. Between 9 and 12 June four false bombardments were carried out to deceive the Germans as to the timing of the forthcoming assault. On the 12th a massive ten-hour shelling preceded a final forty-five-minute barrage just before the infantry left their trenches. So effective was the target registration that the preliminary bombardment prior to the Canadian infantry attack virtually destroyed the German ability to resist. The Germans themselves cited allied artillery and air superiority as the prime causes of the Canadian success.¹⁸

This was the formula that the Allies hoped would bring victory in the Somme battle. In preparation they concentrated at least four hundred aircraft, and among the two hundred machines the RFC committed to the offensive were seventy-six of the new fighters. These forces were considerably in excess of German strength. At the Somme on 1 July the Germans had fifty-two reconnaissance aircraft, thirty-six bomber-fighters, and sixteen single-seater fighters, for a total of 104 machines. Not only were the Germans at a numerical disadvantage, but morale was low within the air arm. By comparison with the allied air forces, the German air force suffered from inadequate co-operation with ground formations and an overly rigid organization. Initially, their answer to the offensive air tactics of the Allies remained the wasteful method of barrage patrol which had already proved wanting at Verdun; moreover, during the early phase of the Somme campaign, the Germans chose not to reinforce their air units because the High Command was unwilling to abandon the offensive operations in progress at Verdun for the sake of stemming the allied relief operation on the Somme.¹⁹

In order to build up the level of strength Haig's plans demanded, Trenchard had to dilute his squadrons with many airmen who had little or no combat experience. He could only insist that pilots possess basic flying skills and trust that most of them would survive the stern test of actual combat. It was the same for observers. In the spring Trenchard had increased the establishment of observers in two-seater squadrons from seven to twelve, most of the new intake coming from army units already in France, including the CEF. A new observer got little formal training. Beyond what was imparted at the squadron, he might, if it were thought necessary, be sent for a short period to an artillery battery or to a front-line infantry unit to develop an appreciation of the needs of the ground forces with which he must work. All observers had to learn morse code and how to operate a wireless set and a camera. They had to acquire, as rapidly as possible, a detailed familiarity with



their squadron's 'beat' at the front; they had to master the handling of machine-guns. They picked up what they could by word of mouth, but there was no substitute for practical experience.²⁰

At the time when the preparatory phase of the Somme offensive began, there were about eighty Canadians at the front with the RFC, half of them with the headquarters, army, and corps wings slated for employment over the Somme battlefield. They formed approximately 10 per cent of RFC flying personnel at the front; this proportion was to remain fairly constant over the next six months, as Canadian inflow kept pace with RFC expansion. Most of the Canadians had transferred from the CEF. Trooper W.G. Barker followed a typical path. He had enlisted in the 1st Canadian Mounted Rifles in Winnipeg in December 1914 and after taking a machine-gun course in England he went with his unit to France in September 1915, when the CMR relinquished their horses and went into the trenches. From there he subsequently applied for transfer to the RFC. In March 1916 he was sent, as an observer under training, to 9 Squadron, then commanded by Major F.A. Wanklyn of Montreal. While on probation with this reconnaissance squadron he made nine patrols during March, was struck off the strength of the CEF and commissioned as an observer in early April, and then posted to 4 Squadron at Baizieux. (It was normal practice for observer-trainees to be posted elsewhere on being commissioned.) After 7 July he flew with 15 Squadron based at Marieux for the rest of the year. By the end of the Somme campaign he had won the Military Cross and had been recommended for pilot training.

This was how many other Canadians came into the RFC during the same period. Officers commanding CEF units were not eager to lose good men; nevertheless, neither the Canadian Corps in the field nor the authorities responsible for Canadian troops under training in England placed any official barrier upon such transfers until early October 1916, two weeks after the Canadian Corps had incurred its first severe losses on the Somme, at the Battle of Flers-Courcelette. At that time the Canadian Training Division in England was authorized to place a freeze on all transfers to the flying services until the reinforcement needs of the CEF had been met.²¹

The plan for the Somme offensive was simple. Along the entire front of Fourth British Army and, on its left, VIII Corps of Third British Army, a seven-day preliminary bombardment was to take place, intended to destroy German wire and machine-gun posts. It was to be so powerful that, in the confident words of General Rawlinson, 'nothing could exist at the conclusion of the bombardment in the area covered by it.' The job of the infantry, advancing in lines with soldiers three paces apart behind a lifting barrage, was simply to walk the mile or mile-and-a-half to the devastated zone and take possession of it.

The plan for RFC employment in support of the offensive was the most elaborate yet devised by the British, reflecting both the importance Haig attached to the air arm and the lessons Trenchard had learned from du Peuty. As at Verdun, formations of fighters were to escort reconnaissance aircraft and also to patrol aggressively over the German lines. The fighters were drawn from 22 and 24 Squadrons of IV Brigade and from 27, 60, and 70 Squadrons of 9 (Headquarters)

Wing.* Most of Trenchard's fighters at the Somme were FE2bs, DH2s, and Martinsydes, but there were also Morane Scouts and biplanes (now entering the last stages of their operational use) and a few Bristol Scouts and Sopwith 1½ Strutters. All the roles assigned to the fighters were important, but the most vital was to ensure that the corps squadrons were able to carry out artillery co-operation and other observation work with as little interference from hostile aircraft as possible. 'The provision of the means for this observation,' it was laid down in a GHQ paper, 'must be regarded as of primary importance ... so far as the Flying Corps is concerned efforts should be devoted to provide observation requirements in the first instance.'²²

For the five corps of Fourth Army and the one corps of Third Army taking part in the initial attack, 3, 4, 8, 9, and 15 Squadrons provided about eighty aircraft to carry out artillery work, contact patrols, and trench flights.[†] Since the British attack was to take place over a frontage of 25,000 yards, each corps squadron was responsible for a frontal zone of little more than three miles (the zones overlapped so that squadrons could assist one another). During the weeks preceding the attack, pilots and observers came to know their areas thoroughly. The usual attempts were made to standardize contact patrol procedures to ensure the rapid transmission of reliable information. Some infantrymen wore reflecting metal discs on their backs, others carried large fabric ground panels, and some were to set off flares upon reaching their objectives. On identifying and locating a unit, pilots were either to drop written messages or to land at specially prepared advanced landing grounds to pass on their information to the army command. Contact patrol aircraft were also expected to provide barrage information for corps headquarters and the artillery. Those airmen assigned to trench flights were to carry out close reconnaissance of enemy trenches and to bring down artillery fire upon them where required. In addition, the corps squadrons were to conduct a co-ordinated attack on kite balloons along the whole front.²³

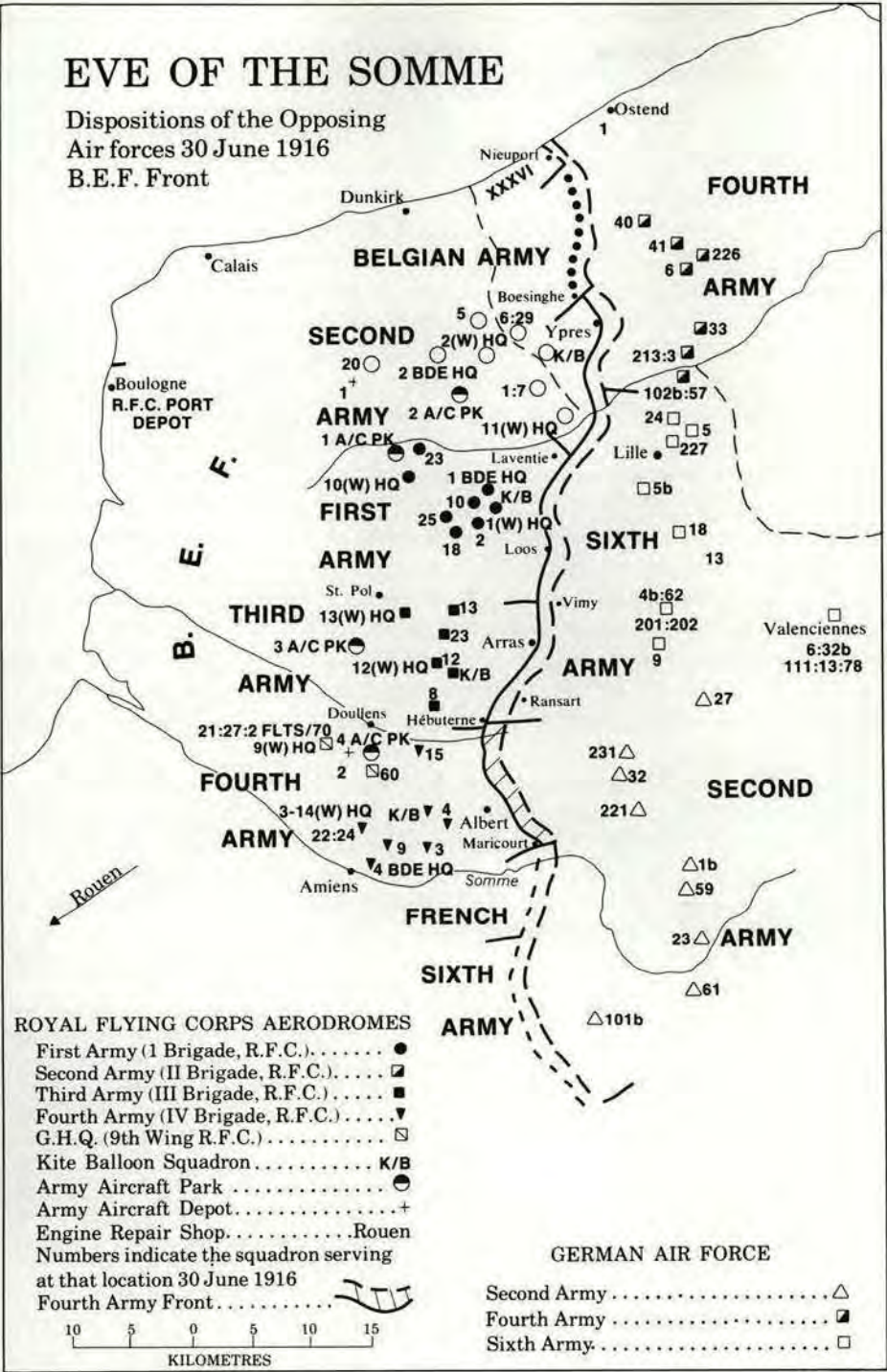
Another feature of the RFC plan for the opening phase of the Somme battle was a programme of bombing designed to strike at enemy communications and headquarters. Trenchard assigned the slow-moving RE7s of 9 Wing's 21 Squadron to

* When the Somme battle opened, Canadians with these fighter squadrons included C.M. Clement of Vancouver, A.B. Coupal of Sedley, Sask., W.R.C. Dacosta and J.H. Firstbrook, both of Toronto, W.L. Scandrett of London, Ont., A.M. Thomas of Toronto, W.O.T. Tudor-Hart and J.S. Williams, both of Vancouver, with 22 Squadron; Henry C. Evans of Macleod, Alta, A.G. Knight of Toronto, A.E. McKay of London, Ont., and H.A. Wood of Toronto, with 24 Squadron; A.D. Bell-Irving of Vancouver, J.A.N. Ormsby of Danville, Que., and J.H. Simpson of Saskatoon, Sask., with 60 Squadron; P.C. Garratt and J.A.G. Gilray, both of Toronto, with 70 Squadron. When the battle began there were no Canadians with 27 Squadron; on 25 July H. Spanner of Huntsville, Ont., became the first to join it.

† Canadian pilots and observers with these corps squadrons at the beginning of the battle included K.A. Creery of Vancouver and W.W. Lang of Toronto, with 3 Squadron; W.G. Barker of Winnipeg, T.L. Brennan of North Sydney, NS, R.S. Carroll of London, Ont., R.H. Jarvis and J.W. Langmuir of Toronto, J.H. Ross of Montreal and G.E.F. Sutton of Saskatoon, Sask., with 4 Squadron; R.W. Young of Toronto was the lone Canadian with 8 Squadron; C.P. Creighton of New Westminster, BC, I.C. Macdonell of Winnipeg and H.E. Paquin of Montreal were with 9 Squadron; F.G.H. Manville of Leask, Sask., and A.L. Taylor of Prince Albert, Sask., were with 15 Squadron.

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Dispositions of the Opposing
Air forces 30 June 1916
B.E.F. Front



the more distant targets. These bombers carried a single 336-lb fragmentation bomb.* For the tactical bombing of railways, railway cuttings, bridges, trains, and stations he drew upon BE2s from 2 and 10 Squadrons of I Brigade, 7 and 16 Squadrons of II Brigade, and 12 and 13 Squadrons of III Brigade.† The BE2s were to fly down each day to airfields in the IV Brigade area, leaving their home fields in early morning and returning to their bases at the end of the day's operations.²⁴

On 24 June the bombardment preceding the 'big push' began. The sheer weight of shells, combined with accurate registration of targets, was supposed not only to destroy the German wire, but to obliterate trenches and trench-support systems, fortified villages, and other strong points and artillery and machine-gun positions. The fire of the heavy batteries was directed by aeroplanes and balloons. On the first day of the bombardment low cloud restricted observation and the corps machines were unable to register many targets, but on the 25th improving weather and German retaliatory fire helped them to spot 102 hostile batteries. The next day destructive fire on registered targets began and air photographs taken in the afternoon appeared to show good results. Bad weather interfered with air work on the 27th and 28th, but on the 29th fifty-seven German batteries were spotted. The next day ninety-five targets were brought under fire through aerial observation. All seemed ready for the great attack: the bombardment had been heavy and thorough and excellent air photographs showed much damage to German positions. That the entrenched Germans could have endured this storm of fire without serious losses and lowered morale seemed unimaginable. Unfortunately for the attacking forces, however, much German wire remained uncut and the bulk of German troops had been sheltered from the effects of the bombardment in deep dugouts.²⁵

At 0630 hrs on 1 July, an hour before British troops were to go over the top, the bombardment reached its crescendo. Ground mist prevented air observation for a time, but aircraft were aloft. A British pilot of 9 Squadron described the scene: 'On the dawn patrol it was difficult to see what was happening on the ground. It was like looking at a bank of low cloud, but one could see ripples on the cloud from the terrific bombardment that was taking place below. It looked like a large lake of mist, with thousands of stones being thrown into it.'²⁶ At zero hour the whole

* Their crews had no high regard for the RE7, a cumbersome aircraft much given to engine failure. In his diary, J.B. Brophy of Ottawa recorded that when a new RE7 was demolished shortly after being delivered to the squadron. 'A cheer went up from all down the sheds ... The good will in which the RE7 is held by the Boys was plainly shown by the vicious kicks and heavy rocks directed against what was left of it. Everyone hates them ...' Diary, 11 June 1916, J.B. Brophy biographical file, DHist

† Canadians with the bombing squadrons at this time included H.H. Whitehead of Winnipeg, with 2 Squadron; D. Carruthers of Kingston, Ont., W.H. Hubbard of Toronto, Eric McIver of Oakville, Ont., J.G. Robertson of Vermilion, Alta, and E.J. Watkins of Toronto, with 7 Squadron; W.J. Clifford of Mount Hamilton, Ont., T.G. Gordon of Merritt, BC, A.E. Godfrey of Vancouver, and J.B.R. Langley of Edmonton, with 10 Squadron; G.P. Alexander of Toronto, E.W. Farrow of Ottawa, and C.I. Van Nostrand of Toronto, with 12 Squadron; R.A. Delhaye of Brandon, Man., and P.R. Meredith of Toronto, with 13 Squadron; J.B. Brophy of Ottawa, C.J. Creery of Vancouver, E.S. Duggan and A.M. Goulding, both of Toronto, C.V. Hewson of Gore Bay, Ont., L.M. McCoy of Quebec City, and L.P. Watkins of Toronto, all of 21 Squadron.

spectacle was visible to the airmen as the British troops rose and in endless lines moved against the waiting Germans. Nothing of this incredible panorama, nor of the terrible casualties suffered by many of the attacking units long before the German front lines were reached, entered the running reports from the air. On the right wing, where the Fourth Army won its chief success of the day, 9 Squadron co-operated with XIII Corps to useful effect. When unable to call down artillery fire, some of the aircraft attacked enemy targets with bombs and machine-guns. Not a single enemy aircraft interfered with their work because of the fighters above; only three German machines were sighted, at a distance and altitude that precluded engagement.

The contact patrol aircraft accurately reported the most advanced positions of attacking troops, while the squadron's trench flight aircraft provided additional details on their return to confirm the reports. One of the trench patrol aircraft, flown by Lieutenant Ian C. Macdonell of Winnipeg, dropped bombs on a quarry full of German infantry and then successfully ranged the 15th Siege Battery on to this target.* By 1700 hrs 9 Squadron aircraft reported Marlboro Wood, Caterpillar Wood, Bernafay Wood, and Trônes Alley all abandoned by the enemy. XIII Corps, at the cost of more than six thousand casualties, had captured its objectives and had been well supported by the RFC. Had the corps been prepared to take advantage of the reliable reports by 9 Squadron about limited German resistance on its front, a much more significant penetration might have been achieved. But the corps and divisional commanders adhered to their instructions and made no serious attempt to exploit beyond their immediate objectives.²⁷

Elsewhere on the front the corps squadrons coped as best they could with a battlefield on which all had gone awry. There had been tragic failure in nearly every sector and communications between attacking troops and higher formations had completely broken down. The aircraft serving XV Corps were unable to deliver an accurate picture of what was happening. The corps' objective was to capture Mametz and then to advance beyond that village to the German third line on its right; on its left it was to capture Fricourt and press on to Quadrangle Wood. By noon only some of the first objectives had been taken. However, aerial reports received just before noon described enemy guns being withdrawn to the rear of the German lines and identified British infantry in the communication trenches between Fricourt and Contalmaison. The commander of XV Corps, Lieutenant-General H.S. Horne, apparently misled by these reports and encouraged by the good news from XIII Corps on his right, ordered an attack upon Fricourt at 1430 hrs.²⁸

Horne had also been deceived by over-optimistic reports about the progress of III Corps on his left. This formation, served by the same RFC contact aircraft as XV Corps, was supposed to take Contalmaison and Pozières, fortified villages which lay behind an intricate network of defences. The night before a German listening-

* Macdonell, the son of Brigadier-General A.C. Macdonell, GOC 5th Canadian Infantry Brigade (and later Major-General commanding the 1st Canadian Division), was killed the following day. Another Canadian contribution of note in this sector was made by H.E. Paquin of Montreal, an observer in 9 Squadron who provided target information for the French artillery in support of XIII Corps' right flank.

post in the sector had overheard enough of General Rawlinson's final order that the defenders were thoroughly prepared; 'the extended lines of British infantry broke against the German defence like waves against a cliff, only to be beaten back.' Yet to the air observers, remote from 'the moans and groans of the wounded, the cries for help and the last screams of death,' it appeared that the first advance had taken the front line at 0845 hrs. Later reports qualified this by noting that the advance was held up at two points, Ovillers and La Boisselle, but on the right airmen saw infantry penetrating as far as Peake Wood, towards Contalmaison. However, the main body of troops had advanced only half that distance, many units having been shattered or disoriented under heavy enfilading machine-gun fire. Horne's attack on Fricourt therefore received no help from his left, and in any event the wire and deep dugouts at that strongpoint were virtually intact. Though RFC observers had managed to bring down effective counter-battery fire upon German artillery positions in XV and III Corps sectors, there was no way to neutralize the German machine-guns. Mainly because of them, XV Corps suffered over eight thousand casualties and III Corps over eleven thousand during the day.²⁹

The most dismaying failure took place on the northern half of the battlefield. Thiepval and the Thiepval spur dominated this point, but it was thought that the position could be turned if St Pierre-Divion and Grandcourt, both on the Ancre, could be captured. But German artillery, laying down supporting fire in front of both hamlets, remained active all day in spite of counter-battery work directed from the air, and the German garrisons held firm. Thus Lieutenant J.W. Langmuir of Toronto and his British observer, flying a BE2c of 4 Squadron, tried to range the 72nd Siege Battery upon a German battery. Although thirty shots were fired upon it Langmuir reported that 'The pits were not damaged, and the hostile battery was active throughout the shoot.' Moreover, the three corps squadrons had difficulties with mist and swirling smoke apparently not encountered farther south.

