

story skyscraper ... had suddenly been erected in London.' The first Handley Page went to 3 Wing* where Elder formed a poor opinion of its capabilities. Magneto trouble caused delays in flying as did distorted propellers 'through either inefficient design or bad material, as far as one can judge, from the former.' A second aircraft arrived in February, and by this time the Handley Pages may well have been serviceable. It was not, however, until 16 March that the weather was judged good enough to attempt the first raid. The aircraft selected was No 1460, which had joined the wing in October. The crew consisted of Babington; Stedman, acting as observer; Flight Sub-Lieutenant C.L. Hains of Salmon Arm, BC, who served as after gunlayer; and *Adjutant* Chasard of the French air service who accompanied them as forward gunlayer and guide.³⁰

The great advantage of the big bombing aircraft was its capacity and what we would now call cost-effectiveness. The Rolls-Royce Eagle engines, each developing 250 hp, gave the O/100 an endurance of nine-and-a-half hours with an all-up weight of five-and-a-half tons, including 380 gallons of fuel and ten 112-lb bombs. For shorter raids, carrying 250 gallons of fuel in wing tanks and seventy gallons in the fuselage, the aircraft could carry fourteen 112-lb bombs. If the fuel in the fuselage was removed the load could be increased to sixteen bombs. There were sixteen cells in bomb bays under the fuselage in which bombs were hung by their nose. The bombs, when released, forced open the spring-loaded doors that covered the bomb bays. There was a bomb release handle in the cockpit beside the floor sighting opening which the observer operated by crawling under the pilot's seat. The real weaknesses of the O/100 were its lack of speed and the inaccuracy of its bomb-dropping. From the first it was considered a night bomber, with its bombing altitude of 6000 feet and cruising speed of 60–75 mph. Its bombs were to be aimed so as to straddle a target. 'The general design and operation of these machines,' stated the official training notes, 'resemble airships more than aeroplanes.'³¹

The first raid was to be fairly simple. Hagendingen was reckoned to be within the radius for which no more than two-hours endurance was required, allowing for a 30-mph headwind and a return speed of 75 mph. Babington did not take a full load of bombs because it had been found difficult to obtain correct balance both with the full load and after dropping the bombs. Consequently only the foremost bays were used, and twelve 100-lb bombs were carried. At 6000 feet a headwind of 36 mph was encountered and heavy cumulo-nimbus clouds rapidly began to form. Mist obscured the valleys so the target was changed to the railway station of Moulins-les-Metz. The aircraft reached the objective and the bombs were released, but they stuck in the bomb bay doors. Stedman had to put all his weight on the bombs to push them through, two of which were seen to explode 'close to

* Not, as claimed by some authorities, to Dunkirk. It may have staged through Dunkirk, but the destination was Luxeuil. The second went to Dunkirk and then joined 3 Wing later in 1917. The third Handley Page left England on 1 January 1917 and landed by mistake twelve miles behind the German lines. The fourth seems to have gone to Dunkirk on the same date and stayed there. Air 1/2387/228/11/38; Stedman and Waller biographical files, DHist; 'Raids Carried out by Handley Page Machines nos. 1459 and 1460,' Air 1/2266/209/70/18. Cf Bruce Robertson, *British Military Aircraft Serials, 1912–1966* (London 1966), 271; Owen Thetford, *British Naval Aircraft Since 1912* (London 1962), 212.

the objective.³² The Englishman Paul Bewsher, who served as an observer in Handley Pages, witnessed the take-off and landing for this historic raid from the ground. He heard the engines of the returning aircraft, then they switched off and No 1460 suddenly appeared '... a few hundred feet in the air, brilliantly lit up by two blindingly white lights which burned fiercely below both wing-tips, and from which dropped little goutts of luminous liquid. The powerful illumination lighted up every face, every dress, every shed and pile of stones in clear detail with its quivering glare.'³³ It was a moment of exhilaration. Even though the bombs had dropped harmlessly, Wing Captain Elder reported himself satisfied with the aeroplane and the suitability of the area for its operations. 'The machine itself ...' he was persuaded, 'exceeded all expectations.'³⁴