No 4 Squadron brought in the most crucial information, but unfortunately what its contact patrols were able to see – the advance by the 36th Division against the Schwaben Redoubt – was misleadingly encouraging. By 1400 hrs British troops were in possession of the redoubt and German batteries were reported to be withdrawing from the Grandcourt-Courcelette Ridge. But this was an isolated penetration and, unhappily, the RFC could supply little accurate information about the position on the rest of the corps front. Before noon air reports identified British troops in Thiepval, a report not corrected until late in the afternoon. Meanwhile, supports had been pushed forward, taking heavy casualties. Even with respect to the troops in Schwaben Redoubt air intelligence was not uniformly good. Information that German counter-attacks against this point were weak may conceivably have influenced the failure to reinforce the troops holding it. By 1000 hrs the British infantry had been forced to withdraw, their ranks sorely depleted and their supplies of water and ammunition exhausted. At the end of the day X Corps held only part of the German first line north of Thiepval and the Leipzig Salient to the south, at the cost of over nine thousand casualties.³⁰

North of the Ancre, VIII Corps fared even worse, suffering more than fourteen thousand casualties. At first, success seemed imminent. On the left, aircraft observed troops entering Pendant Copse, though smoke and dust made observation difficult. To obtain this intelligence, pilots had 'displayed amazing daring, flying along the front sometimes only fifty feet above the troops under heavy small-arm fire.' What they could not see was that the troops which had succeeded in penetrating the German lines were rapidly enveloped and overcome. As on X Corps' front, counter-battery work failed to silence German artillery, nor could anything be done to stop the murderous fire from German machine-gun positions.³¹

The full dimensions of the disaster that had overtaken the British Army on the first day of the Somme took some time to sink in. The RFC, however, was confident that it had done a good job, particularly in its vital task of keeping enemy aircraft away from the machines of the corps squadrons. 'The general impression of the day's work,' wrote the commanding officer of 9 Wing, 'has been that the Germans started with the intention of attacking any of our machines which might cross their lines. As the day wore on they were gradually driven from the sky, and after 1.0 pm scarcely a German machine was seen in the air, and those which were seen manifested no aggressive tendencies.' German sources tell the same tale. Only nine aeroplanes of IV Brigade reported combats in the air. RFC losses were light; fourteen casualties occurred over the entire front, four of them Canadians. Two FE2bs were lost over the Somme. In one of them Lieutenant J.H. Firstbrook of Toronto was flying over the enemy lines at five thousand feet when he was shot in the back by an enemy aircraft he failed to see. Though he had no recollection of doing so, he managed to land his aircraft behind enemy lines. Lieutenant W.O.T. Tudor-Hart of Vancouver was an observer on a similar mission; his pilot was killed but he survived the crash. Both Canadians became prisoners of war.³²

The RFC's performance in battlefield reconnaissance, despite the courage and daring of its airmen, had been weak. In part this was undoubtedly because of the large number of relatively inexperienced pilots and observers. At the same time, however, the demand placed upon the air arm was without precedent. No previous experience even remotely approached the scale and complexity of the Somme battle. It is hardly surprising that airmen were not always accurate in reporting the details of confusing battles in the vast warren of the German trench system. By the end of the Somme campaign the RFC's performance in this respect would be much better.

The RFC, and the British official air historian, believed that the bombing operations on 1 July were successful, the latter citing evidence to show that the bombs dropped on St Quentin station by 12 and 13 Squadrons disrupted the dispatch of reinforcements. On the other hand, the British Army's historian took the view

* Lieutenant C.I. Van Nostrand of Toronto (the first of the Toronto Curtiss School graduates to have been accepted by the RFC) was taken prisoner after his 12 Squadron RE7 was forced down behind enemy lines. The fourth Canadian casualty was 32 Squadron's G.C. Simpson of Guelph, Ont., who was killed when his DH2 was shot down after he launched a single-handed attack on ten German bombers near Festubert. H.A. Jones, *The War in the Air: being the Story of the Part played in the Great War by the Royal Air Force*, II (London 1928), 332

that 'air activity against material objects ... in no way affected the fate of the battle.' What is certain is that unescorted bombing missions needlessly lost aeroplanes, while army squadrons searched vainly over the lines for enemy fighters because of the assumption that such fighting patrols were the only effective method of preventing enemy air activity. When, two days later, more BE2cs were lost for the same reason, 13 Squadron's commander pointed out that 'Experience has shown that hostile machines avoid Allied machines flying in formation and attack isolated machines. This increases the likelihood of being attacked when the patrol is not at hand.' Trenchard's decision was to withdraw the BE2cs and return them to their parent brigades; 9 Wing assumed responsibility for bombing and distant reconnaissance in the Somme region.³³

Whatever criticisms have been made of RFC dispositions and performance on 1 July, two conclusions are evident. The first is that the RFC had seized and maintained air supremacy over the battlefield; the second is that even had RFC airmen been able to provide intelligence of the situation on the ground with flawless accuracy, it would have made virtually no difference to the outcome of an attack doomed to failure through faulty conception. However, had the quality of RFC work been better, or at least more consistent, there might well have been significantly fewer casualties.

In the pause that followed that terrible day's fighting some regrouping was carried out in the BEF. Lieutenant-General Hubert Gough took over X and VIII Corps on 2 July and the next day his command was designated the Reserve Army (ultimately to become the Fifth Army). The RFC conformed; 4 and 15 Squadrons were combined to form 15 Wing, the nucleus of the future V Brigade.* On 7 July Haig began to bring down reinforcements from quieter sections of the front, but bad weather was hampering air operations and he resolved not to resume the main attack until the weather permitted the RFC to bring its superiority once more to bear. Nevertheless, the RFC continued to accumulate information about enemy dispositions. The work of 4 Squadron was typical. During the week following 1 July two Canadians, Second Lieutenant J.H. Ross of Montreal and his observer, Lieutenant G.E.F. Sutton of Saskatoon, Sask., carried out several important special reconnaissances until Ross was wounded on 7 July. Both received the Military Cross for their work; Ross' citation read in part: 'On two occasions he carried out reconnaissances at a very low altitude to determine the general situation. His machine was repeatedly hit by rifle fire, and he was severely wounded in the arm. His reports were most valuable.'³⁴

Less spectacular but equally important were the artillery patrols carried out during this period by Second Lieutenant R.S. Carroll, a Curtiss School graduate born in London, Ont., and his British observer. Their reports, couched in the technical

* On 21 July 32 Squadron (DH2s) was transferred from I Brigade to the Somme front and on 27 August was grouped with 15 Wing to form V Brigade. When, on 5 September, 23 Squadron (FE2bs) came from III Brigade it joined 32 Squadron to form 22 (Army) Wing. When 32 Squadron came to the Somme there were only two Canadians with it: C.L. Bath of Toronto and G.H. Bonnell of Halifax. In mid-September the Canadians with 23 Squadron included V.C. Gordon, J.H. Kelly, and A.P. Maclean, all of Toronto; they were later joined by W.B. Kellogg of the same city and K.C. MacCallum of Vancouver.

language and studded with the abbreviations and coded map references now standard in corps squadron work, were packed with detail. Thus on 3 July, while on a three-hour patrol in the early evening, they discovered an enemy battery firing. They reported its location by message bag to the artillery. As a result 17th Siege Battery was 'turned on to the target,' the enemy battery was silenced, and seven ammunition wagons were blown up. Later in the patrol they noted a 'train with steam up at Achiet-Le-Grand'; then, when over Le Sars, were attacked by a hostile aircraft whose fire damaged their propeller, before it was chased off by a British fighter. They finished off their patrol by sighting a column of German motor transport of twenty vehicles, noting laconically, 'H.A.G. [Heavy Artillery Group] informed but no shots fired.' On the 6th, in the course of another three-hour patrol, they examined from 3000 feet the whole of the German second line opposite their corps front, recording the location of new trenches and saps, the information that at two points 'the second line trench and wire appear to have been slightly damaged ... but on the whole of the remainder of the line there is very little damage done,' and the location of eleven enemy batteries whose flashes they spotted. On three of them they brought down artillery fire until 'batteries temporarily silenced ... Shoot discontinued owing to want of petrol, when batteries recommenced firing.'³⁵

Work of this kind, routine in nature, was vital to the fortunes of the armies below. The airmen who carried it out were almost never in the limelight, but a study of corps squadron records during the Somme battle shows a steadily rising proficiency on the part of aircrews in the little-heralded corps squadrons that was as impressive as any of the other work performed by the RFC. Perched directly over the battlefield in their slow two-seaters, flying their unchanging beats, despite enemy fighters, ground fire, and the threat of being struck in the air by shells fired by the artillery of either side, they were developing a meticulous expertise in their hazardous and crucial task, a task largely unappreciated except by the gunners and intelligence officers who worked directly with them. And there were other hazards. On 9 July Carroll and his observer were on a shoot with 20th Siege Battery, from which six shots had been fired, 'when Morane aeroplane carried away aerial. Returned for new aerial but battery could not receive signals.' Grit, constant watchfulness, and, above all, patience were the hallmarks of good corps squadron airmen.³⁶

After 9 July, when the weather improved, heavy slogging by the infantry edged the allied front ahead. Contalmaison fell to III Corps on 10 July, Mametz Wood to XV Corps on the 12th. During these lesser operations the RFC kept up its air offensive and Trenchard reported with evident satisfaction that German machines were not getting across the lines. Though on several occasions aircraft from IV Brigade attacked columns of troops on the march with machine-gun fire, no German aircraft responded in kind, nor were allied troop movements even observed from the air, a great advantage in preparing for the second major push of 14 July. German infantry of this period are supposed to have scrawled on their dug-out walls the imprecation 'May God punish England, our artillery and our airmen.'³⁷ Yet when challenged by bombing raids behind the front, the German air force could respond fiercely. On 9 July 21 Squadron flew an early-morning raid

against Marcoing station. J.B. Brophy described in his diary the action over the target: 'We turned south just beside Cambrai, and found our mark, Marcoing station. I let my bomb go and had to turn off quickly to dodge a bomb from another youth who was above me. I saw his bomb go down. Several lit on the tracks in the station yards, and probably ruined them. As soon as our bombs were dropped we turned and lit out for home, devil [sic] take the hindmost. He did, as poor old Hewson was picked off by a bunch of huns, who attacked us from behind, and fired at us and went away. We haven't heard what happened to him, and hope he landed safely.'³⁸

On 14 July the British Army attacked once more on a two-corps front, this time without the collaboration of the French, whose staff refused to join in 'an attack organized for amateurs by amateurs.' In fact, the assault was a distinct improvement on the performance of 1 July. Large numbers of air photographs taken in the preceding days had outlined the second German trench system plainly. A creeping barrage, timed to the movement of the infantry, was employed and air co-operation with ground formations was highly successful. In spite of low clouds and a strong west wind, 3 and 9 Squadrons flew continually from dawn until dusk. The infantry, as the result of a devastating but brief preliminary bombardment, a jump-off at first light, and the well-timed creeping barrage, were able to take most of their objectives. Contact patrol aircraft, some of them equipped with a Klaxon horn to remind infantry to indicate their position, brought in accurate reports. Despite such work, the great chance of the day was missed. Infantry of XIII Corps had broken through all opposition by 1000 hrs and found the way clear to High Wood. Further infantry advance by reserves close at hand was forbidden by higher authority, however, since this part of the operation was to be entrusted to the cavalry. As late as 1500 hrs an air report showed that the approaches to High Wood were still clear of the enemy, but not until 1900 hrs did cavalry units begin their advance. When a German machine-gun post on their right opened up on them, it was silenced by fire from a low-flying aircraft. But when darkness made further operations impossible, the cavalry had reached only the wood's outskirts; two months of bitter fighting were to pass before High Wood was completely in British hands.³⁹

After 14 July the Somme campaign, begun, at least on Haig's part, with visions of a clear-cut breakthrough, was transformed into a battle of attrition. The British remained upon the offensive and in the end won their way across the gentle ridges which had so dominated their positions on 1 July. These limited gains were made at enormous cost, for not only did armament and terrain favour the defence but the Germans had been ordered to defend every inch of ground to the death. So unyieldingly did German troops adhere to this order that by the close of fighting their casualties, at least according to some estimates (themselves the subject of much controversy), equalled or even exceeded those of the Allies. Many of the engagements fought before the offensive concluded in November have been accorded distinctive names, such as the Battle of Flers-Courcelette in which the Canadian Corps figures prominently and tanks were used for the first time, but

* C.V. Hewson of Gore Bay, Ont., was reported killed in action as the result of this encounter.

they were all of a piece: desperate struggles for stretches of churned-up soil, unrecognizable villages, and segments of devastated trench line. From the sweeping advances it had first hoped for, the British staff was reduced to a preoccupation with the minor tactics of trench warfare, in which the gaining of a few hundred yards could be hailed as a victory. The Somme battle did achieve one of its desired results, however; ten days after it began Falkenhayn brought the offensive at Verdun to an end.⁴⁰

Until late in the Somme battles the RFC retained the upper hand. In part, this was because the Germans kept much of their air strength at Verdun until the end of August. It was also because of Trenchard's driving insistence upon the doctrine that 'Protection of artillery, photographic and similar machines is best secured by an active aerial offensive, carried out by offensive patrols and bombing raids.' This principle, towards which Trenchard had been moving for some time, was enunciated explicitly during the Somme campaign. It was to govern British flying operations on the Western Front for the rest of the war. As Trenchard later stated, offensive fighter patrols were to 'seek for, fight, destroy and drive down the enemy's machines'; bombing raids were to induce enemy commanders to demand air protection for communications, depots, and headquarters, 'which will result in the withdrawal of aeroplanes and anti-aircraft artillery from the battle area.'⁴¹

Since bombing raids were launched not solely to damage enemy targets but to draw off enemy air strength as well, Trenchard maintained direct responsibility for the bombing programme at RFC Headquarters. Tactical bombing was carried out by the corps squadrons in front of their respective armies. Since the corps squadrons of the Fourth and Reserve Armies were fully occupied in reconnaissance and artillery work, 8, 12, and 13 Squadrons of the Third Army's III Brigade carried out the major share of tactical bombing on the Somme front. Martinsydes of 9 (HQ) Wing's 27 Squadron and RE7s (later BE12s) of 21 Squadron were used on occasion against more distant targets in the zone of operations, including the railway facilities at Mons, Maubeuge, Quievrechain, Valenciennes, and Aulnoy, and also undertook the major responsibility for bombing targets south of the Ancre.⁴² The Brophy diary describes one such raid, on 11 July:

The chief kicks about our bomb-raids ha[ve] been the poor formation, leaving us in danger of being separated, and 'done in' by huns. The Colonel[†] decided he'd lead us to show us how. He was to lead and Capt. Carr and I were next, and four others in pairs behind, and nine scouts. At 6,000 we met thick clouds, and when I came through I couldn't see anyone anywhere, so I just flew around and finally sighted 3 machines. I went over and found Carr and the Colonel, and two scouts, so I got into place and the Colonel went over to the lines, and kept circling to get higher for half an hour, right over the lines. I thought this was a foolish stunt, as I knew the huns could see us, and would be waiting for us. I was very surprised that they didn't shell us, but there was a battle on, and they were probably too

* It was a policy that was to be questioned from the beginning, however. In England Sefton Brancker and Sir David Henderson 'discovered without surprise, that Sykes was damning it in private at a time when the unfinished Air Enquiry provided an easy platform for the disgruntled and misinformed.' Andrew Boyle, *Trenchard* (London 1962), 185

† Presumably Lieutenant-Colonel H.C.T. Dowding, the officer commanding 9 Wing.

busy. We were right over Albert, as I recognized two huge mine craters that had been sprung July 1st. When we did cross over with only two scouts, we hadn't been over more than a couple of minutes before I saw 3 Fokkers coming towards us, and a couple of L.V.G.'s climbing up to us. Another Fokker was up above me, and behind, between our two scouts. I knew he was going to dive at one of us, but expected the scouts to see him and attack him, so I didn't bother about him, but began to get the stop-watch time of my bomb-sight to set it for dropping. While I was doing this I suddenly heard the pop-pop-pop's of machine guns, and knew the huns had arrived. I looked and saw them diving in amongst us, and firing. There were seven L.V.G.'s and 3 Fokkers as far as I could make out, but they went so fast I could hardly watch them. Our scouts went for them, and I saw the Colonel turn about. My gun being behind me I couldn't get in a shot, and turned around after Carr and the Colonel. They fired some more as we went back but didn't hit me. The Colonel was hit and so the show was over. He had about a dozen bullets in his machine, and was hit in the hand. His gun was shot through, and his observer hit in the face. He probably won't try to lead us again.⁴³

This somewhat breezy account reveals that the RFC's air dominance was by no means all-pervasive, and that in their own rear areas the Germans could react vigorously to bombing attacks, especially to those in which close formation had been lost.

Trenchard tended to spread his targets very widely along the whole front, but certainly not indiscriminately. Between mid-July and early August he favoured the triangle formed by Douai (an important railway junction), Oppy (billets and supply dumps), and Corons, whose dumps on the Douai-Arras rail line were attacked by the night bombers. Naturally most of the bombing in this period was directed against targets immediately behind the German third line of defence at the Somme; Bapaume, Irles, Le Transloy, Thillois, Beugny, Rocquigny, Sailly-Saillisel, Epehy, Marcoing, Cambrai, and Aubigny-au-Bac all were attacked at least twice. In August, too, the largest number of raids were behind the Somme front, but such raids were co-ordinated with attacks elsewhere, including some by the RNAS at Dunkirk. Trenchard also directed corps squadrons north of the Ancre to carry out daily raids against German troops, using groups of about five aircraft; target selection was left to corps staff to approve and attacks on towns and villages took place only at the request of army and corps commanders.⁴⁴

In September the growing German strength in the air led the RFC to begin systematic bombing of enemy aerodromes as well. None of these raids caused heavy damage, though they stirred up a certain amount of enemy air activity. Flight Sub-Lieutenant Charles Sproatt of Toronto, flying a Caudron with 5 (Naval) Wing, recorded that only three or four aircraft out of a formation of fourteen, fighting a heavy rainstorm, managed to find St Denis Westrem, although they were attacked by enemy aircraft. Lieutenant P.C. Sherren of Crapaud, PEI, with 27 Squadron, dropped six 20-lb bombs from 10,000 feet on Beaucamps aerodrome (he claimed that two hit it, surely with little effect) before he was attacked by a Nieuport with French markings!⁴⁵

Few attacks were made at such high altitudes. Usually when raiding dumps and billets, aircraft flew at around 6000-8000 feet, and came much lower when attack-

ing railways. Much of the railway bombing continued to be done by 27 Squadron. Three Canadians, P.C. Sherren, H.S. Spanner of Huntsville, Ont., and E.D. Hicks of Winnipeg took part in most of them. On 15 September Sherren came down to 500 feet to drop two 112-lb bombs on Gouzeaucourt station; he claimed to have destroyed an engine and an ammunition train. Nine days later Hicks bombed a train at Aulnoye from 400 feet, destroying the engine and damaging some coaches, according to his report. On 16 November Sherren, by this time a captain and shortly to be gazetted for the Military Cross, led a formation of six Martinsydes from the squadron's airfield at Fienvillers to attack the important railway junction at Hirson, ninety miles distant. From a thousand feet their bombs blew six coaches off the track, destroyed other rolling stock on sidings, and caused the collapse of two station buildings. All six returned after a four-and-a-half-hour flight, very close to the limit of the Martinsyde's endurance.⁴⁶

Most bombing raids were merely of nuisance value, their chief importance being to divert and hold German air units from the immediate battle zone. But the brunt of Trenchard's offensive policy fell upon the fighter squadrons. When the Somme battle began many of the German fighter units were still equipped with the Fokker *Eindekker*. This machine, a terror in its time, was no longer a match for later British types and in fact had become an easy victim. On 18 June the great Immelmann, flying an E-III, met his death at the hands of an FE2b crew from 25 Squadron. On 29 July Lieutenant A.M. Thomas of Toronto and his British observer, flying a 22 Squadron FE2b, encountered eight enemy aircraft, including several *Eindekkers*, over the Bapaume-Peronne road. They immediately attacked one of them, Thomas firing a drum of ammunition and his observer two more from eighty yards range. 'The machine spun and was nose-diving to earth when last seen,' Thomas reported. 'At this moment we were attacked by other Type E which retired when we opened fire ...'⁴⁷ Another example comes from a report by Second Lieutenant C.S. Duffus of Halifax, also with 22 Squadron, of a patrol over the Fourth Army front on 23 August: '... we saw an F.E.2b doing photography N[orth] of LE SARRS. We followed this machine going E[ast] of it, when we saw 5 H[ostile] A[ircraft], type E, coming from BAPAUME, evidently with the intent to attack the photographic machine. We dived at the H.A., opening fire at about 500 yards. The H.A. immediately split up their formation, diving and making off in all directions. We closed with one machine firing two drums into it and actually set it on fire but after a few seconds the flame went out. The H.A. then dived rapidly for ground.'⁴⁸

These were probably E-IIIs or E-IVs, the last versions of the series produced by Fokker. In mid-1916 German squadrons had begun re-equipping with a new generation of Fokkers, the D-I and D-II biplanes. The Fokker D-I had an in-line engine, was clumsy in manoeuvre, and had a slow rate of climb; the D-II, with a lighter rotary engine, was more manoeuvrable but no faster. Both were re-engined (as the D-III and D-IV) without much improvement in performance, but neither aircraft had a long operational life. When superior types became available later in the summer, the Fokkers were sent to the Eastern Front or used as trainers.*

* The Fokker D-V, a much improved version of the rotary D-III, came into service in September 1916. It had a top speed of 106 mph.

Much superior to them were the Halberstadts and Rolands. The first Halberstadt fighter had appeared in 1915; in 1916 it was re-engined like the Fokkers and it turned out to be a better aircraft. With a top speed of only 90 mph the Halberstadt D-II was nevertheless an exceedingly agile and strongly-built little machine, a formidable opponent for British airmen. Another good fighter which came into service in July was the LFG Roland D-1, an aircraft with clean lines and a large streamlined spinner. Though not so handy as the Halberstadt, it was much faster; more important, it was armed with twin Spandaus firing forward, making it the most heavily-armed single-seater on the Western Front.⁴⁹ All these aircraft were faster than anything the RFC had, but the British still had numerical superiority and a strong offensive spirit.

Canadian casualties from mid-July to mid-September illustrate the shift in the balance of the air war. In late July there were no casualties whatever among Canadians in fighter squadrons, but in August seven were killed, and in the first part of September three were killed and one wounded. Corps squadron casualties among Canadians were much lighter: two in July (one wounded, one captured), five in August (one killed, two wounded, and two captured), and three in the first half of September (two killed, one wounded). As it happened, two-thirds of the Canadians in fighter squadrons were with units involved in the fighting over the Somme front. An analysis of squadron records and RFC communiqués shows, not surprisingly, that most combats in the air involved 9 Wing and IV Brigade squadrons. Of these, 24 Squadron took part in more combats than any other unit.⁵⁰

This squadron, under the leadership of Major Lanoe Hawker, had pioneered in the development of RFC formation fighting tactics.* Hawker was an outstanding pilot who had first come to France in October 1914 with 6 Squadron. In 1915 he had won the Victoria Cross – the first pilot to do so – and in September of that year had been given command of the newly formed 24 Squadron. He personally instructed most of the pilots who joined the squadron from the Central Flying School. When the unit went to France in February 1916 only one Canadian, Second Lieutenant R.H.B. Ker of Victoria, was among its pilots. Ker left in mid-July to become a flight commander with 41 Squadron. When the squadron expanded from twelve to eighteen pilots in May, however, four other Canadians joined it. They were Second Lieutenants H.A. Wood, a civil engineer from Toronto; A.G. Knight, who had joined the RFC in Canada on leaving the University of Toronto; H.C. Evans, thirty-seven years old, an Alberta rancher, and a veteran of the Boer War who had transferred to the RFC from the Alberta Dragoons in 1915; and A.E. McKay of London, Ont., who had learned to fly at the Wright School in Augusta, Georgia. All these pilots had outstanding careers.

* After Major R.R. Smith-Barry took over 60 Squadron in August, he also advocated formation tactics. Some airmen opposed this trend, notably the officer commanding 11 Squadron, which had been the first homogeneous fighting squadron on the Western Front. Trenchard had no patience with such views and suppressed them without ceremony. His pencilled comments on a communication from this officer were scornful: 'What does he mean ... bunkum ... no ... vague ... rot.' To the suggestion that 'Enemy A.A. fire is becoming so good that possibly in a year's time no flying in daylight over hostile areas will be undertaken except on special missions' he commented: 'This really shows this officer wants a rest.' See 'Notes on Aerial Fighting,' 15 Aug. 1916, Air 1/920/204/5/885.

Before he was killed on 3 September 1916 Evans won the Distinguished Service Order and a Mention in Despatches; Knight received the DSO and Military Cross before meeting his death at the hands of Manfred von Richthofen in December; Wood gained the MC in 1917 and was considered an 'ace' at the end of the war; and McKay, although he received no decorations, was mentioned in communiqués frequently, being credited with two enemy aircraft destroyed and five or six out of control before he was killed on 28 December 1917.⁵¹

Pilots of 24 Squadron flew out of an airfield at Bertangles and most of their combats took place over German lines in the triangle formed by the Bapaume-Albert road, the Bapaume-Peronne road, and the German trenches between Pozières and Bouchavesnes. Some or all of the four Canadians on the squadron were involved in more than twenty combats between 14 July and 15 September.⁵² Their DH2s flew in formations of four to six, usually at 10,000 feet at the beginning of an offensive patrol. The point drummed into them all was to attack first: 'In addition to the moral ascendancy gained by offensive tactics, the material advantage in aerial fighting is with the attacker. Every machine has its blind side ... All the machines should concentrate on the leader's opponent. This has a great moral effect and prevents our formation from splitting up.'⁵³

On 20 July 24 Squadron was heavily embroiled with German fighter forces and its Canadians took part in four air battles during this day. The last of them, fought out between 2020 and 2045 hrs over High Wood opposite the right flank of the Fourth Army, involved McKay, Evans, and two British pilots. Their patrol encountered five LVGs (presumably the C-II, the German air force's equivalent of the BE2c as maid of all work) escorted by three Roland D-IIs and three Fokker E-IIIs. The highly manoeuvrable DH2s were at their best in the confused *mêlée* that ensued: '... Lieutenant Evans closed with a Roland and fired half a drum at a range of only 25 yards. The Roland went straight down apparently out of control, and Lt. Evans was attacked from behind by two Fokkers, but these nearly collided and Lt. Evans escaped them and attacked an LVG firing the remaining half of his drum.' Meanwhile, McKay was having his problems: 'A Roland dived at him from in front, but Lt. McKay outmanoeuvred it and attacked, firing the remainder of his drum. The Roland ceased fire and fell in a spinning nose dive. Lt. McKay was now attacked by a Fokker which he could not outmanoeuvre owing to his engine being shot, so to escape its fire, he descended in a steep spiral. Lt. Chapman observing this, dived to the rescue and attacked the Fokker at 1000 feet over HIGH WOOD. The Fokker fell into a spinning nose dive, hit the ground ... and burst into flames ... Meanwhile Lt. Evans attacked and drove off an LVG and a Fokker. All H.A. had now been driven off ...'⁵⁴

On the basis of reports from British anti-aircraft batteries McKay and Evans were credited with a Roland apiece. Two weeks later Evans attacked an LFG Roland C-II (the fast two-seater which had inspired the Roland D-II) over the Bapaume-Peronne road: 'The observer was either hit or else his gun jammed as he waved his arm at me. I put on another drum and waved to him to turn West but he kept on diving E. I fired a burst at him and the machine went down vertically turning over and over.'⁵⁵ The Roland, having refused quarter, crashed east of Bois des Vaux. Again, on 14 September, when five DH2s were escorting a 22 Squadron

bombing attack on Bapaume, Knight and a British sergeant pilot combined to attack a German single-seater: 'Sgt Cockerell at once opened fire and Lt. Knight at once followed up, getting on to the H.A.'s tail and firing about 15 rounds at very close range. The Pilot fell forward, and flames came out of the cock-pit which gradually enveloped the whole machine. After falling 1500 ft., the wings came off and the remains hit the ground near MANANCOURT. The other H.A. turned East and disappeared.'⁵⁶ The same pair, along with Wood, employed similar tactics over Bapaume to account for another German fighter on the following day.⁵⁷

At the end of August and the beginning of September a sudden surge in enemy air activity led Trenchard to conclude, correctly, that the air battle was entering a new and even more testing phase. But nothing could shake his total commitment to an offensive doctrine. As he emphatically restated it: 'The sound policy would seem to be that if the enemy changes his tactics and pursues a more vigorous offensive, to increase our offensive, to go further afield, and to force the enemy to do what he would gladly have us do now. If, on the other hand, we were to adopt a purely defensive policy, we should be doing what the French have learnt by experience to be a failure, and what the rank and file of the enemy, by their own accounts, point to as being one of the main causes of their recent reverses.'⁵⁸

Offensive spirit alone was hardly enough. Trenchard cast his eyes longingly upon the Sopwith 1½ Strutters of the RNAS as the means to tide the RFC over its crisis in aircraft supply. General Henderson and the Admiralty had been talking since July, in very general terms, about the possibility of drawing upon naval resources in case of a breakthrough at the Somme and Henderson had found an ally in Lord Sydenham of the Air Board.* Now Trenchard suggested to Haig, in the course of reporting the advent of a formidable new German fighter, the Albatros, that the Admiralty be asked to replace the RFC's 18 Squadron which was being withdrawn from the front to undertake co-operation with the cavalry.⁵⁹

Meanwhile Trenchard had to turn his attention to the major attack scheduled for 15 September. In briefing the airmen of 9 Wing he was full of aggressive fire: 'No German machines could be allowed near enough to the lines for any observation. We must shoot all Hun machines at sight and give them no rest. Our bombers should make life a burden on the enemy lines of communication. Infantry and transport were to be worried, whenever possible, by machine-gun fire from above. Machines would be detailed for contact work with our infantry. Reconnaissance jobs were to be completed at all costs, if there seemed the slightest chance of bringing back useful information.'⁶⁰

When it came to the actual attack at Flers-Courcelette the RFC emphasized even more than usual the necessity of silencing the enemy artillery. Corps

* RFC airmen, immersed in the tense day-to-day struggle on the Western Front, tended to take a jaundiced view of the RNAS and its 'easier' life. Don Brophy, while on leave in London from his work with 21 Squadron, set down in his diary impressions which were not untypical of RFC thinking. The RNAS, he wrote, was known in the RFC as the Hot Air Service; its pilots 'receive military crosses if they fly in winter weather ... They have an enormous mess in the [Crystal] Palace, and sit down when they drink the King's Health ... The place was alive with Naval youths, whom I scorned and classed with the Army Service Corps ... They sure have a nice place at the Crystal Palace. but it is not war.' Diary, 21 Aug. 1916, J.B. Brophy biographical file, DHist

machines took part in more than a hundred counter-battery shoots and successfully directed the guns to numerous other targets. For the first time field as well as heavy artillery was included in 'zone' or area calls, a method by which aircraft could bring down concentrated fire upon important targets. Area calls were used repeatedly to direct fire against hostile batteries and targets of opportunity. For example, Second Lieutenant Norman Goudie of Kamloops, BC, flying one of 34 Squadron's artillery patrols with his British pilot, sent four area calls during a flight of over three hours: one against a hostile battery, two against enemy transport, and one against 'guns moving off towards LE SARS.' Goudie reported 'good shooting,' and, as all observers on this day were careful to do, the specific location of a 'tank with red flag' seen near Martinpuich. There were very few reports by artillery aircraft of failure to make and hold contact with the guns, nor do interruptions from hostile machines appear to have been frequent. Despite this, German artillery fire remained heavy throughout the day, a testimony to German skill in siting and masking their batteries.⁶¹

For the whole of the RFC 15 September was a day of maximum effort. Never since the war had begun had so many operational hours been flown and so many combats taken place on a single day. Never had so much emphasis been placed upon aerial reporting of the course of the battle. At the time of the initial assault corps squadrons provided two contact patrols and continued such patrols throughout the day, while Army and GHQ staffs were directly served by special patrols. Even before the attack was launched Lieutenant A.M. Thomas of Toronto, with his observer, was flying a dawn patrol for 22 Squadron and reported 'intense artillery activity' and 'big explosions' at Martinpuich and Courcellette. In addition to Thomas' early patrol, the FE2bs carried out a photo reconnaissance between 0930 and 1130 hrs. One of the photographic machines was flown by Captain W.R.C. Da Costa of Toronto, while Captains C.M. Clement of Vancouver and W.L. Scandrett of London, Ont., flew two of the three escorting aircraft. Clement's probationary observer was J.K. Campbell of Scotsburn, NS, a corporal in a divisional signals unit. While this reconnaissance was in progress, another observer on probation, Private J.S. Williams of the Canadian Army Service Corps, was flying a line patrol with a British pilot. Williams reported that he dropped four bombs on Le Sars. Then, as his pilot let down, he 'fired on small parties of men from 2000 ft. over Le Sars and East Thiepval.' Major C.S. Duffus concluded what was, for this period of the war, a remarkable degree of participation by Canadians in the work of a single squadron by carrying out a mid-afternoon patrol and reporting slight enemy air activity.⁶²

Such work, repeated all along the line, ensured that commanders and staffs were more abundantly and accurately informed than ever before. Contact patrols had been particularly successful. The infantry used flares much more intelligently (though it was reported that some isolated advanced parties had done so too freely) and Klaxon horns were now in general use. Observers could identify troops at distances up to 700 feet and in good light could ascertain trench occupation at heights up to 2000 feet. Aircraft were plainly making some headway in dispelling the fog of battle; the 2nd Canadian Division, for example, reported flatly that the position of its most advanced troops during the attack had been established only through intelligence from contact patrol aircraft.⁶³

German regimental histories confirm that the RFC held sway over the battlefield, not only on 15 September but during the preparatory phase prior to the attack and for a period following it. The 211th Reserve Regiment, which went into the line opposite the Canadians in the Pozières sector on 7 September, discovered that on the first morning in their new position 'swarms of planes are passing over our trenches.' The infantry reacted with small arms fire, but this brought 'heavy artillery fire on our lines.' From earlier experience on the Somme the regiment had become almost fatalistically resigned to enemy air dominance: '... even when later on our own planes take to the air to free us from our disagreeable tormentors, the British reconnaissance planes do not allow themselves to be disturbed, but strong enemy defensive formations pounce on our airmen who cannot dare to become seriously embroiled with such superior forces. This we had to endure all summer; from early to late enemy planes continuously overhead, watching every movement; work on the trenches as well as all arrivals and departures. Disgusting! Nerve-shattering!'⁶⁴

Another German unit on the Canadian front, the 209th Reserve Regiment, found that on 13 September enemy artillery fire on Thiepval was extremely heavy, but that the German guns were 'firing blindfolded' in reply because ranging from the air was impossible. 'Our own airmen must remain satisfied with keeping the enemy long-distance planes in check.' On 14 and 15 September 'droves' of RFC machines attacked the regiment's trenches and dug-out entrances with machine-gun fire. Misconstruing the work of trench patrol aircraft, the regimental history conjectured that 'apparently they are directing the artillery fire too, for from time to time they are giving signals with the [Klaxon] hooter.'⁶⁵

Yet the period of RFC ascendancy was even then coming to an end. The beginnings of German resurgence in the air can be traced to the appearance of such good German fighters as the Roland and the Halberstadt. These aircraft had started to take a toll of the weaker RFC squadrons not long after the Somme battle had begun. For example, 60 Squadron, equipped with obsolete Morane Parasols and biplanes, had lost its squadron commander, two flight commanders, three pilots, and two observers, as well as several others wounded between 1 July and 3 August.* Lieutenant-Colonel Hugh Dowding, who commanded the wing that included this squadron, and who was one of the few officers of his rank who still flew on operations, asked that the unit be temporarily withdrawn into reserve. Trenchard took the unusual step for him of resting the squadron, observing that 'They have a very difficult machine to fly, and I think a rest from work is absolutely necessary.' But Dowding's approach left him uneasy and in a letter to Sefton Brancker he stigmatized Dowding as a 'dismal Jimmy' whom he proposed to replace as soon as that could be conveniently arranged.† When 60 Squadron returned to action it had been partly re-equipped with a very good single-seater, the French-designed Nieuport 17. This fast scout, with a top speed of 107 mph, mounted a single machine-gun firing forward over the top plane.⁶⁶

* Among the casualties was Lieutenant J.A.N. Ormsby of Danville, Que., who died of his wounds after being shot down on 2 August.

† Dowding was posted to the Home Establishment six weeks later. In 1940 he was to lead Fighter Command in the Battle of Britain, before being unceremoniously dumped once again.

The Nieuport had a useful life as a first-line fighter, especially in the hands of pilots like W.A. Bishop. Other things being equal, however, it was outclassed by the Albatros D-1, which first reached the front in early September. The Albatros was an important, almost revolutionary, advance in aircraft design; the fuselage was of semi-monocoque construction, being formed of plywood bent into place around the longerons, and except for its awkward, box-like radiators, from the tip of its large spinner to its rounded tail surfaces the Albatros was sleekly tapered and streamlined. It was also the most powerful fighter in existence, its engine (either the 150-hp Benz or the 160-hp Mercedes) giving it a top speed of 109 mph. This power plant made it possible for the Albatros to mount twin Spandaus firing forward through the propeller arc. Previously only the Roland had successfully carried such armament; attempts to mount twin machine-guns on the Halberstadt and Fokker D-IIIs and IVs had failed.⁶⁷

The Albatros, through its successive modifications, remained the standard German fighter for the rest of the war, though it was later eclipsed by the Fokker D-VII. The Albatros D-1, however, did not immediately sweep the skies clear of DH2s and FE2ds. Though in most respects far superior to these aircraft, its weight, power plant, and armament combined to give it a wing loading of 8 pounds per square foot as against 5.5 for the DH2 and 5.7 for the FE2b.* Consequently, it could not turn nearly as sharply, and their superior agility, larger numbers, and aggressive tactics meant that RFC fighter pilots could still often hold their own in dogfights.

Indeed, more than new aircraft was needed to correct the imbalance in the air. The High Command, according to the German official history, had recognized that a chief characteristic of the Somme battle was 'the extraordinary increase in importance of the air force to the battle on the ground ... Control of the air over the battlefield had now become imperative for success.' Even before the team of Hindenburg and Ludendorff replaced Falkenhayn at the end of August, steps to reorganize the air arm had already been taken. The shake-up thus begun ultimately culminated, on 8 October, in the establishment of the German air force, with Ernst von Hoeppner as its Commanding General.⁶⁸

The single most significant innovation was the decision to distinguish air fighting units from 'working aeroplanes' carrying out artillery co-operation, reconnaissance, and other duties. This development had, of course, long been anticipated by the British and French flying services. The new fighter units, called *Jagdstaffeln* (*Jastas*), were slightly smaller than an RFC squadron, having an establishment of fourteen aircraft. Seven had been formed in late August and early September, the first, *Jasta 2*, under the command of the redoubtable Oswald Boelcke.

Before the Somme campaign dragged to its close in November, German technological superiority, revised organization, and better tactics had put an end to the superiority of the RFC and had given the German air force a lead it did not relinquish until the arrival of the Sopwith Camel and the SE5a, well into 1917. The German resurgence in the air, however, made itself felt only gradually, not only

* The Albatros D-II had a larger wing area and weighed slightly less than the D-1, reducing the wing loading factor to 7.4.

because the RFC still had the advantage of numbers as well as skilful and determined airmen, but also because faulty German air dispositions took time to correct and because the new Albatros types were not available in quantity until late autumn. Although transfer of air units from the Verdun front had begun in early September, by the end of that month there were still only three *Jastas* in the Somme area to assist twenty-three reconnaissance and artillery flights and sixteen bomber-fighter squadrons. By the middle of October, however, almost six hundred machines had been concentrated on the Somme front. Most were still C types, but nearly a hundred Albatros D-Is and D-IIIs were now in service.⁶⁹

The steady rise in German air strength can be traced in the casualties of RFC corps squadrons during the last two months of the Somme battle. In the week following the limited gains of 15 September, as the Fourth and Reserve Armies struggled, without much success, to advance the line, the RFC continued its work according to the pattern established on the first day of the battle. But losses in the air were the heaviest since the first week in July, and included five Canadians.^{*70}

Desperate ground fighting continued throughout October and the last convulsions of the Somme battle came between 13 and 19 November, when the Fifth Army captured Beaumont-Hamel and Beaucourt. During this period corps squadron work was spotty, partly because of the deteriorating weather, partly because corps aircraft were having to fight to get their job done. On 9 October, for example, Lieutenant R.H. Jarvis of Toronto, flying an artillery patrol near Loupart Wood for 4 Squadron, was attacked from above by an enemy aircraft. Jarvis turned to fight, 'but at that moment the BE2c was hit by an A.A. shell which severed the aileron control wire and made several holes in machine.' His British observer was stunned when hit on the head by a piece of shell, but the two managed to return safely. On 17 October Jarvis was once more attacked by 'two Rolands with wings coloured brown with green blotches and with blue crosses.' Though he succeeded in repelling the attack, his shoot was disrupted; he noted in his report that 'None of our machines were in the vicinity at the time.' Similarly, on 20 October, Lieutenant F.W. Carter of Orillia, Ont., flying a photographic mission in the Miraumont sector for 15 Squadron, was attacked by six biplanes, one 'faster than the rest.'⁷¹

On the same day, in precisely the same area, Second Lieutenant W.M.V. Cotton, until very recently a driver in the Canadian Army Service Corps, and his British pilot from 7 Squadron, were attacked by five Rolands while engaged on a counter-battery shoot. The two defended themselves stoutly. Cotton described the action: 'The five H.A. ... turned and dived upon us, 2 of the machines opening fire at about 500 yards. I did not reply until they were within 150 yards, and opened fire on the leading machine who immediately turned North on a steep bank. Then I emptied about 25 rounds into him and immediately emptied the remainder of the

* These were D. Cushing of Montreal from 2 Squadron (POW 16 Sept.); W.M. Kent of Bathurst, NB (WIA 24 Sept.) from 7 Squadron; 11 Squadron's H. Thompson of Port Arthur, Ont., who died of his wounds on 18 September; E.S. Duggan of Toronto (WIA 17 Sept.) from 21 Squadron; and W.J. Gray of Weyburn, Sask., captured while flying with 22 Squadron on 21 September.

drum into the second machine which had turned South. The first machine made a steep nose-dive for about 1000' and then glided down apparently under control to the ground at about G7a. I could not see whether the enemy machine was damaged on landing.⁷² From these and similar incidents it is evident that RFC fighter squadrons were no longer able to provide the same measure of security to corps aircraft that they had done earlier in the year.

The ground forces were quick to notice the change in the air environment. During October the strafing of troops by low-flying German aircraft had become more and more frequent. On 7 October a Canadian battalion commander who only three weeks before had extolled the virtues of the RFC observed that 'Our aircraft were not as bold or efficient as usual.' During the Fourth Army attack of 23 October, despite dense fog and low clouds, German aircraft flew low over XIV Corps with no rejoinder from the RFC. On 9 November Trenchard attempted to take the pressure off by the bombing of enemy rear areas.⁷³ The device was not a success, as the RFC communiqué made clear: 'A bombing raid of the 3rd Brigade consisting of 16 bombing machines and an escort of 14 was attacked on its way to Vraucourt by at least 30 Germans, chiefly fast scouts. The enemy attacked from the front, and our scouts dived and got to close quarters with them. As the fight progressed the escort got gradually below the bombing machines. Meanwhile the enemy was reinforced and the bombers were attacked from both sides. Numerous individual fights ensued.'⁷⁴ Two BE2cs and two DH2s failed to return and three other escorting aircraft were damaged and members of their crew killed or wounded.

As the record of air fighting from mid-September to the end of the year demonstrates, the German *Jastas* only gradually established their superiority, and, at least in 1916, never obtained the degree of dominance the RFC had enjoyed earlier in the Somme battle. German tactics were less aggressive than those of the RFC, and the Germans never established the kind of numerical superiority that would have enabled them to blanket the efforts of a stubborn opponent. The combat reports of RFC pilots, however, make clear that not only had the air war entered a new phase, but that the pilots themselves were fully conscious that technically they had become the underdogs. On 17 September Boelcke blooded *Jasta 2* in spectacular fashion; before their guns 11 Squadron alone lost four FE2bs and 12 Squadron two BE2cs. Also suffering were 23, 27, and 70 Squadrons. A patrol of five DH2s from 24 Squadron, including the Canadians A.G. Knight and H.A. Wood of Toronto, had a tantalizing encounter with fast enemy scouts over the Bapaume-Peronne road. They repeatedly attempted to close with the Germans, but were 'unable to get to close range' except in the case of a single aircraft surprised by Wood and another pilot, which then 'completely outclimbed and outpaced' the de Havillands.⁷⁵

After a day of poor weather Boelcke was in the air again on the 19th. FE2bs of 11 Squadron, escorted by 60 Squadron's Nieuports, were unable to complete a reconnaissance to Quéant, turning back after a running fight of some duration. Two FE2bs of 18 Squadron photographing the lines were repeatedly attacked; one was shot down near Flers. Their escorts, four DH2s from 24 Squadron whose pilots included Knight and Wood, fought for three hours, Wood having to make a

forced landing. The tempo of this day's fighting was caught by a German anti-aircraft officer at Achiet-le-Petit. He saw seven German biplanes in formation join battle with a large formation over Irlles. The British machines seemed to be 'attempting to form squadrons and chains and to seek greater heights ... in curves, the red-blue streamers of their leading airplanes clearly visible.' The German aircraft outclimbed their opponents and then dove into their midst, while other pilots, attracted by the *mêlée*, hastened to take part. 'To the observer,' he wrote, 'it looks like a sensational moving picture being run off too fast. Here and there aircraft coming down in flames, others, rendered rudderless ... slithering down awkwardly.' Trenchard's personal directive to RFC airmen, issued this same day, was expostulatory but from the point of view of the combat pilot not particularly helpful: '... driving hostile machines away from our line is not sufficient. The pursuit and destruction of hostile machines must be carried out with the greatest vigour.'⁷⁶

That is exactly what Lieutenant C.L. Bath of Toronto and Second Lieutenant G.H. Bonnell of Halifax attempted to do on the 22nd, when flying as part of a 32 Squadron offensive patrol in the Flers-Le Transloy-Le Sars area. Bath spent the better part of two hours trying to catch up with three patrolling German fighters, but could neither overtake them nor reach their altitude. Bonnell, on the other hand, may well have shot down one of three German scouts he encountered attacking an FE2b, but a later attempt to pursue two German fighters returning to base ended in failure: 'They were very fast, and got away.'⁷⁷ The next day Trenchard conceded that the new German aircraft were faster than anything the RFC had. For the 24th, therefore, turning to quantity in the absence of quality, he ordered sixty aircraft to attempt the destruction of the new types in the Cambrai area, where they had been particularly active. The luck of some of the Canadians on this sweep was typical of the day's results: C.J. Creery of 21 Squadron got off a few rounds at a pair of German fighters and some LVGs, without result; H. Spanner of 27 Squadron had a brush with another fighter at 13,500 feet, again without result; Second Lieutenant J.S. Williams of Vancouver, an observer with 22 Squadron, was credited, together with his pilot, with the destruction of a Fokker *Eindekker*. Aside from this museum piece, and vague claims of other victories, the RFC had little to show for the operation; moreover, they lost two outclassed BE12s and suffered other casualties. If this was an attempt to recapture the initiative, it was a distinct failure.⁷⁸

There were still victories to be had. On 20 October Lieutenant F.S. Rankin, a 1914 RMC graduate from Woodstock, NB, who had joined 18 Squadron in May, was flying an FE2b patrol near Le Sars with his British pilot when their aircraft was attacked by 'White biplanes. Very fast. Looked like Rolands.' They engaged at least four enemy aircraft in a fight that spiralled from 10,000 feet to 2,000 feet; after Rankin had emptied a drum at one enemy machine 'it was observed to descend steeply and crash in a shell hole ...'⁷⁹ Most days, however, were more like 22 October. On a dawn patrol Second Lieutenant C.M. Clement of Vancouver and his British observer, together with another 22 Squadron FE2b over Sailly Saillisel, easily drove off four Fokker E-IIIs, but then were attacked by 'two small brown machines which dived on us in front and endeavoured to get on our tail.' Despite

the assistance of some DH2s the enemy fighters proved a handful. As Clement reported, one of them 'began manoeuvring very quickly and by a good stall succeeded in getting above us. The engagement then became very close, the H.A. attempting to get on our tail and we endeavouring to prevent it ... It did some very good shooting and was so quick that it succeeded in keeping behind and to the sides of us most of the time.' By this time Clement was down to 800 feet over Le Transloy and running for home; he finally landed at 9 Squadron's airfield instead because 'the machine was considerably shot about.' Later the same day Haligonian G.H. Bonnell and four companions from 32 Squadron were on offensive patrol when their DH2s were attacked by overwhelming numbers of Rolands, Albatroses, and 'German Nieuports.'⁸⁰

During the afternoon Rankin and his British pilot, F.L. Barnard, were embroiled in a series of fights while escorting a photo reconnaissance mission. Barnard reported:

When escorting a camera machine over BAPAUME we attacked one of several H.A. which were in the neighbourhood of camera machine ... Shortly after two more appeared above us ... When these had been driven off we turned for home ... but found three more H.A. on our tail ... The observer put one drum into one which was passing straight over our heads at very close range, and this machine immediately became out of control, the tail and back of fuselage being on fire. It went down in a spin. The remaining two H.A. were now firing from behind and the observer stood up to get a shot at them ... one more H.A. was seen to go down in a nose dive with smoke from its engine ... The observer was still firing when he was hit in the head and fell sideways over the side of the nacelle. I managed to catch his coat as he was falling, and by getting in the front seat pulled him back. I then got back in the pilot's seat. The engine and most of the controls had been shot but I managed to get the machine over our lines and landed 200 yards behind our front line ...⁸¹

Rankin had been wounded before, on 1 September; this time his wound proved fatal. The same day three Sopwith 1½ Strutters of 45 Squadron failed to return from their first offensive patrol; among them was Second Lieutenant W.H.F. Fullerton of Edmonton.⁸²

The factors which brought the eclipse of the RFC's fighter superiority can be summarized in the combat experience of a single pilot, Alan Duncan Bell-Irving. In 1915, as we have seen, he had spent three months as an observer with 7 Squadron; after being wounded he had trained as a pilot in England and joined 60 Squadron in April 1916. By August he was a thoroughly experienced and combat-wise pilot, certainly one of the ablest on his squadron, but no battle skills could turn the Morane scout into an aircraft capable of dealing with the newer enemy types. On 28 August (his birthday) Bell-Irving flew his last mission in a Morane, a dispiriting one in which he was unable to come to grips with three German aircraft he encountered. By 14 September he was flying a Nieuport 17, a great improve-

* The German Siemens-Schuckert D-1 was a direct copy of the Nieuport 17, and was often called the German Nieuport by the RFC.

ment over the Morane but still not capable of meeting the best enemy machines on equal terms.⁸³

Bell-Irving was one of the first pilots to employ the new 'compass stations' designed to direct patrolling fighters upon enemy aircraft from the ground. While flying near Grandcourt on 22 September he 'observed BEAUMETZ arrow in position ... I followed it and observed a hostile machine ...' Diving on the machine, which he identified as a Roland, he found it to be faster than the Nieuport. The next day, however, while escorting a bombing formation, he managed to close to within twenty yards of a Roland and after opening fire was able to see it crash to the ground. His squadron commander, Major Smith-Barry, confirmed another Roland which Bell-Irving shot down on 30 September. By this time he had had several frustrating experiences with Albatros D-Is or IIs; 'with their noses only slightly down they were faster' than his Nieuport, he reported.⁸⁴

By late October Bell-Irving, like his fellow fighter-pilots, was finding the strain great. An encounter with Roland scouts on 21 October must have added to the stress. While escorting FE2bs and BE2cs south of Arras, he turned to engage the enemy fighters:

After firing about 8 rounds my gun stopped ... and I was temporarily unable to rectify it. I turned west, and climbed, trying to put the gun right and reach another Nieuport which was higher & further west. The H.A. turned and out climbed me so I put my nose down to get over the lines. A bullet then hit my tank and I stopped up one of the holes with my hand, having to leave the gun. The H.A. shot away a flying wire and damaged my planes on the right side so that my machine became uncontrollable. After falling for some distance I regained partial control with my engine off and full rudder and aileron. I glided across the lines without directional control at about 100 feet, landing between front and support lines. I jumped clear as the machine ran into a trench and turned over.⁸⁵

On 9 November he was shot down once again, this time while endeavouring to fend off a swarm of Halberstadt fighters bent on attacking a bombing formation of BE2cs. During the fierce engagement bullets from a German aircraft set his Very light cartridges afire; he spun his Nieuport to 200 feet over Le Transloy to extinguish the blaze and landed just behind the trenches. 'Sometime during the fighting,' Smith-Barry reported, 'Lieut. Bell-Irving was wounded in both legs.' It was the end of his combat flying.⁸⁶

The loss to the RFC of such experienced and able pilots as Bell-Irving was now a frequent occurrence. A short time before, however, the German air force had received a heavier blow. On 28 October Knight and McKay were on an afternoon patrol between Pozières and Bapaume when they were attacked by six Halberstadts. As the fight developed six Albatros D-Is and IIs of *Jasta 2* joined in. The two Canadians found themselves in desperate straits, and they had to make the most of the DH2's agility:

The H.A. dived in turn on to the de H's tail, but the de H. promptly turned sharply under the H.A., which usually switched on and climbed again. The de H's were very careful to avoid diving straight at any H.A. that presented tempting targets, but fired short bursts as

H.A. came into their sights. It was after about 5 minutes of strenuous fighting that two H.A. collided. One dived at Lt. Knight, who turned left handed. The H.A. zoomed right handed, and its left wing collided with the right wing of another H.A. which had started to dive on Lt. Knight. Bits were seen to fall off; only one H.A. was seen to go down, and it glided away east apparently under control, but was very shortly lost to sight as the de H's were too heavily engaged to watch it.⁸⁷

Surprisingly, the German fighters broke off the engagement and McKay and Knight were able to return to base. The damaged Albatros had been flown by Oswald Boelcke; it crashed behind German lines. Boelcke's death was an accident of war, coming at a moment when German aerial superiority could hardly have been more convincingly demonstrated.

By this time the Germans had also gone some way towards correcting the numerical imbalance which had existed for most of the Somme campaign, while the RFC was suffering from an apparent inability to concentrate its forces effectively. RFC strength on the Somme in October (including III Brigade) was 328 serviceable aeroplanes, as opposed to 333 with the German First Army. North of the Somme, the RFC on 22 October had 175 aeroplanes with I and II Brigades, and at least ninety more were with the RNAS at Dunkirk. In addition, there were a few Belgian air units north of II Brigade. Facing these allied aircraft were 101 machines with the GAF and a few others with Marine Korps units (under naval command). Similar disparities may be noted on the French front. With the German Second Army, facing the French Sixth Army, there were 207 aircraft and there were 244 more between this sector and the Swiss border. Opposed to them there were purportedly over 1400 French machines, although most were obsolescent. Despite being out-numbered by nearly three to one, the Germans enjoyed unchallenged air supremacy over a good part of the French-held front by late September. The RFC could look for no help from the French.⁸⁸

From early September General Haig and RFC Headquarters had begun to press the home authorities for reinforcements. In turn, the War Office applied pressure to the Admiralty despite the fact that fifty-six fighters had already been turned over by the RNAS to the RFC. On 18 September the Admiralty drew the line: '... having regard to the heavy demands which have been made on the Royal Naval Air Service for supplying machines to Russia and to the British Expeditionary Force in France, they regret that it is not possible at the present time to supply the machines asked for.' What the Admiralty neglected to mention was the fact that 3 (Naval) Wing at Luxeuil, already possessing fifty aircraft, was to be expanded to two hundred by the spring of 1917. Moreover, the War Office was not only aware of, but also objected to, the direct negotiations between the Admiralty and French military authorities which had created the Luxeuil establishment.⁸⁹ The RFC's reinforcement crisis, and the navy's intransigence, had already caused Sir David Henderson to write with unwonted bitterness to Haig: 'I have put forward the request to the Admiralty very reluctantly, for throughout the whole war we have never got much value out of any attempt at securing their co-operation, and sometimes the attempts have had only unpleasant and useless results. If the Admiralty comply with this request I fear you may be sorry afterwards. You had some experi-

ence of the Naval Air Service at the beginning of the war, and take it all round, I do not think it has improved much since then.'⁹⁰ At an earlier stage Trenchard as well as Henderson had been reluctant to accept RNAS squadrons, fearing that he might not have proper control of them and that their provision might prevent the acquisition of new RFC squadrons. Naturally, Admiralty concerns paralleled those of Trenchard: they feared loss of control over their units, a possible threat to their long-range bombing plans, and, more particularly, the hampering of Vice-Admiral Bacon's operations at Dunkirk.⁹¹

That good machines were available from Dunkirk was known to the Air Board, possibly through Commodore Sueter. Haig took up the cause with the Chief of the Imperial General Staff, Sir William Robertson, warning that unless a dramatic expansion in RFC strength took place shortly the aerial situation might be completely out of hand by the spring. Thereafter matters moved quickly. Trenchard shortly heard directly from Wing Captain Lambe, commanding RNAS forces at Dunkirk, that he and Rear-Admiral Vaughan-Lee were planning the transfer of a complete unit to the RFC. The loan of a squadron from Dunkirk 'as a temporary measure' was approved by the War Committee on 18 October; three days later the War Office informed Haig that 8 (Naval) Squadron was to be sent to Trenchard. By a process of compromise and persistence airmen in both flying services had contrived to overcome service shibboleths and to make possible the concentration of previously unavailable forces. One outcome of their efforts was the Admiralty's authorization for Lambe to co-operate directly with Trenchard.⁹²

Naval Eight came into existence on 26 October and on 3 November began operations from Vert Galand, attached to V Brigade. The pilots in this squadron were selected for their experience in fighter aircraft and six were Canadians. One of them, Flight Sub-Lieutenant D.M.B. Galbraith, was the first in the squadron to be credited with a victory, which took place on 10 November. Of the six, four had attended the Curtiss School in Toronto. Galbraith was one of that remarkable group to come out of Carleton Place, the small Ontario town that sent so many of its sons to fly in the European war. He had already won the Distinguished Service Cross and was to win further decorations before his combat career was over. At the end of the war he was credited with fourteen victories. Flight Sub-Lieutenant E.R. Grange of Toronto was also to win the DSC before being wounded in January 1917 and Flight Sub-Lieutenant G.E. Harvey of Edmonton gained the same decoration the following year. Other Canadian members of Naval Eight were Flight Sub-Lieutenants A.H.S. Lawson of Little Current, Ont., G. Thom of Merritt, BC, and S.V. Trapp of New Westminster, BC. Between 9 November and 26 December these Canadians were involved in about twenty combats. All but two of them were carried out in Sopwith Pups, a fine fighter with an operational ceiling of close to 18,000 feet and a low wing loading that made it highly manoeuvrable even at great heights.^{*93}

* The Pup got its name when General Brancker first saw it alongside the large 1½ Strutter. 'That they had come from the same stable was obvious. "Good God!" said Brancker, "Your 1½ Strutter has had a pup!" And Pup it was ever after, capturing the affection of all who flew it with flying qualities of such exceptional standard that fighter pilots ... recollected it as "The perfect flying machine" ...' But the Pups had some teething problems, the most serious of which was

The RFC had also acquired two other fighter squadrons in late October, 45 Squadron with Sopwith 1½ Strutters and 41 Squadron with FE8s. But GHQ continued to demand further reinforcement. As Haig wrote on 16 November, '... in order to get information and to allow artillery machines to carry on their work, it is becoming more and more necessary for the fighting squadrons to be in strength in the air the whole day.' When in June Haig had forecast RFC requirements, he had asked for twenty-three corps squadrons, twenty-four fighter squadrons (four with each army and four with GHQ), and nine reconnaissance squadrons (one for each army and four with GHQ). In November there were nineteen corps squadrons, thirteen army squadrons, and four GHQ squadrons in the order of battle, a short-fall of twenty. Now Haig asked for yet another twenty fighter squadrons.⁹⁴

Fighter operations had become the crucial role of air forces, for without the local air superiority granted by successful fighter actions the essential work of the corps squadrons could not be carried out. The Somme had taught this lesson both to the RFC and the GAF; moreover, both high commands had come to realize the vital importance of the air weapon to the ground battle. The immense casualties to both sides that were suffered in the ground battle overshadowed the air operations. Yet miniscule though they were in comparison to the vast losses of the armies, the wastage rate of the RFC was at least as great as that of the ground forces.

Corps squadrons suffered less than army and headquarters squadrons, another way of saying that despite mounting German opposition RFC fighter squadrons were doing their job. Most RFC casualties from June to December occurred over the Somme battlefield. There were 583 casualties in all; of these sixty-five are known to have been Canadian (32 killed, 21 wounded, and 12 captured). Only a third of the Canadian casualties were members of corps squadron. Of the forty-four Canadian casualties in army and headquarters squadrons, 75 per cent occurred over the Somme battlefield. For Canadians, the worst single week was that of 20 to 27 October, when six Canadians (only one with a corps squadron) were killed.⁹⁵

Between June and December at least 240 Canadians flew at the front, though at the end of the year there were probably no more than 130 remaining in front-line squadrons. In the coming year their ranks were greatly to be swelled, both from the RNAS and by new products from the RFC training schools, especially RFC Canada. The situation facing these fresh arrivals was to be very different from the predominance the RFC obtained in the opening weeks of the Somme offensive. Not until the last stages of the war were the British again to establish a comparable ascendancy; 1917 was to be a year of bitter struggle in the air waged by greatly expanding air forces in which the Germans yielded only slowly and grudgingly the margin of superiority they had so convincingly seized by the end of 1916.

described by E.R. Grange. When closing upon an adversary it was necessary to throttle down to prevent over-shooting, but this slowed down the rate of fire. The solution eventually arrived at was to place a double cam on the gun, making it fire twice for every rotation of the propellor. Harald Penrose, *British Aviation: the Great War and Armistice 1915-1919* (London 1969), 112; 'Notes by Sub Lieutenant Grange,' Air 1/73/15/9/158

Stalemate on the Western Front, 1917

In allied planning for the renewal of the offensive on the Western Front in 1917 *Général* Robert Nivelle was the key figure. His effective use of artillery to achieve deep penetration in counter-attacks at Verdun had vaulted him into the command formerly held by Joffre. In his spring offensive Nivelle proposed to make his main thrust on the Aisne River using all available French resources and spoke of breaking the enemy front within forty-eight hours. This blow was to be preceded by a diversionary attack astride the Scarpe River by the British Third Army, which would link up later with the French in the region of Cambrai. North of the Scarpe the Canadian Corps, part of the British First Army, was to seize Vimy Ridge.

There were, however, conflicting portents. Before the attack began on 9 April revolution in Russia and the declared belligerency of the United States had altered the strategic balance in as yet incalculable ways. More immediately, Nivelle declined to heed warnings by Major-General Trenchard, and probably du Peuty as well, that he could not count on air superiority as had been provided at the Somme. Nevertheless, despite requests that he delay his plans or at least limit his objectives, Nivelle's confidence, which had mesmerized the politicians, remained unshaken; the offensive would destroy the German armies and bring an early end to the war.¹

Nivelle's plan was based on concentrating artillery in overwhelming force. The French were in the process of doubling their ordnance production. In the British Expeditionary Force the number of heavy guns and howitzers, generally those above 4.5-inch calibre, had grown from 761 in July 1916 to 1157 in November and was expected to double again by the end of March.² With these means at his disposal Nivelle's tactical approach set the allied offensive pattern for operations during the first half of 1917, including the forthcoming battles of Arras and Vimy, the Second Battle of the Aisne and Messines. It laid a great responsibility on the air arm; as the Somme had shown, the effective use of heavy artillery concentrations was largely dependent upon airborne target spotting and fire control. Successful artillery co-operation required command of the air.

Control of the air was equally important to the Germans. Retaining the superiority which they had established by the end of the Somme campaign in order to curtail the effectiveness of observation aircraft was a major factor in the enemy's plan for countering allied artillery. In addition, the Germans abandoned the policy

of desperately defending every foot of ground. Rather, front-line positions were thinned out and the defence was based on strong reserve forces ready to counter-attack when allied formations had outdistanced the support provided by the main body of their artillery.³

The new system of defence was implemented as part of a larger plan which provided for withdrawal in March 1917 to the heavily defended Hindenburg Line, some twenty miles east of the old Somme front. The shortened line eliminated two large salients, one between Arras and Bapaume, the other between Peronne and Soissons. The position was hinged on Vimy Ridge, the great bastion north of Arras which linked the Hindenburg Line to the defences in Belgium and barred the approach of the Allies to the industrial centres of Lens and Lille. The withdrawal inevitably had an adverse effect upon German morale, but militarily it undercut the strategic justification for Nivelle's offensive at one stroke.

Allied air operations during Operation *Alberich*, the German withdrawal to the Hindenburg Line, were not notably effective either in providing useful intelligence or in disrupting the enemy's plans. In October 1916 reconnaissance aircraft of the Royal Flying Corps had reported that new trenches were being dug far behind the front lines but bad weather which prevailed throughout much of the winter hampered efforts to obtain more certain intelligence. Not until late February was the shape of the new line apparent. Even then, however, the Allies found it difficult to accept that the Germans would voluntarily abandon any of their hard-won territory. On 4 March, when the withdrawal was well under way, Lieutenant-Colonel C.L.N. Newall, commanding 9 (HQ) Wing, was ordered to reconnoitre the new German line and obtain air photos 'if possible.' That same day 18 Squadron, from v Brigade,* successfully photographed suspected lines in German rear areas and two days later six Sopwiths of 9 Wing's 70 Squadron† also obtained photographs. Other flights followed, although casualties were heavy. On 14 March the full German intentions were revealed when their detailed plans for the withdrawal and rearguard defences were found in a captured dug-out. Four days later a general advance began and six allied armies closed up to the shrinking German front.⁴

Throughout this period British commanders gave only part of their attention to the German withdrawal; their prime concern was their own offensive, scheduled to begin on 9 April. The concentration of the air arm for the assault, in fact, took place while the Germans were withdrawing, and it presented certain difficulties. By early 1917 the Germans had formed 37 *Jagdstaffeln*, equipped with Albatros D-Is and IIs, Rolands and Halberstadts which had proven so effective in late 1916, and also with Albatros D-IIIs. The latter preserved the best characteristics of the earlier designs and, in addition, borrowing deliberately from the Nieuport 17, had a new wing and strut configuration which much improved visibility from the cockpit.

* Canadians with 18 Squadron at this time included J.T. Anglin of Toronto (WIA 28 April 1917), J.F. Ferguson of Regina (WIA 26 Feb. 1917), V.H. Huston and W.F. Lees, both of Vancouver, W.F. MacDonald of Crooked River, Sask. (KIA 23 May 1917), E.G. Rowley of Guelph, Ont. (KIA 6 July 1917), J.R. Smith, address unknown (WIA 29 April 1917), and M.T. Trotter of Montreal (WIA 1 June 1917).

† Although more than one hundred Canadians served with 70 Squadron in the course of the war, only one, Captain G.C. Easton of Galt, Ont., was with the squadron at this time.

These 'veestrutters,' as British pilots termed them, now appeared in increasing numbers and were to take a heavy toll of allied aircraft during the first part of the year. Many of Richthofen's victories during this period were won while flying his red Albatros D-III.⁵

At the turn of the year the RFC had thirty-nine squadrons available for operations on the Western Front, but only twelve were classed as suitable for escort work, offensive patrols, and general air combat. Only five of these, equipped with Nieuport 17s and Sopwith Pups, were capable of meeting the German *Jastas* on anything like even terms. Trenchard had been promised eleven additional fighter squadrons by March, but as of 10 February none had arrived. On learning from Sir David Henderson that he could expect no more than two by the scheduled date, he wrote to General L.E. Kiggell, Haig's Chief of Staff, explaining once more the gravity of the situation: 'There is no possibility of improving matters before operations are likely to commence, and, in view of the hostile aerial activity now being disclosed, our fighting machines will almost certainly be inferior in number and quite certainly in performance to those of the enemy. The success of our aerial offensive will consequently be very seriously jeopardized, and we cannot therefore hope that our Corps machines will be able to accomplish their work as successfully or with as few casualties as during the battle of the SOMME.'⁶

The one bright spot in the supply problem was the assistance provided by the Royal Naval Air Service. By the end of 1916 the Board of Admiralty had formally approved Trenchard's request for four additional naval squadrons on the Western Front. He already had 8 (Naval) at his disposal, and the others arrived at intervals between February and May. Three of the squadrons, Nos 1, 8, and 10, were equipped with Sopwith Triplanes. The triplane structure gave the pilot a wide field of vision, an exceptional rate of climb, and an extremely manoeuvrable aircraft, capable of attaining a speed of 117 mph. Unfortunately for the RFC the Triplane was flown operationally only by the RNAS.*⁷

It was through the naval squadrons that Canadians made some of their most significant contributions in the spring offensive. Pride of service made the naval authorities anxious for their squadrons 'to put up a good show with the RFC.' One outstanding example was 3 (Naval), commanded by Squadron Commander R.H. Mulock of Winnipeg and equipped with Sopwith Pups. During the heavy fighting in March and April it was one of the few allied squadrons which gave out more punishment than it received. Its success was attributable in large measure to Mulock's ability as a leader and organizer and his extensive knowledge of aeroplanes and engines.

To a greater degree than most squadron commanders Mulock made each of his flight commanders responsible for keeping his flight in fighting trim. His administrative methods were directly related to operational requirements because the flight of five or six aircraft remained the tactical air unit, each patrol being carried out by a flight or section of a flight. One naval officer, attached to the RFC in

* The Fokker Dr-1 was the German response to the Sopwith Triplane. It was powered by a French-designed Le Rhône rotary engine, obtained from a Swedish firm which had built them under license. An extremely agile aircraft, the Dr-1 did not appear on the Western Front until August; its most famous pilots were Richthofen and Werner Voss. It remained in service until mid-1918.

France to monitor the performance of the naval squadrons, reported to his headquarters at Dunkirk that Mulock's 'is the best organized and the best run of any Squadron I have seen down here (including R.F.C. Squadrons).'⁸ On his suggestion a study was made of Mulock's methods, and when the squadron returned to the RNAS in June 1917 after four-and-one-half months of service with the RFC, he commended Mulock on its good record: 'Your men have done invaluable work, overcoming all difficulties, and have maintained Machines, Engines, Guns and Transport in a very high state of efficiency, and it is largely due to their self sacrifice and hard work that the pilots have been able to gain their undoubted supremacy in the air.'⁹ Trenchard, too, expressed his appreciation:

They [Naval Three] joined us at the beginning of February at a time when aerial activity was becoming great and were forced to work at full pressure right up to June 14th. when they left us.

Eighty enemy aircraft were accounted for* which, with only a loss of nine machines missing, alone shews the efficiency of the Squadron as a fighting unit.

The escorts provided by the squadron to the photographic reconnaissance and bomb raids enabled our machines to carry out these tasks unmolested.

The supremacy in the air which they undoubtedly gained, is largely due to the manner in which the machines, engines, guns and transport have been looked after by the Flight Commander[s], Flying Officers and Mechanics.

The work of Squadron Commander Mulock is worthy of the highest praise; his knowledge of machines and engines and the way in which he handled his officers and men is very largely responsible for the great success and durability of the Squadron.¹⁰

On 1 February, when Naval Three joined 22 (Army) Wing of v Brigade, half of its twelve pilots were Canadians and three more arrived later that month. Besides Mulock the six originals included Flight Sub-Lieutenants R. Collishaw of Nanaimo, BC, P.G. McNeil and A.T. Whealy, both of Toronto, J.P. White of Winnipeg, and Flight Lieutenant H.R. Wambolt of Dartmouth, NS. Collishaw was the most experienced fighter pilot of this group. The three who followed them, Flight Sub-Lieutenants F.C. Armstrong of Toronto, J.S.T. Fall of Hillbank, BC, and Flight Lieutenant J.J. Malone of Regina, were all decorated for service with the squadron during the following months. Fall and Armstrong received the DSC and Malone, who was killed in April, was posthumously gazetted a DSO. Another notable group arrived in March, including Flight Sub-Lieutenant L.S. Breadner of Carleton Place,[†] who succeeded to command of one of the three flights a month later.¹¹

* The claim of eighty enemy aircraft being accounted for by the Squadron may be taken as an instance of the general tendency to exaggerate enemy losses. Naval Three was credited with twenty aircraft destroyed and twenty-four damaged in RFC communiqués during the period under review, but even these figures are questionable in the light of admitted German losses.

† Subsequently Air Chief Marshal and Chief of Staff of the RCAF in 1940-3. In addition to those mentioned above, Canadians known to have flown with 3 (Naval) Squadron in the February to June period include R.F.P. Abbott of Carleton Place, Ont. (WIA 17 Aug. 1917), M. Allan, address unknown (KIA 6 July 1917), G.B. Anderson of Ottawa, A.R. Brown of Carleton Place, Ont., A.W. Carter of Calgary (WIA 17 June 1918), J.B. Daniell of Prince George, BC (POW 12

More Canadians came in with the other RNAS and RFC squadron reinforcements to supplement those already at the front. Twenty were flying with the seven squadrons of 9 (HQ) Wing at the beginning of April, and three times that number served during the month with III Brigade, half of them with corps and half with army squadrons. In I Brigade, on the left of the Vimy-Arras front, many Canadians flew with 2 and 16 Squadrons, both equipped with BE2s and the only corps units directly involved in the Vimy area.* In the fighter squadrons of I Brigade, Naval Eight had several Canadians and so did 40 Squadron flying Nieuport 17s.† The other army units, 25 and 43 Squadrons, flying FE2bs and Sopwith 1½

May 1917), J.A. Glen of Enderby, BC, (WIA 18 April 1918), N.D. Hall of Victoria (POW 3 Sept. 1917), G.S. Harrower of Montreal (WIA 23 Sept. 1917), H.M. Ireland of Toronto, H.S. Kerby (WIA 20 Nov. 1915) and L.L. Lindsay, both of Calgary, H.S. Murton of Toronto (POW 5 May 1917), W.E. Orchard of St Lambert, Que. (KIA 2 June 1917), A.M. Shook of Tioga, Ont. (WIA 16 May 1916, 21 Oct. 1917), and W.R. Walker of West Kildonan, Man. (POW 11 Dec. 1917). No 6 (Naval) Squadron, which arrived six weeks after No 3 (Naval), was also heavily Canadian. Its members in this period included C.L. Bailing of Toronto, P.E. Beasley of Victoria, R.E. Carroll, W.A. Curtis, and G.C.W. Dingwall, all of Toronto, S.T. Edwards of Carleton Place, Ont., J.H. Forman of Kirkfield, Ont. (WIA 28 July 1917, POW 4 Sept. 1918), O.J. Gagnier of Montreal (WIA 11 May 1917), G.A. Gooderham, M.R. Kingsford, and G.D. Kirkpatrick, all of Toronto, D.H. Masson of Ottawa (KIA 20 April 1917), G.G. McLennan of Eugenia, Ont. (KIA 20 July 1917), R.F. Redpath of Montreal, R.K. Slater of Ottawa (POW 5 April 1917), G.L.E. Stevens of Peterborough, Ont., and A. McB. Walton of Toronto.

* Because of the heavy casualties in this period a large number of Canadians passed through several of these squadrons. This was especially the case with 16 Squadron. Canadians who served in it during the January-June period included Major E.O. McMurtry of Montreal, a 1914 RMC graduate who won his rank in the 24th Battalion, CEF, transferred to the RFC on 1 January 1917, and was killed in action on 28 April 1917. Others were E. Alder, address unknown (WIA 12 May 1917), F.H. Baguley of Toronto, F.L. Baker of Vancouver (WIA 2 July 1917), J.S. Black of Regina (KIA 28 April 1917), J.W. Boyd of Toronto (KIA 5 Feb. 1917), G.J.O. Brichta of North Battleford, Sask. (KIA 6 March 1917), W.A. Campbell of Vancouver (KIA 26 April 1917), K.P. Ewart, address unknown (KIA 4 Jan. 1918), A.E. Hahn of Tavistock, Ont., O.R. Knight, address unknown (KIA 6 April 1917), R.H. Lloyd of Wingham, Ont. (WIA 28 March 1917), H.D. Mason of Canton, Ont. (KIA 28 April 1917), D.A. McDougall and W.E. McKissock (KIA 1 June 1917), both of Toronto, D.J. McRae of Ste Anne de Prescott, Ont. (KIA 1 Feb. 1917), C.N. Milligan of Victoria (WIA 21 April 1917), F.E. Neily of Esquimalt, BC (KIA 27 Dec. 1917), J.F. Proctor of Calgary, R. Ritchie of Maisonneuve, Que., G.R. Rogers of Kingston, Ont. (KIA 21 April 1917), U.H. Seguin of Ottawa (KIA 6 April 1917), A.E. Watts of Fort Frances, Ont. (KIA 6 March 1917), H.W. Wheatley of Montreal, and A. Willans of Ottawa (WIA 6 Oct. 1917). No 2 Squadron included H.J. Bennett of Pembroke, Ont. (POW 24 Sept. 1918), F.E. Brown of Quebec City, G.B. Davies of Medicine Hat, Alta, W.P. Eastwood of Peterborough, Ont., F.C. Higgins of Sherbrooke, Que., R.H. Kelly of Toronto, F.A. Looseley of Hamilton, Ont., M.W. Richardson of Durham, Ont., A.S.H. Ryding of Toronto (WIA 7 April 1918), F.B. Scullard of Chatham, Ont., N.E. Wallace (WIA 19 Sept. 1917), and R.V. Waters, addresses unknown.

† No 40 Squadron included C.L. Bath of Toronto (WIA 3 November 1917), J. Gagne of Ottawa (KIA 24 May 1917), A.E. Godfrey of Vancouver, H.A. Kennedy of Hamilton, Ont. (KIA 22 Aug. 1917), H.S. Pell of Toronto (KIA 6 April 1917), A.B. Raymond of Nanaimo, BC (POW 13 May 1917), F.W. Rook of Toronto (KIA 21 July 1917), and G.C.O. Osborne of Arnprior, Ont. Canadians with 8 (Naval) from 28 March, the date it arrived on the Western Front, to the end of June included A.E. Cuzner of Ottawa (KIA 29 April 1917), C.B. de T. Drummond of Montreal, A.R. Knight of Collingwood, Ont., J.N. McAllister of St Andrews, Man., S.H. McCrudden of Toronto (WIA 5 Sept. 1917), Roderick McDonald of James River Station, NS (KIA 8 May 1918), E.D. Roach of Toronto (KIA 1 May 1917), J.A. Shaw of Edmonton, and D.M. Shields of Mount Albert, Ont. (WIA 1 May 1917, June 1917).

Strutters, respectively, were responsible for long-distance reconnaissance, bombing, and line patrols.*¹²

The air plan for the spring attack was based, as always, on the offensive doctrine which Trenchard had adopted from the moment that he first took command, and to which he adamantly adhered throughout his three-year tenure as commander of the RFC in the field. Air superiority was to be obtained by carrying the fight to the Germans over their own territory. This offensive pressure, it was assumed, would enable 'our Corps machines to cooperate with the artillery and infantry during the ground operations with as little interference as possible from the enemy.' Trenchard expected his fighter pilots to penetrate well behind the lines 'seeking out and fighting the enemy over his own aerodromes.'¹³ 'The aim of our offensive,' he stressed to his brigades, 'will therefore be to force the enemy to fight well behind, and not on, the lines. This aim will only be successfully achieved if offensive patrols are pushed well out to the limits of Army reconnaissance areas, and the G.O.C. looks to Brigadiers to carry out this policy and not to give way to requests for the close protection of corps machines except in special cases when such machines are proceeding on work at an abnormal distance over the lines. The aerial ascendancy which was gained by our pilots and observers on the SOMME last year was a direct result of the policy outlined above, and with the considerable addition to our strength provided by the new type fighting squadrons now available the G.O.C. feels confident that a similar ascendancy will be gained this year.'¹⁴

Within these general directives, on 4 April, five days before the Canadian Corps went into action at Vimy Ridge and the Third British Army began its drive along the Scarpe River, the RFC launched an all-out air offensive, attacking enemy observation balloons, bombing rail centres and aerodromes, and carrying the fighting deep into enemy territory. In order to seal off the battle area and allow the artillery aircraft to operate with as much freedom as possible, a large quadrilateral-shaped intercept zone extending about fifteen miles into enemy territory was

* The squadron commander of 25 Squadron during this period was Major C.S. Duffus of Halifax. Other Canadians with it during the first half of the year included D.L. Burgess of Ottawa, H. Cotton of Paris, Ont. (POW 28 May 1917), H. St G.S. de Carteret of Halifax, J. Gagne of Ottawa (KIA 24 May 1917), D.E. Holmes of Wingham, Ont., V. McL. Howard and S.A. Hustwit, both of Toronto, J.H. Kirk of Sussex, NB, N.L. Knight, address unknown (KIA 28 March 1917), R.R. Laing of Westmount, Que., C.T. Lally of Wainwright, Alta (WIA 18 Dec. 1917), D. Leishman of Westmount, Que. (WIA 7 May 1917), R.G. Malcolm of Grimsby, Ont., W.D. Matheson of New Glasgow, NS (WIA 16 March 1917), A.H.K. McCallum of Victoria (POW 8 April 1917), P.L. McGavin of Toronto (KIA 14 Aug. 1917), W.M. Munro, address unknown, L.F. Williams of Fort Frances, Ont., and C.M. Wilson of Vancouver (KIA 14 Oct. 1918). Also with the squadron was J.F.W. Blackall of St John's, Nfld (POW 21 May 1917). With 43 Squadron were W.G. Bell of Toronto, H. Burnett, address unknown, F.S. Coghill of Stratford, Ont. (POW 25 July 1918), H. St G.S. de Carteret of Halifax, J.L. Dickson of Burgessville, Ont. (WIA 7 May 1917), G.C. Dixon of Vancouver (WIA 16 Sept. 1918), J. Gagne of Ottawa (KIA 24 May 1917), F.C. Gorrington of Prince Albert, Sask., L.H. Gould of Winnipeg (KIA 15 Oct. 1917), J.B.B. Harvey of London, Ont. (POW 9 May 1917), R.T.C. Hoidge and E.H. Jones (WIA 24 May 1917), both of Toronto, H.S. Lewis of Orangeville, Ont. (WIA 6 April 1918, POW 10 April 1918), M.J. Morris of Ottawa (KIA 3 May 1917), S.J. Pepler of Toronto (KIA 6 March 1917), A.E. Pickering of Grandview, Man., W.H. Schoenberger of Toronto, D.R. Smith of Sherbrooke, Que., J.D. Stuart of Vancouver (WIA and POW 6 March 1917), and C.P. Thornton of Moose Jaw, Sask. (POW 4 April 1917).

B.E.F. OPERATIONS 1917

THE BATTLE OF ARRAS

a	Vimy Ridge	9 - 14 Apr
b	First Scarpe	9 - 14 Apr
c	Second Scarpe	23 - 24 Apr
d	Attack on (La Coulotte)	23 Apr
e	Arleux	28 - 29 Apr
f	Third Scarpe	3 - 4 May
g	Bullecourt	3 - 17 May
h	BATTLE OF MESSINES	7 - 14 Jun
j	BATTLE OF HILL 70	15 - 25 Aug

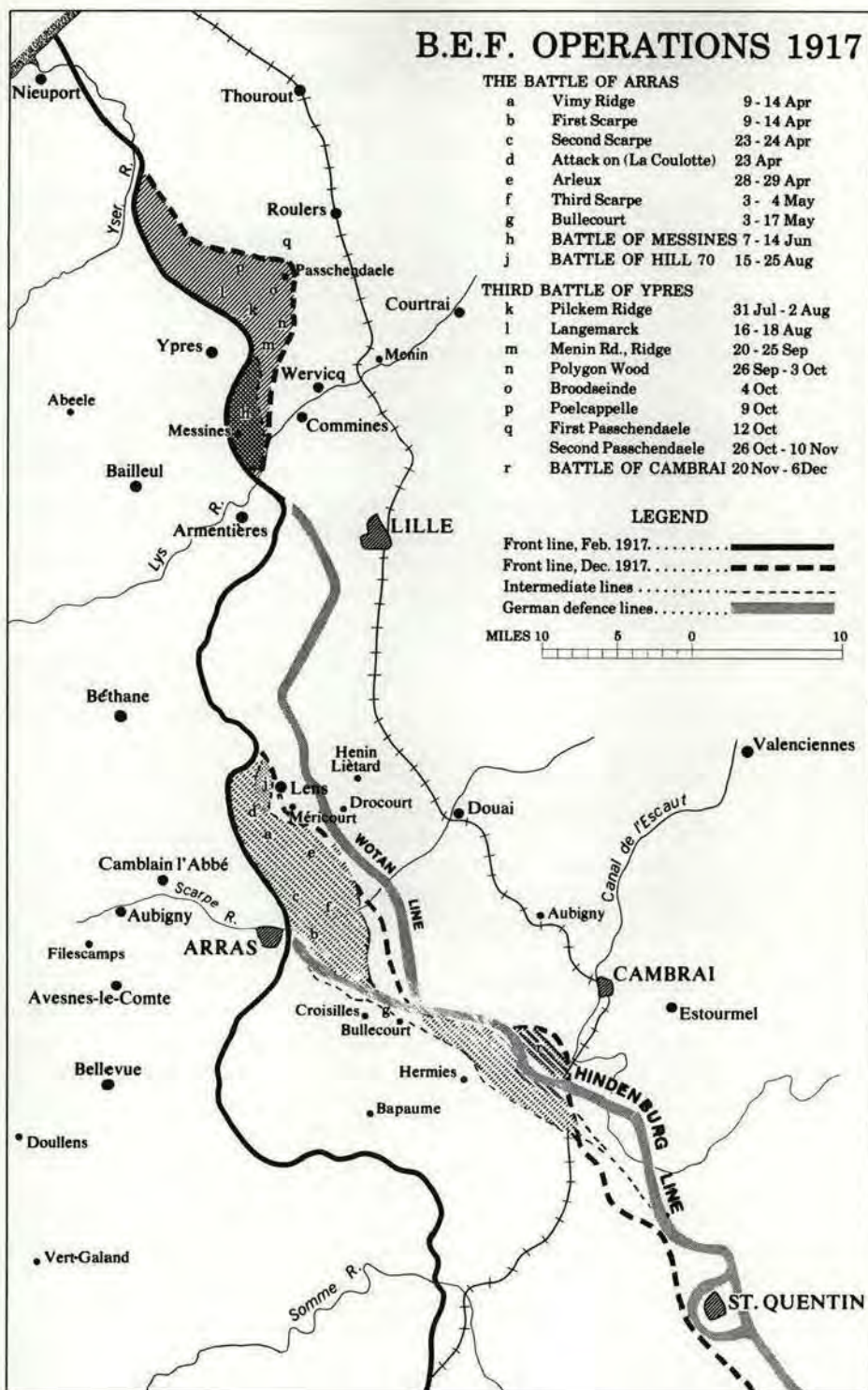
THIRD BATTLE OF YPRES

k	Pilckem Ridge	31 Jul - 2 Aug
l	Langemarck	16 - 18 Aug
m	Menin Rd., Ridge	20 - 25 Sep
n	Polygon Wood	26 Sep - 3 Oct
o	Broodseinde	4 Oct
p	Poelcappelle	9 Oct
q	First Passchendaele	12 Oct
	Second Passchendaele	26 Oct - 10 Nov
r	BATTLE OF CAMBRAI	20 Nov - 6 Dec

LEGEND

Front line, Feb. 1917.
Front line, Dec. 1917.	-----
Intermediate lines
German defence lines.

MILES 10 5 0 10



established. It was bounded on the west by a line running from Lens to Bullecourt, approximately twenty miles, and on the east from Henin-Liétard to Sains. At times there were as many as fifty single-seater fighters patrolling this area seeking to bring the enemy to combat, while half as many two-seaters, principally 1½ Strutters and FE2bs, patrolled defensively closer to the battle line to protect the artillery aircraft.*¹⁵

The Germans, however, found it relatively easy to penetrate the air screen. Although they also stressed the offensive, they were selective in their application of it. The chief task of the German fighters was to destroy allied artillery and reconnaissance aircraft and bombers which crossed the lines. As a rule they attacked allied fighter patrols only when the situation was particularly favourable and seldom did they carry the fight across the line. Taking advantage of cloud cover and aided by ground observation centres which determined the best time to bring the fighters into action, small enemy formations, usually two or three fighters, slipped past the allied patrols and attacked the vulnerable artillery aircraft. So while allied offensive patrols could count on a scrap only when they were escorting bombers and reconnaissance machines, the corps two-seaters felt the full weight of the German fighters. On the Vimy front in April, of thirty-eight aircraft known to be missing, wrecked on landing after combat, or returned with wounded airmen, thirty-five were two-seaters while only three were single-seater fighters.¹⁶

A factor which contributed to the heavy losses suffered by RFC corps aircraft during 'Bloody April' was the coming into service of a new machine, the RE8, designed to replace the BE2s. As early as the end of 1915 it had been recognized that the BE2c was obsolete (although seventeen squadrons were still equipped with the machine in January 1917), and RFC Headquarters had asked for a new reconnaissance and artillery aircraft that could defend itself. The RE8 was the Royal Aircraft Factory's answer. During tests in 1916 the aircraft acquired an evil reputation which never quite deserted it. The gas tanks were directly behind the engine; if a crash occurred, fuel from the tanks burst into flame on contact with the hot engine. The fuselage had a peculiar upward tilt, intended to increase the angle of attack of the wings on landing. The consequent braking effect made the aircraft at home in small fields. Many pilots, however, failed to adapt to the aircraft's strange attitude, and crashes from overshooting were frequent. Finally, the RE8 was far too stable (a characteristic of Royal Aircraft Factory designs) and it proved an easy target for the fast German fighters. By the beginning of April three corps squadrons had been furnished with the RE8. On 13 April one of them, 59 Squadron, lost six of these unwieldy aircraft and ten pilots and observers killed in a few minutes to a patrol led by Richthofen.^{†17}

* The map in H.A. Jones, *The War in the Air: being the Story of the Part played in the Great War by the Royal Air Force*, III (London 1931), facing 330, shows the offensive patrol area as being further east than it actually was, but this may represent the patrol area before the land offensive began.

† Only one of the casualties was a Canadian, Lieutenant W.J. Chalk, address unknown, a recent transfer from the CEF. Other Canadians with 59 Squadron during the early months of 1917 included J.W.G. Clark and R.M. Grant (WIA 8 April 1917), both of Toronto, B. Harvey, address unknown, E.O. Houghton of Ingersoll, Ont., J.F. MacKinnon of Victoria (WIA 24 Sept. 1916,

Of the ground operations fought on the British front in April and known collectively as the Battles of Arras, the Canadian Corps' attack on Vimy Ridge was the only one entirely successful. The ridge, rising gently to a height of over two hundred feet above the Douai plain, had been one of the dominating features of the northern sector of the Western Front for more than two years. The Germans had taken possession of it in October 1914 and since then had worked continuously at fortifying it. On the forward slope a system of trenches with inter-connecting tunnels and deep dug-outs barred the way. On the other side of the crest, visible in most places only from the air, a second network of trenches had been constructed. Fortunately for the Canadians, however, plans to introduce the principle of defence in depth were not carried out. The bulk of the defending troops were in the front trench system with orders to hold their ground at all costs. The immediate purpose of the assault on the ridge was to form a defensive flank for the advance of the Third Army along the Scarpe and to deprive the enemy of observation into the valleys running southwest. A secondary purpose, arising from plans for a northern offensive to be undertaken later in the year, was to secure a commanding view of the plains to the north and east and thus threaten the German hold on the Belgian coast.¹⁸

The Vimy offensive was marked by careful planning, meticulous preparation, and effective air-artillery co-operation. The artillery plan was carried out in two phases – a preliminary bombardment which began on a limited scale twenty days before the attack and gradually increased in weight, with an intense barrage supporting the assault itself. Prior to this much aerial photography had been completed, information obtained, and damage done to trench systems and hostile batteries. By early March air photos of the entire German defence system formed the basis of a new map which was continually brought up to date as enemy dispositions changed. Of 212 hostile batteries deployed on Vimy Ridge and beyond, over 180 were accurately located and plotted by aerial photography and other means.¹⁹

The most effective work of 16 Squadron, supporting the Canadian Corps, was accomplished during the preparatory period, bad weather restricting flying during the actual assault. Based at Bruay about six miles behind the front and making use of a forward landing field close by the Corps Headquarters at Camblain l'Abbé, the squadron was organized in three flights of eight aircraft each.* Two flights were assigned to counter-battery work and one to trench bombardment.²⁰

Each flight of BE2s worked with a particular artillery group and also carried out photographic reconnaissance of its own area up to four thousand yards beyond the front-line trenches, where the FE2bs of 25 Squadron took over. Neutralizing fire, intended to silence enemy guns temporarily, was conducted through RFC wireless

MIA 28 Nov. 1917), G. Maddock, address unknown, T.W. McConkey of Bradford, Ont. (WIA 11 May 1917), F.D. Pemberton of Victoria (WIA 11 May 1917, KIA 21 Aug. 1917), J.M. Souter of Hamilton, Ont. (KIA 11 April 1917), R.S. Stone, address unknown (WIA 24 April 1917), L.A. Wheatly of Winnipeg (KIA 2 July 1917), and B.A. Wilson of Fernie, BC (WIA 7 May 1917).

* An increase in establishment from eighteen to twenty-four aircraft in corps squadrons had been sanctioned by the War Office, but because of shortages the only squadrons with twenty-four aircraft were No 16 of I Brigade, and Nos 8, 12, and 13 of III Brigade. All reverted to eighteen aircraft by June. Jones, *War in the Air*, III, 313–14; IV (London 1934), 111n

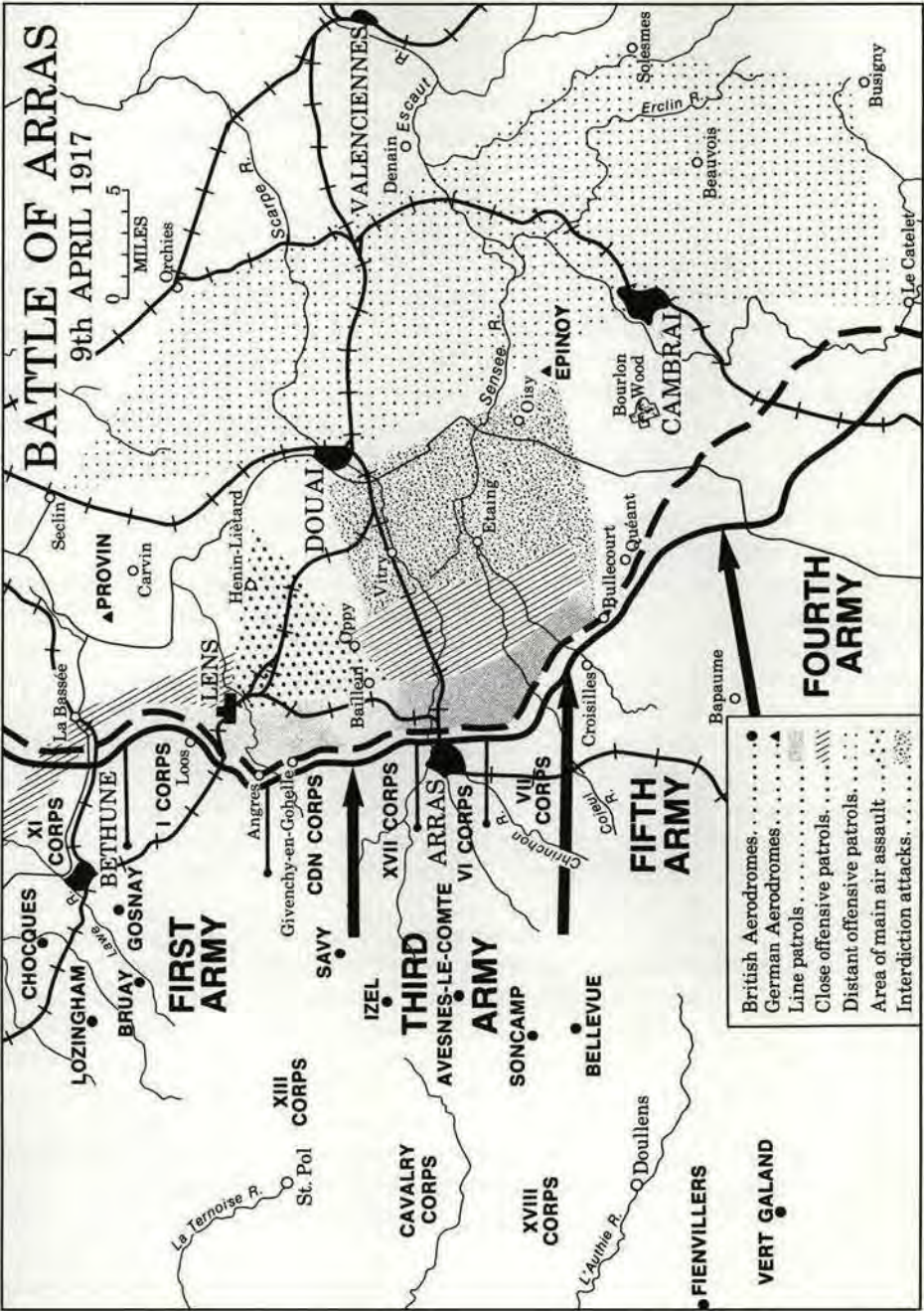
stations at battery positions, and through an advanced central wireless station which monitored and assisted calls for fire and provided communication between the aircraft and the Canadian Counter Battery Office. Tasks were prepared, targets identified, batteries assigned, and observation schedules issued by Canadian Corps Heavy Artillery. Before and after each shoot aerial photos were taken from which damage assessments could be made and plans adjusted accordingly. A proficient observer was expected to control two shoots simultaneously and complete four during a regular two-hour flight.²¹

The air battle of Vimy Ridge started long before the ground fighting began. Left relatively unprotected by the application of Trenchardian doctrine, 16 Squadron's BE2s were no match for the marauding German fighters. Four Canadians were killed and one wounded during February and March. On 1 February Lieutenant D.J. McRae of St Anne de Prescott was operating a camera when he and his pilot were surprised by Richthofen, who had made Vimy Ridge one of his favourite hunting areas. Twin Spandaus poured a hail of bullets into the aircraft, sending it down into the German trenches near Thélus within view of the troops of the 3rd Canadian Division. The pilot and observer both died from their wounds. Lieutenant P.B. Boyd of Toronto, who was wounded on 4 February and died the next day, and Second Lieutenant A.E. Watts of Fort Frances, Ont., and Lieutenant J.G.O. Brichta of North Battleford, Sask., both killed on 6 March, were the other Canadian fatalities. Lieutenant R.H. Lloyd of Wingham, Ont., was wounded on 28 March. In return, Second Lieutenant F.H. Baguley of Toronto had the satisfaction of sending a Halberstadt down out of control on 6 March; five days later the observer of Lieutenant F.L. Baker damaged and drove off another machine of the same type.²²

The pressure on 16 Squadron became so great that on 19 March III and V Brigades were ordered to help I Brigade by maintaining offensive patrols in the neighbourhood of Douai, the home of *Jasta 11* and the source of much of 16 Squadron's grief. This added measure of protection may have brought some relief because in the first week of April only two of their machines were lost.* The enemy remained active, however. After a lull from 17 to 20 April caused by bad weather, air fighting was again severe until the end of the month. The Germans concentrated so effectively on the corps machines that, despite Trenchard's explicit instructions, offensive patrols were forced in closer to the lines to provide direct protection for the artillery aircraft. Nevertheless, the BEs continued to fall. On I Brigade front between 20 and 30 April eight were reported missing, five of them from 16 Squadron, four were wrecked on landing after being damaged in combat, two returned with wounded observers, and in another the pilot was fatally wounded. In all, six Canadians were missing and one wounded in this climactic ending to 'Bloody April'.²³

Much of the air fighting took place within full view of the front-line troops and the war diaries of various units of the Canadian Corps contain a number of eye-

* One of them was flown by Second Lieutenant O.R. Knight, address unknown, formerly with the CEF, with Second Lieutenant U.H. Seguin of Ottawa as observer. I Brigade work summary, April 1917, Air 1/768/204/4/252



witness accounts. Understandably, artillery units were most interested in the air battle: 'Situation very quiet with the exception of air activity, several air fights took place, one enemy and one British plane came down,' the diary of a field artillery formation recorded on 7 March 1917. On 12 March another entry noted that 'Two of our planes brought down and one hostile plane.'²⁴ The diarist of the 2nd Canadian Divisional Artillery commented that 'enemy machines seem considerably superior to our own': 'For the past three weeks enemy planes have had the best of every encounter on our front, & there have been many. The German fast red plane can make circles round our slow F.E. patrol & artillery machines, many of which have been shot down. Our new Sopwith triplanes seem to be useful.'²⁵ Two observation aircraft came down in flames in front of the 3rd Canadian Siege Battery on 6 April, provoking the comment: 'A great many of our observing planes have been lost during the past few weeks and it is a wonder to us that some steps are not taken to give them proper protection.' Still, the enemy did not always dominate the action. An entry for 3 April in the diary of the 2nd Brigade, Canadian Field Artillery, located near Neuville St Waast, recorded that during the day 'Our aeroplanes were very active as many as 35 being counted at one time, while enemy planes were not in evidence.'²⁶

The danger of being hit by artillery shells was another hazard that the corps squadron crews faced. Major E.O. McMurtry of Montreal and his observer, Lieutenant H.D. Mason of Canton, Ont., were both killed when their BE2 was apparently struck by an artillery shell.²⁷ Fighter pilots, especially on low-flying missions, also ran the risk of being blown out of the air in this way. In his 1918 book, *Winged Warfare*, W.A. Bishop related: 'Over and over again one felt a sudden jerk under a wing-tip, and the machine would heave quickly. This meant a shell had passed within a few feet of you. As the battle went on the work grew more terrifying, because reports came in that several of our machines had been hit by shells in flight and brought down ... Yet the risk was one we could not avoid; we had to endure it with the best spirit possible.'²⁸

The high toll among two-seaters brought into question the efficacy of Trenchard's offensive policy. Corps and divisional commanders, the primary users of the vulnerable corps aircraft, began to press for protective fighter escorts. Their requests, however, were quashed with the support of General Kiggell, Haig's Chief of Staff, who circulated a statement of air policy stressing once more the importance of keeping the offensive patrols well beyond the enemy lines and pointing out the folly of weakening the fighter force by using it in a defensive role. Kiggell's directive, expressing Trenchard's views, claimed that 'since our aerial offensive commenced early this month, the losses among fighting machines has been more than five times as many as among Corps machines, and the work of the latter has been very little interfered with.'²⁹ While this statement may have been true for the RFC as a whole, it did not fit the situation in I Brigade. The brigade's loss ratio in April was about one army to two corps aircraft. Eight Canadians were reported killed or missing in corps aircraft as compared with three in fighter and fighter-reconnaissance planes.

South of Vimy in the valley of the Scarpe where the objective of the Third British Army was to drive through to Cambrai and link up with the French forces,

more decisive clashes between the rival fighter arms took place. Here the ratio of casualties between co-operation and fighter aircraft was closer to that claimed by General Kiggell. Of the sixty Canadians flying with III Brigade in support of the Third Army, nine were killed, five wounded, and one captured during April. Five of those killed, the prisoner of war, and two of the wounded were members of fighter squadrons.³⁰

Three of the Canadian casualties were members of 60 Squadron, whose record exemplifies the struggle of the fighter squadrons in 'Bloody April.' Its pilots patrolled an area east of Arras, from the slopes of Vimy to Fampoux. This sector was also frequented by Richthofen and clashes between Nieuport and Albatros were frequent. The squadron had its first serious setback on 7 April when three Nieuports were shot down in an encounter with *Jagdstaffel 11*. One of those killed was Second Lieutenant C.S. Hall, address unknown, who had been with the squadron since 6 January. Major J.A. Milot of Joliette, Que., was killed the next day and on the weekend of 14–16 April the squadron lost ten Nieuports out of an establishment of eighteen, including that of Lieutenant J. McC. Elliott of Winnipeg who was wounded on 16 April.^{*31}

It was during this dark period, one of the most critical that the RFC was to undergo during the war, that W.A. 'Billy' Bishop emerged as 60 Squadron's foremost fighter pilot, beginning a career that was to make him one of the most famous airmen of his generation. Of that extraordinary group of Canadian fighter pilots of the First World War – Collishaw, Bishop, MacLaren, Barker, McKeever, Claxton, to name the most prominent – it was Bishop more than any other who caught the public eye. More has been written of him than of any other airman in Canada's history. A decidedly erratic RMC cadet, he left the college to join the Mississauga Horse when war broke out and went overseas in 1915 with the 7th Canadian Mounted Rifles. In September of that year, when his unit crossed to France, Bishop was left behind; he had transferred to the RFC, where he was training with 21 Squadron as an observer. After a brief period on the Western Front with that squadron in early 1916 he underwent pilot training in England. In March 1917 he reported to 60 Squadron at Izel-le-Hameau. By that time, according to his logbook, he had a total of seventy-five hours, and experience on BE2s, BE12s, Avro 504s, and Sopwith Pups.³²

No 60 Squadron, however, flew Nieuports, and Bishop, a better fighter than he was a pilot, had trouble adjusting to this sensitive aircraft. On 11 March he began practice flying; over the next two weeks he and the groundcrew endured burst tires, strained airframes, and at least one crash-landing. A less discerning squadron commander might well have returned Bishop to the pilot's pool before he had had an opportunity to show what he could do. But Major A.J.L. Scott, one of the RFC's most perceptive leaders, recognized that the ham-fisted young Canadian flew with

* Canadians flying with 60 Squadron in the first half of 1917, in addition to those mentioned above, included W.A. Bishop of Owen Sound, Ont., G.D. Hunter of St Mary's, Ont. (POW 6 May 1917), C.W. McKissock of Toronto (POW 6 May 1917), R.U. Phalen of Lockeport, NS (KIA 28 May 1917), W.J. Rutherford of Westmount, Que., F.O. Soden, born in New Brunswick, E.J.D. Townesend of Cowichan, BC (POW 31 March 1917), and G.C.O. Usborne of Arnprior, Ont.

the calculating aggressiveness that marked the great fighter pilots. After five hours of practice flying in France, he flew his first operational patrol on 17 March. On 25 March he shot down his first enemy aircraft, an Albatros, while flying as rear man in a formation of four Nieuports. The combat began at 9000 feet near Arras and demonstrated that, whatever Bishop's weaknesses as a pilot, he was a first-class shot with the true killer instinct:

While on D[efensive] P[atrol] 3 Albatros Scouts approached us. One, separating from the rest, lost height and attempted to come up behind our second to the rear machine. I dived and fired about 12 to 15 rounds. Tracers went all around his machine. He dived steeply for about 600 ft. and flattened out. I followed him and opened fire from 40 to 50 yards range. A group of tracers went into the fuselage and centre section, one being seen to enter immediately behind the pilot's seat and one seemed to hit the pilot himself. The machine then fell out of control in a spinning nose dive. I dived after him, firing. I reached 1500 or 2000 ft. My engine had oiled up and I glided just over the line ... The Albatros Scout when last seen by me was going vertically downwards at a height of 500 to 600 ft. ...³³

On 30 March Scott demonstrated his prescience by sending the still inexperienced Bishop out as the leader of a five-man offensive patrol. Within a month of his first operational flight Bishop had become the squadron's 'ace,' and Scott was permitting him to fly roving missions by himself in addition to his normal patrol duties.

Like all the great air fighters, Bishop was an expert deflection shot, a skill he maintained by constant practice. His tactics, a subject to which he gave much thought, were built around surprise, which he regarded as the essence of air fighting. In part, his methods were forced upon him because the Nieuport was much slower than the best German fighters; even so, his combat reports from this period show that, once surprise was lost, he was usually willing to break off combat. When that was not possible, his heavy-handedness became a positive advantage in the rough-and-tumble of air combat. He threw the little Nieuport about with complete abandon and a rare tactical sense. As his letters home reveal, he was also driven by an intense urge to win recognition. His personal and family correspondence contains many accounts of his victories, as well as references to his 'score,' his decorations, and the number of victories registered by RFC and French rivals. Joined to his skill and drive was a relentless courage that impelled him constantly to seek combat. On 30 April, for example, in a space of two hours before noon, he reported eight distinct combats against a total of nineteen aircraft. As Scott noted at the bottom of his report: 'Comment, I think, is unnecessary.'³⁴

Naval Three also acquitted itself exceptionally during the April battles, its Pups usually getting the better of the Halberstadt and Albatros scouts. It was employed principally on escort duty providing protection for BE2s used as bombers. The nature of this work was almost bound to bring on an encounter with the German air force, yet only three of the Pups were lost during the month of April. The squadron had one of its busiest days on 11 April while escorting a formation of BE2s on a bombing raid on Cambrai. L.S. Breadner destroyed one Albatros in the air, forced another out of the fight, and sent an unidentified enemy machine down in flames. J.S.T. Fall scored three remarkable victories for which he was awarded the DSC. He attacked and destroyed one enemy aircraft; he was driven

down toward the ground by hostile scouts, but manoeuvred onto one of them from behind and saw his tracers go into the pilot's head; later he brought down another enemy who attacked him. He returned with his own aircraft riddled with bullet holes.³⁵

Two weeks later Breadner, described by one of his acquaintances as a 'fire-eater',³⁶ brought down an enemy aircraft not far from his own aerodrome at Marieux and within an hour or so was back in his room telling about the adventure in a letter to Canada: 'I was going down to the aerodrome when I heard the anti-aircraft guns going. On looking up I saw a Hun directly over-head at about 10,000 ft. So I scrambled into my "bus" & after him. He was at 12,000 ft. when I got up to him (a great big double-engined pusher type machine) so I sat right behind his tail where he couldn't shoot at me. I fired 190 rounds at him & shot both his engines.'³⁷

The German aircraft crashed on the allied side of the lines and Breadner landed in a field close by. He was unable to converse with the occupants of the downed machine, a pilot and two observers who were captured by some 'Tommies,' since they spoke no English. Their aircraft was still burning, but before it was destroyed Breadner cut away the cross insignia, boasting that 'We have it in the mess now.' The letter ended with a hurried notation: 'I'll have to close now as we are going out on a "Big Stunt" in a few minutes & I have to put my kit on yet.' Breadner then led his flight of five Pups in escorting a formation of six FE2bs en route to bomb Epinoy aerodrome. Soon after crossing the line they were met by two formations of enemy fighters. After making sure that the bombers were back over the British lines the escort turned on their pursuers. J.J. Malone attacked one enemy plane, shooting the pilot, drove down a second, and went after a third. Flight Sub-Lieutenant G.B. Anderson of Ottawa sent another German down out of control. The skirmish attracted other machines from both sides and a free-wheeling battle developed and spread over a large area. During the engagement Malone ran out of ammunition, flew to a nearby aerodrome, reloaded, returned to the fight, and drove down another hostile aircraft. Malone was reported missing the following week. At that time he was credited with seven downed enemy aircraft and was posthumously gazetted for the DSO for his victories.³⁸

In April, reflecting the intensity of the fighting, casualties reached an all time high in the RFC. In the four-week period ending 27 April 238 personnel were reported missing or killed and 105 wounded. Known Canadian casualties for the month totalled twenty-six killed, thirteen wounded, and six missing. German losses from 31 March to 11 May were thirty-three killed, sixteen missing, and nineteen wounded. Thirty German aircraft were destroyed in the same period, compared with 122 RFC machines, but the RFC was continually operating over enemy territory and its pilots were much more vulnerable than their German adversaries, who were seldom far from the safety of their own aerodromes.³⁹

A classic illustration of this is provided by a letter written by Lieutenant T.W. McConkey of Bradford, Ont., the observer in an RE8 of 59 Squadron engaged on routine corps reconnaissance duties on 11 May. It describes how he won the MC

* Presumably the enemy machine was either a Friedrichshafen G-III or a Gotha G-IV or V. All of these bombers were in service at that time.

'... while photographing about 9000 yards into Hunland. We were attacked by five Albatross scouts which broke up our formation. Between us we shot down two of the enemy and drove another down, apparently out of control. My pilot, Captain Pemberton from B.C., manoeuvred the machine in a most excellent fashion, evading the fire of Huns as much as possible and giving me every opportunity to bring my Lewis gun into play. He received a spent bullet in the back, necessitating his spending a week in the casualty clearing station. I came off less fortunately, with four bullet wounds in the right thigh, one in shoulder and one in face ...'⁴⁰

The bloody operations about Arras, which had originally been intended as diversionary attacks to draw off German reserves from Nivelle's offensive on the Aisne, were prolonged into May because of the collapse of the French assault after the first few days. The French debacle was compounded by widespread mutiny among the troops. Nivelle was replaced by *Général* Henri Pétain, and the new commander-in-chief was compelled to adopt a defensive stance for the rest of the year, while the morale of his shattered forces was rebuilt. As a result, the major responsibility for offensive action on the Western Front passed to the British, with predictable consequences for the focus of the air war.

Plans for an assault on the Messines-Wytschaete Ridge, which commanded the British position on the right flank of the Ypres Salient, had been included in the original offensive plans for 1917. Its seizure was necessary for a successful offensive in Flanders to free the Belgian coastal region, a course urged by the Lords of the Admiralty who wanted the ports of Ostend and Zeebrugge. But it was to be undertaken only on the condition that Nivelle's master plan failed to achieve a decisive breakthrough. The British, Nivelle had agreed, would then be free to break off the fighting east of Arras and attack in Belgium with the Second British Army supported by the Belgian army and the French forces at Nieuport. Consequently, with the French halted on the Aisne and Pétain asking for time to restore the confidence of his demoralized troops, Haig decided to implement the plans for a British offensive in the north. The first move was to be against the Messines Ridge, 'whose capture would deprive the Germans of valuable observation points and form a solid right flank for the advance into the coastal region.

The offensive was mounted by the Second British Army and its air arm, II Brigade, which was significantly reinforced for the operation. Two corps squadrons of RE8s and BE2es were added along with two army squadrons, 1 and 10 (Naval) with their Sopwith Triplanes. In addition, 23 (Spad) and 40 (Nieuport) Squadrons of I Brigade were detailed to extend their offensive patrols to cover the II Brigade area, while the fighter, bomber, and reconnaissance squadrons of 9 (HQ) Wing were moved north at the end of May to the Second Army zone.* By the beginning of June Trenchard had concentrated twenty squadrons (half of them equipped

* Canadians serving in 23 Squadron in the first half of 1917 included W.R. Brookes of Jerseyville, Ont., Lloyd Elsley of Ridgeway, Ont. (KIA 5 April 1917), V.C. Gordon of Toronto, T.G. Holley of Winnipeg (POW 2 Feb. 1917), E.G. Joy of Toronto, K.C. McCallum of Vancouver (WIA 22 April 1917), G.I.D. Marks of Toronto, W.W. Stratton of Peterborough, Ont., and R.W. Young of Toronto. No 46 Squadron included F.B. Baragar of Elm Creek, Man. (WIA 3 Sept. 1917), N.S. Caudwell of Brantford, Ont. (WIA 25 May 1917), R.L.M. Ferrie of Hamilton (KIA 21 Jan. 1918), A.L. Fleming of Toronto, and A.R. Fortin of Winnipeg.

with single-seater fighters) mustering well over three hundred serviceable aircraft. German reinforcements for the entire Fourth Army front, from Messines to the sea, fell short of this number, and in the battle area further reinforcements did not arrive in time for the fight. Although a detailed German air order of battle has not been found, it seems likely that enemy aircraft on the Flanders Front were outnumbered two to one, and along the Messines Ridge by a much higher margin.⁴¹

Using its numerical advantage the RFC tried to seal off the battle area by a system of barrage patrols flown by the army squadrons along a line that corresponded approximately with the enemy's line of observation balloons, tethered about a mile behind his front line. This system had brought the Germans little success at Verdun in 1916, but the margin of numerical superiority held by the RFC enabled it to police the barrage line from dawn to dusk, with patrols maintained at two or more levels, and still form an outer screen of distant offensive patrols. The main task of the fighters on the barrage line was to protect the corps aircraft. They were also expected to prevent the enemy from using his own artillery co-operation machines and force him to haul down his observation balloons. Orders were issued that no German planes were to be permitted to cross the barrage line. Some of course did. But it is remarkable, in view of what had happened in April, and a measure of the air superiority established in the battle area, that between 31 May, when the main bombardment began, and 6 June only one corps machine was lost. This was an RE8 of 42 Squadron carrying Second Lieutenant C.J. Baylis of Victoria as observer. He was killed.⁴²

The fighter patrols were supplemented by the compass stations installed in each army area late in 1916. These were located at widely separated points, and by obtaining cross-bearings on the wireless transmissions of an enemy artillery-ranging aircraft they could trace its movements with a fair degree of accuracy. By the spring of 1917 the system was in full operation with all the compass stations linked in a single network. When an enemy aircraft was located in this way its position was relayed to the appropriate army wing headquarters and from there by telephone to a squadron or flight on standby for such emergencies.⁴³ The response bears close resemblance to the fighter 'scrambles' of the Second World War. The procedure followed in 60 Squadron was probably typical of the RFC as a whole: '... in order efficiently to answer the compass calls, as they were termed, three or four pilots always had to be standing by to leap into their machines and be off the ground, in formation, inside of two minutes. Nevertheless, they became extraordinarily smart at this manoeuvre, and answered to the [Klaxon] hunting horn – doubled blasts of which were the signal at that time – as keenly as a fashionable pack of foxhounds.'⁴⁴ In the first week of June the army wing headquarters of II Brigade received forty-seven calls from the wireless interception centre at Messines. The net result was one enemy aircraft destroyed, seven estimated to be damaged, and twenty-two enemy artillery shoots abruptly terminated.⁴⁵

* Jones, *War in the Air*, IV, 119, states that until 7 June no artillery planes were shot down. Since the RE8 in which Baylis was flying was reported missing on the evening of 6 June, after the day's entry had been made in the Squadron Record Book, the casualty was counted as occurring on 7 June.

The Battle of Messines, like that at Vimy, was based on limited objectives, to be achieved by concentrating an overwhelming weight of artillery fire on a narrow front. The artillery bombardment and counter-battery programme began on 21 May and increased in intensity as the day of the attack, 7 June, approached. Within the security screen provided by the fighters and assisted by good weather the artillery flights were able to direct the British guns on to enemy positions on the far side of the ridge with devastating effect. When the ground attack went in almost a quarter of the German field artillery, and nearly half of their heavy artillery, had been knocked out. The assault itself was preceded by the detonation of nineteen mines, with over 450 tons of explosives, which had been placed under the German front lines more than six months before. Immediately after the mines were blown, at 0310 hrs, the whole of the artillery of the Second Army began to fire at the maximum rate. From the air the ground appeared to be 'bouncing up like the surface of water in a heavy storm.' Although there was stiff resistance in places, the infantry assault was successful, most of the assigned objectives being taken that same day.⁴⁶

Strong air support was one of the key factors in the victory. The fighter screen was so effective that Maurice Baring, Trenchard's personal aide and secretary, was moved to comment that 7 June was 'the finest day in the air we have ever had. Our people entirely prevented the Boche Flying Corps from working, and our artillery work in co-operation with aircraft went without a hitch.' Twenty-nine corps aircraft worked along the front of the three attacking corps, a distance of about 17,000 yards, almost doubling the highest density employed previously. No 6 Squadron attached to X Corps was the only corps unit to lose aircraft.* Two of its RE8s went missing and in other combats four members of the squadron were wounded. In 42 Squadron on the II Anzac Corps' front Lieutenant W.F. Anderson of Toronto, flying an RE8, was attacked by three fighters while on a photo mission, but his observer sent one of the attackers down in flames and damaged another.† Their aircraft 'was very badly shot about but neither was injured.' Apart from these incidents, the corps squadrons carried on without any interference, adjusting artillery fire on to 157 enemy batteries. Nos 1 and 41 Squadrons,‡ flying Nieuports

* Canadians with 6 Squadron during the first half of 1917 included C.A.S. Bean, address unknown (POW 9 Aug. 1917), C.N. Bennett of Halifax (KIA 25 June 1918), W.B. Ferguson of Ameliasburg, Ont. (KIA 7 July 1918), S.H. Glendinning of Sunderland, Ont. (KIA 17 July 1918), P.L. Goudie of Toronto (WIA 11 April 1917), M.O. Haskell of Lachine, Que., E.A. McKay of Toronto (POW 22 Aug. 1918), J. O'Rourke of Winnipeg, W.D. Thomson of Saskatoon, Sask. (KIA 5 Jan. 1917), R.J. Warner of Toronto, and A.L. Wilson of Vegreville, Alta.

† Canadians in addition to Anderson flying with 42 Squadron from January to June included C.J. Baylis of Victoria (KIA 6 June 1917), L.R. Brereton of Winnipeg (WIA 22 July 1918), G.T. Dracup of Yorkton, Sask. (KIA 28 July 1917), E. Hamilton of Princeton, BC (KIA 15 Feb. 1917), F.A.N. Haultain of Port Hope, Ont., H.L. Kennedy of Talbotville Royal, Ont., W.A. Landry of Dorchester, NB (WIA 15 Feb. 1917), H.A. Laws of Winnipeg, E.A. McKay of Toronto (POW 22 Aug. 1918), W.E.G. Murray of Vancouver (WIA four times: 7 June 1915, 26 Sept. 1916, July 1917, June 1918), B.H. Smith of Halifax (KIA 22 July 1917), and A.W. Waddy of Vancouver.

‡ Major G.C.St P. de Dombasle, formerly of the Royal Canadian Regiment, had been Officer Commanding 1 Squadron since late in 1916. Other Canadians with the unit in the first half of 1917 included G.H. Armstrong and G.C. Atkins (POW 19 June 1917), both of Toronto, E.S.T. Cole, address unknown, R.H. Cronyn of London, Ont., L. Drummond of Toronto (POW 18 May

and FE8s, respectively, were specifically assigned to provide close ground support over the battlefield while other fighter squadrons were given ground attack as a secondary role. Aerodromes and ground transport were the main targets, but they had a roving commission to strike at anything they saw 'in order to harass the enemy as much as possible and spoil the morale of his troops.'⁴⁷

During June ninety Canadians served with the squadrons of the reinforced II Brigade operating in support of the Messines attack, of whom ten were killed, six wounded, and three reported missing.^{*48} The most distinctively Canadian unit was 10 (Naval) in which thirteen of the squadron's fifteen pilots were Canadian when the unit joined II Brigade in mid-May.[†]

Naval Ten was formed at St Pol (Dunkirk) on 12 February and was shortly thereafter equipped with Sopwith Triplanes. Its original pilots were considered unready for action, however, so in the spring it was restaffed with seasoned veterans, almost all of whom were Canadians. Eight were posted in from Naval Three with the others coming from various sources. Collishaw, for instance, had recently

1917), S. McKercher of Wroxeter, Ont. (WIA 23 April 1917), F.M. McLaren, address unknown (KIA 12 Aug. 1917), and W.W. Rogers of Alberton, PEI. In 41 Squadron during the same period Canadians included W.I. Bailey of St Mary's, Ont. (WIA 8 June 1917), A.W. Hogg of Winnipeg (WIA 9 June 1917), R.H.B. Ker of Victoria, and H.E. Paquin of Montreal.

* Canadians in 20 Squadron from January to June included J.L. Boles of Ingersoll, Ont. (KIA 13 June 1918), F.H. Bronskill of Ottawa (POW 1 Feb. 1917), G.T.W. Burkett, address unknown, C.M. Carbert of Campbellville, Ont. (KIA 1 Feb. 1917), W.M.E. Chester of Toronto (WIA 13 July 1917), E.B. Cogswell of Ottawa (WIA 24 May 1917), W. Durrand of Edmonton, H.E. Hartney of Pakenham, Ont. (WIA 14 Feb. 1917), A.N. Jenks of Coaticook, Que., H.W. Joslyn of Sintaluta, Sask. (MIA 17 Aug. 1917), W.T. Jourdan of Vancouver (WIA 14 Feb. 1917), A.C. Lee of Stoney Creek, Ont. (POW 20 May 1917), W.R. Macaskill of Baddeck, NS (POW 19 June 1917), I.M. MacLean of North Sydney, NS (WIA 15 Aug. 1917), R. MacK. Madill of Beaverton, Ont. (KIA 21 July 1917), R.G. Masson of Ottawa (KIA 24 May 1917), H.R. Nicholson of Hamilton (KIA 24 April 1917), W.P. Scott of Toronto (WIA 28 May 1917), A.G. Stewart and S.F. Trotter (KIA 6 July 1917), addresses unknown, M.W. Waddington, R.W. White (POW 25 Jan. 1917), E.A. Wickson (KIA 16 June 1917), and H. Reid Wilkinson (POW 10 Sept. 1917), all of Toronto, and F.W. Wright of Tottenham, Ont. In 45 Squadron there were R.S. Bennie of Leamington, Ont. (MIA 5 June 1917), W. Birkett of Moose Jaw, Sask. (WIA 17 June 1917), G.W. Blaiklock of Montreal, C. St G. Campbell of Cobalt, Ont. (KIA 6 April 1917), E.F. Crossland of Toronto, J.B. Fotheringham of Ottawa (KIA 7 July 1917), F.G. Garratt of Montreal, J.E. MacKay of Toronto, T.A. Methal of Moose Jaw, Sask. (KIA 5 June 1917), J.F. Scott, address unknown, W.W. Shaver of Woodstock, Ont., F.C.H. Snyder of Kitchener, Ont. (MIA 7 July 1917), T.R. Sorton of Toronto, C.T.R. Ward of Lennoxville, Que., R.S. Watt of Langton, Ont. (KIA 12 June 1917), and W.T. Wood of Sackville, NB. No 70 Squadron included D.J. Allan of Killarney, Man. (WIA 15 June 1918), C.A.S. Bean, address unknown, A.S. Bourinot of Toronto (POW 3 June 1917), W.R. Cooke of Orillia, Ont. (WIA 13 Aug. 1917), J.G. Crang of Toronto, G.C. Easton of Galt, Ont., S.W. Graham of Toronto (WIA 6 June 1918), L.A. Kelwig, address unknown, L.H. Kennedy of Montreal, L.A. Kiburz of Vancouver, H.D. Layfield of Vancouver (WIA 21 Sept. 1917), S.L. Shannon of Prince Albert, Sask., J.A. Sully of Ottawa, and F. Tapping of Toronto. This squadron was commanded by Major A.W. Tedder, subsequently Marshal of the Royal Air Force.

† Aside from Collishaw, the other Canadians were W.M. Alexander and K.G. Boyd, both of Toronto, A.C. Disette of Vancouver (KIA 2 June 1917), J.H. Keens (WIA 7 June 1917), P.G. McNeil (KIA 3 June 1917), E.V. Reid (KIA 28 July 1917), and Q.S. Shirriff, all of Toronto, G.E. Nash of Stoney Creek, Ont. (POW 25 June 1917), J.A. Page of Brockville, Ont. (KIA 22 July 1917), L.H. Parker of Leeds Village, Que. (KIA 14 June 1917), C.E. Pattison of Winona, Ont. (WIA 20 May 1917), and J.E. Sharman of Oak Lake, Man. (KIA 22 July 1917).

returned from convalescent leave and was available for a new posting. As one of the most experienced pilots he assumed command of 'B' Flight* and took a leading part in preparing the unit for action. Collishaw remained with the squadron until the end of July and received a DSC and DSO for his service on the Ypres front.⁴⁹

The Canadian pilots soon established the squadron as one of the leading fighter units in II Brigade. In June its aircraft destroyed fifteen of the forty-six enemy machines claimed by II Brigade and twenty-seven of eighty-three others damaged or driven down out of control. Naval Ten's biggest day was 6 June when it claimed five destroyed and five others forced down. Collishaw, whose logbook records sixty missions that month, destroyed or sent down out of control thirteen enemy aircraft.⁵⁰ His combat report for 17 June describes one of these encounters:

Near Armentieres [sic] our patrol [six aircraft] met five Spads,[†] who accompanied us. Over Roulers, we saw and dived on eight enemy Scouts, followed by Spads. After diving on three different Scouts and missing them with my fire, I climbed away each time. I then saw an E.A. attacking one of the Spad machines and dived on him firing about 50 rounds, when the E.A. stalled and fell out of control.

I attacked another enemy Scout, which was attacking a Spad, but after 30 rounds my gun jammed and I could not clear it.

I saw Flt. Sub-Lt. Reid close one ... and fire into it. I was able to see the E.A. go down in a series of stalls and spins, and I am certain he was out of control beyond recovery.

I also saw another machine go down out of control after attack from a Spad.⁵¹

Notwithstanding the fact that they were rated as generally superior in performance to the Albatros and Halberstadt scouts, the Sopwith Triplanes by no means had it all their own way. Between 15 May and 30 June the squadron lost six of its Canadian members, three killed and three wounded or missing. In addition, at least two other members of the squadron were lost, one being killed and the other taken prisoner.⁵²

Although Messines was the main centre of air action in the latter part of May and early June, the most publicized event in the air war was the strafing of a German airfield on the Arras front by W.A. Bishop on 2 June. His action brought him a Victoria Cross, the tenth to be won by an airman and the first by a Canadian flyer. The attack had its origin in Bishop's brief association with Captain Albert Ball, recognized at the time as the most outstanding airman in the RFC. During a visit to 60 Squadron on 5 May Ball had invited Bishop to join him in a surprise raid on a German aerodrome with the object of destroying aircraft on the ground. There were obvious hazards, but the aggressive young Briton felt that surprise, in

* 'B' Flight was nick-named 'Black' Flight because the engine cowlings and top and side fuselage panels were painted black to enable the flight mechanics to recognize their own aircraft and go immediately to their assistance as they returned from patrol. 'A' and 'C' Flights used red and blue colour schemes respectively to identify their aircraft. Raymond Collishaw with R.V. Dodds, *Air Command: a Fighter Pilot's Story* (London 1973), 81

† There were no Spad squadrons in II Brigade and the five that joined Collishaw's patrol must have been from 23 Squadron of I Brigade or from a French squadron.

as much as a low-level attack on an aerodrome had never been attempted and would not be expected, would enable them to turn the trick. A few days later, before anything definite had been organized, Ball was killed in action. But the idea kept churning in Bishop's mind.

By the end of May, with the Arras front relatively quiet, 60 Squadron was mainly occupied with answering compass calls. Bishop disliked this exhausting and unrewarding type of work: there were frequent chases but few combats. Moreover, he found the sound of that 'damned Klaxon horn' used to alert the pilots was becoming 'hard on the nerves - and the legs.' It was in this mood that he determined to carry out the proposal which he and Ball had briefly discussed. He chose a free day, 2 June, for his self-assigned mission and took off before dawn in his Nieuport. At the aerodrome he attacked the Germans as they were getting ready for the day's work.⁵³ Always a key factor in his tactics, surprise worked for Bishop here as it did on so many other occasions. His combat report tells what happened during the few minutes he was over the enemy airfield:

I fired on 7 machines on the aerodrome, some of which had their engines running. One of them took off and I fired 15 rounds at him from close range 60 ft. up and he crashed. A second one taking off, I opened fire and fired 30 rounds at 150 yards range, he crashed into a tree. Two more were then taking off together. I climbed and engaged one at 1,000 ft., finishing my drum, and he crashed 300 yards from the aerodrome. I changed drums and climbed E[ast] a fourth H.A. came after me and I fired one whole drum into him. He flew away and I then flew 1,000 ft. under 4 scouts at 5,000 ft. for one mile and turned w. climbing. The aerodrome was armed with one or more machine guns. Machines on the ground were 6 scouts (Albatros Type I or II) and one two-seater.⁵⁴

A note appended to the combat report by the squadron commander observed that Bishop 'was several times at a height of 50 ft. over this enemy aerodrome* at least 17 miles East of the lines. His machine is full of holes caused by machine gun fire from the ground.' A fellow pilot remembered 'clearly seeing a group of about five bullet holes in the rear half of his tailplane, the elevator, within a circle of not more than six inches diameter at the most. Whatever machine was on his tail must have been very close indeed to achieve that group.'⁵⁵

Although an isolated event and really an episode in the private war which Bishop, like many another fighter pilot, carried on against the German air force, the action did have a wider significance. As the most daring and successful low-level attack yet carried out, it provided an example which was repeated during the Battle of Messines and later. Thus, the orders issued to 9 (HQ) Wing for 7 June included specific reference to low-flying attacks on aerodromes of a kind which had not been attempted before Bishop's exploit.⁵⁶ On the announcement of

* The location of the airfield Bishop attacked has never been definitively established. Arthur Bishop identified Estourmel as the airfield attacked, on the basis of his father's recollections and a study of the ground. William Arthur Bishop, *The Courage of the Early Morning: a Son's Biography of a Famous Father* (Toronto 1965), 100. The combat report gives the location as 'either Esnes Aerodrome or Awoingt,' but by Bishop's own admission he didn't know where he was. All three airfields were clustered within a few miles of each other southeast of Cambrai.

Bishop's having been awarded the Victoria Cross, more than two months later,* General Trenchard removed him from operational flying. He was not to return to the Western Front until 1918, when he came back as a squadron commander. Until he left for England in August, however, Bishop continued to take a prominent part in the air war, which now centred upon a major British offensive in Flanders.

Sir Douglas Haig had been favourable to the idea of a Flanders offensive since January 1916. It had been his alternative to operations on the Somme and now, with the clean, if very limited, success of Messines behind him, and the French incapable of mounting a significant attack, he was in a strong position to push for it as a better choice than the Italian offensive backed by the 'Easterners' on Lloyd George's newly-formed War Policy Committee. Strategic justification for the Flanders offensive was given to the committee in a week-long series of conferences attended by Haig starting 19 June. The demoralized French armies needed time to recover from the mutinies of the previous month; Admiral Sir John Jellicoe considered that unless the German submarine warfare campaign could be restricted by the capture of the Channel ports, Britain would have to end the war in 1918 because of shipping losses; any breakthrough in Flanders would threaten the main communication of the German armies there, which ran through bottlenecks north and south of the Ardennes; and if the enemy could be driven from the Belgian coast it would compel his heavy bombers to cross the BEF lines to carry out raids against London.⁵⁷

The War Policy Committee reluctantly accepted Haig's arguments although it still doubted the ability of the BEF to achieve such ambitious goals. Finally, on 16 July, a clear decision was reached 'to allow Haig to begin his offensive, but not to allow it to degenerate into a drawn out, indecisive battle of the "Somme" type.' The first phase of the ground offensive was to drive a wedge into the German defences around the Ypres Salient. From the expanded salient the British would then advance northeastwards, with their right on the high ground of the Passchendaele Ridge, to gain the Thourout-Couckelaere line on their way to Bruges.⁵⁸

Prior to the infantry assault, scheduled for 15 July, General Gough's Fifth Army would lay down a massive sixteen-day artillery bombardment. Since the main German defences lay along the crest and reverse slope of the low ridge which dominated the Ypres Salient, the British artillery – especially the heavy guns engaged in counter-battery work – were, as usual, heavily dependent on aerial observation for accurate ranging. This, together with the army's demands for photo-reconnaissance and protection against enemy air observation, required that the RFC establish and maintain aerial superiority for a considerable period. Thus the Third Battle of Ypres really began on 11 July with the opening of an RFC offensive designed to secure an aerial corridor over the front and to prevent the intrusion of enemy reconnaissance aircraft.⁵⁹

* 'This must surely be a very unusual case of a Victoria Cross or any high honour being awarded on the word of the recipient only as to his exploit and without any witnesses or participants. Our CO knew Bishop so well as to believe in him implicitly, as did the whole squadron and higher authority.' William Frye, *Air of Battle* (London 1974), 136

The artillery preparation ruled out the possibility of strategic surprise and the air build-up on both sides had become obvious several weeks earlier still. Between the middle of June and the end of July the Allies and the Germans had concentrated every available aircraft into the thirty-mile corridor between the Lys and the sea – the entire Belgian air force, forty strong, some two hundred French and over five hundred British machines (totalling 60 per cent of the RFC in France and half of them single-seater fighters), facing about six hundred Germans. Many famous squadrons were gathered there, including the French 'Les Cigognes,' the American 'Lafayette Escadrille,' the RFC's 56 and 60 Squadrons,* and the RNAS' Naval Ten.^{†60}

The German force included *Jagdgeschwader 1 – Jastas 4, 6, 10, and 11* under the overall command of Germany's top-scoring pilot, Manfred von Richthofen, who had already been credited with fifty-six victories when his 'Circus' was formed on 23 June. But the Allies had a clear-cut numerical advantage and they added to it an advantage in morale on 6 July when, in a dogfight between the 'Circus' and six FE2ds of 20 Squadron[‡] and four Sopwith Triplanes of Naval Ten, Richthofen was shot down by an FE observer, temporarily blinded and paralyzed by a bullet which creased his skull. The enemy's premier fighter ace was thus removed from the battle for six weeks.

By the opening of the offensive the technological superiority so decidedly in the Germans' favour earlier in the year had evaporated. Three new British aircraft were responsible. The first was the Bristol F2A, or Bristol Fighter, a large, powerful, and fast two-seater, designed as a fighter-reconnaissance machine and commonly called the 'Brisfit.' Its first employment on operations, by 48 Squadron on 5 April,[§]

* No 56 Squadron spent fourteen days in England during this period, as a home defence squadron against German day bombers. It returned to France on 5 July, two days before the second Gotha daylight raid on London. Jones, *War in the Air*, IV, 134–5, 152; V, 36. Canadian airmen serving in 56 Squadron in summer 1917 included V.P. Cronyn of London, Ont., C.B. Fisher of Lindsay, Ont., R.T.C. Hoidge and R.G. Jardine (KIA 20 July 1917), both of Toronto, I.C. MacGregor of New Glasgow, NS (WIA 9 Aug. 1917, 21 Sept. 1917), and L.J. Williams of Vancouver. No 60 Squadron had three Canadian flight commanders: Bishop, W.J. Rutherford of Westmount, Que., and F.O. Soden, born in New Brunswick.

† Seven of those who had been with Naval Ten when it joined II Brigade in mid-May – Collishaw, Alexander, Boyd, Reid, Shirriff, Page, and Sharman – were still with it. Canadians who had joined it since then included A.W. Carter of Calgary (WIA 7 June 1918), C.B. de T. Drummond of Montreal, H.J. Emery of Edmonton, T.L. Glasgow of Toronto (KIA 19 Aug. 1917), N.D. Hall of Victoria (POW 3 Sept. 1917), T.B. Holmes and T.C. May (KIA 24 July 1917), both of Toronto, H.B. Mound of Winnipeg (WIA 28 May 1918), G.L. Trapp of New Westminster, BC (KIA 12 Nov. 1917), and C.H. Weir of Medicine Hat, Alta (KIA 21 Aug. 1917).

‡ Canadians flying with 20 Squadron in July 1917 included J.L. Boles of Ingersoll, Ont. (KIA 13 June 1918), C.H. Cameron of Victoria, W.M.E. Chester of Toronto (WIA 13 July 1917), W. Durrand of Edmonton, A.N. Jenks of Coaticook, Que., H.W. Joslyn of Sintaluta, Sask. (MIA 17 Aug. 1917), I.M. MacLean of North Sydney, NS (WIA 15 Aug. 1917), R. MacK. Madill of Beaverton, Ont. (KIA 21 July 1917), S.F. Trotter, address unknown (killed in this fight), M.W. Waddington of Toronto, and F.W. Wright of Tottenham, Ont.

§ Canadians flying with 48 Squadron when it acquired Bristol F2As included W.G. Bell of Toronto, W.J. Clifford of Hamilton (KIA 25 April 1917), H.St G.S. de Carteret of Halifax, Robert Dodds of Hamilton, J. MacL. Hutcheson, address unknown, H.P. Lale of Calgary, F.M. Magenais of Lachine, Que. (WIA 11 May 1917), N.C. Millman and L.E. Porter (WIA 23 April 1917), both of Toronto, W.L. Rutledge of Fort William, Ont., A.C. Simpson of Montreal, and J.W. Warren, address unknown.

was an unqualified disaster, four of a flight of six being shot down by Richthofen and his companions. Richthofen judged the machine as 'quick and rather handy, with a powerful motor,' but considered the Albatros D-III 'undoubtedly superior.' Yet within a few weeks the Brisfit had emerged as a most formidable and versatile aircraft. Its most notable pilot was Lieutenant A.E. McKeever of Listowel, Ont., who demonstrated that the best use of the machine was to fly it as if it were a single-seat fighter, instead of using it in the standard two-seater fashion as a firing platform for the observer. McKeever was thus able to exploit fully the Bristol's flying qualities and the firepower of its fixed, forward-firing Vickers, while his observer was left to cover the tail with a Lewis gun on a flexible ring mounting.⁶¹

The second new aircraft, beset with engine problems, also had an inauspicious debut in April. The SE5 and its subsequent modification, the splendid SE5a with a 200-hp Hispano-Suiza engine, were among the fastest fighters manufactured during the war, showing top speeds in the 120–130 mph range during 1917 tests. The aircraft was the first British two-gun single-seater fighter, having a Lewis gun mounted on the top plane and a Vickers synchronized to fire through the airscrew.⁶²

Finally, in July, some RFC and RNAS squadrons began to re-equip with the Sopwith Camel, a stubby little machine that was to become the most famous of all British fighters. The Camel did not have the speed of the SE5a, but the concentration of weight in the forward section of its short fuselage and the pronounced torque of its engine, which made it unstable and somewhat hazardous to fly, also meant that in the right hands it had a quite startling agility. The Camel mounted a pair of belt-fed Vickers firing through the propeller arc, giving it even greater firepower than the SE5. In 1917 the Germans had no real answer to these aircraft, the Albatros D-V and D-Va, introduced in mid-summer, not being appreciably better than the D-III.⁶³

Tactically, however, the Germans continued to hold the edge. Their *Geschwadern* – Richthofen's Circus was the first of them – were self-contained fighter wings which could be deployed on any part of the front to establish local air superiority, then moved again as the tactical situation demanded. This concept was well ahead of current British tactics. While the RFC was only now enlarging its basic tactical formation from three- to five-machine flights and was endeavouring to maintain such a continuous offensive strategy that 'along the whole stretch of the British Front there were seldom more than 25 fighting aircraft in the air together,' the Germans usually chose to mass one or more fighter wings at times and places of their own choosing and then make sudden sweeps over the line. Casualties were

* As well as engine problems, the SE5 had initial difficulties with the synchronizing gear. In a letter home on 22 July W.A. Bishop wrote: 'Yesterday we did our first jobs on S.E. 5s and my gun was the only one that fired. It shot holes through my propellor.' Nevertheless, the strength, speed, and firepower of the aircraft was ideally suited to Bishop's heavy-handed flying and his tactical approach; he himself soon termed the SE5 'the best machine in the world.' In a period from 28 July to 16 August, when he was taken off operations, Bishop and his SE5 were credited with bringing down eleven aircraft, nine of them Albatros fighters. This brought his score to forty-seven. See Bishop biographical file, DHist.

heavy in the sparse and outnumbered British fighter patrols and even heavier among the relatively unprotected artillery and reconnaissance machines. 'If not before, Webb-Bowen [commanding V Brigade, RFC] ought to have changed his policy of withholding escorts at the beginning of July 1917,' recalled one former British pilot, 'when the new *Jagdgeschwader* moved north ... and British squadrons ... faced a much greater concentration of German fighters than before.'⁶⁴

On 7 July, for example, a formation of six Sopwith 1½ Strutters of 45 Squadron, returning from a photo-reconnaissance mission to Wervicq, was attacked by eighteen or more Albatros scouts from the *Richthofengeschwader*. Two of the Sopwiths fell in flames, carrying with them their pilots and two Canadian observers, Lieutenants J.B. Fotheringham of Ottawa and F.C.H. Snyder of Kitchener, Ont. On this occasion Lieutenant C.T.R. Ward of Lennoxville, Que., flying as observer in the formation commander's machine, was able to bring back twenty-one exposed plates, but fifteen days later another formation of eight aircraft from the same squadron, sent to photograph Menin, was much less successful. Attacked by the Circus before it reached the objective, the formation was quickly broken up, three of its aircraft shot down, and the remainder driven back without any photographs. It was small consolation that a Canadian crew, piloted by Lieutenant E.F. Crossland of Toronto with G.W. Blaiklock of Montreal as observer, claimed one enemy machine driven down out of control.⁶⁵

Meanwhile, the fighter squadrons which might have been protecting these obsolescent fighter-reconnaissance machines or defending their ground forces against enemy bombing raids[†] were dissipating their strength flying distant offensive patrols far over the enemy lines. Arthur Gould Lee, then a junior pilot of 46 Squadron,[‡] later an RAF air vice-marshal, has eloquently recorded the fighter pilot's disillusion with this interpretation of the offensive spirit:

The futility of such wasteful losses was the deeper because if a D[istant] O[ffensive] P[atrol] were weak in numbers ... it could easily be overwhelmed, but if the patrol were strong, the Germans could, and frequently did, ignore it, leaving us with a debit of forced-landed aeroplanes, wasted engine hours and wasted petrol.

Had there been a specific object in our deep penetrations, such as covering a bombing raid or a photographic reconnaissance, we would have thought nothing of it, but we could see no rational purpose in our coat-trailing D.O.P.S ... Was it to lower the morale of the

* Other Canadians flying with 45 Squadron in July included A.V. Campbell of Toronto, C.R. Hall of Sweetsburg, Que. (POW 13 June 1918), and A.E. Peel of Vancouver (WIA 10 Aug. 1917). No 45 Squadron's 1½ Strutters were replaced by Camels in July and August 1917. Jones, *War in the Air*, IV, 199

† 'Enemy planes visited us that week ... We looked up to see not one visitor but a fleet of them, great bombers riding the skies in battle formation. There were twenty-four of them, flying in perfect order and making straight for us ... Then there was a soft whirring noise and the first bomb fell with a thud and crash of flame. Then came the deluge - CRASH! CRASH! CRASH! - down they came, thick and fast.' Aubrey Wade, *Gunner on the Western Front* (London 1959), 85

‡ No 46 Squadron's Canadians during July included F.B. Baragar of Elm Creek, Man. (WIA 3 Sept. 1917), A.L. Fleming of Toronto, A.R. Fortin of Winnipeg, R.L.M. Ferrie of Hamilton (KIA 3 Jan. 1918), and H. Townson of Burnaby, BC. The squadron was withdrawn to the United Kingdom for home defence duties from 10 July to 30 August 1917. Jones, *War in the Air*, IV, 153