Three more Handley Page raids took place from Ochey in April, although on 25 March Elder had received his instructions for disbanding the wing in the near future. On the night of 5 April both Handley Pages, one of which was flown by Flight Sub-Lieutenant E.B. Waller of Toronto, flew on a raid against the railway junction at Arnaville. The other aircraft had to return with engine trouble, but Waller and his observer, Flight Sub-Lieutenant D.R.C. Wright of Toronto, dropped all their bombs at the objective. On 14 April two separate raids were carried out. One machine attacked the blast furnaces at Hagendingen; Waller and Wright bombed the depot and aerodrome at Chambley.³⁵ In only four flights the Handley Pages of 3 Wing had dropped almost as much explosive as twenty-one 1½ Strutters had been able to drop in two separate raids with ten fighter escorts.*

Where all this explosive was actually landing, however, was another matter. The CFS bombsight was still in use. As the machine approached the target the bomb aimer conveyed his course corrections to the pilot by a tug on the appropriate flying boot from where he lay beneath the pilot's seat, peering down between the sliding range bars fixed at right angles to a direction bar that comprised the sighting mechanism. Nor was the mechanical bomb release gear entirely reliable. In an attack on the blast furnaces at Metz – a highly visible target at night – one flyer '... pressed over my lever and heard a clatter behind. I pressed it over again and looked back. Many of the bombs had disappeared – a few remained scattered in different parts of the bomb-rack. I looked down again, and pressed over my lever twice more ... I looked back and saw by the light of my torch that one bomb was still in the machine. I walked back to the bomb-rack ... put my foot on the top of it and stood up. It slipped suddenly through the bottom and disappeared.'³⁶

Possible reduction of the Luxeuil Wing had been foreseen in the Admiralty as early as 12 December 1916. At that time it was only stated that 'the development of No. 3 Wing will be retarded,' but the writing was on the wall. The irrepressible C.G. Gray expressed the trend accurately on 3 January 1917 when he took to task '... the addle-pated incompetents who have thrown away good men and man-

* That is, the raids of 25 February (3380 lbs) and 16 March (1560 lbs), for a total of 4940, compared to 4800 lbs dropped by the four Handley Pages. After the first raid the spring doors were removed. Brown paper fairings in their place permitted the bombs to burst through so that the crews were subjected to a fearful draft during the flights home until the doors were modified and replaced. E.W. Stedman, *From Boxkite to Jet: the Memoirs of an Aeronautical Engineer* (Mercury Series, Canadian War Museum, Paper No 1; Ottawa 1972), 25

power on useless work, both in the air and in aeroplane factories.' The operations of 3 Wing were included in his indictment.³⁷ In February Commodore D.G. Paine, now Fifth Sea Lord and Director of Air Services, visited Haig in France. As Paine had foreseen, it would be necessary for the RNAS to draw in its horns in order to keep up the strength of squadrons on loan to the RFC on the Western Front. Paine was willing to withdraw the Luxeuil Wing, even though the French were sorry to lose the help of day bombers.

Behind Paine's co-operation in this matter lay one of the most bitter inter-service squabbles of the war. The chief protagonists were Lord Curzon, President of the Air Board, and Arthur Balfour, First Lord of the Admiralty. It was impossible for Balfour to get around the fact that the Admiralty had consistently by-passed the War Office and the Air Board in determining naval air policy. When, amidst the euphoria surrounding the aftermath of the Oberndorf raid, Colonel Barés of the French air service had visited London late in October 1916, the Admiralty's methods had finally forced the matter into the open. The French commander had been invited without consulting either the War Office or General Haig in France. Barés, it is true, did attend a meeting of the Air Board, but he had first attended a special meeting in the Admiralty which considered ways and means of conducting a strategic bombing campaign independent of other arms. This meant procuring large numbers of engines for the RNAS at a time when the RFC was desperately short. Haig was very angry and wrote, probably with the help of Trenchard and his staff, one of the seminal documents in the history of air warfare. Barés' arguments, Haig insisted, were 'based more on enthusiasm for his own particular service than on sound military judgement.'

In my opinion our military policy in aerial, as in other respects, must be based on the principle that a successful end of the war can be brought about only by decisive victory over the enemy's forces in the field.

For this, in aerial matters, the first requirement is an adequate supply of efficient artillery, photographic and contact patrol machines, with sufficient fighting machines, of the best types that can be procured to protect them.

The next most urgent requirement is reconnaissance behind the enemy's lines, and bombing of such railways, headquarters, bivouacs, etc., as may affect the issue of a battle by upsetting the enemy's organization and command, and interfering with his tactical and strategical movements.

Long distance bombing as a means of defeating the enemy is entirely secondary to the above requirements. Its success is far more doubtful, and, even when successful, both theory and practice go to show that usually its results are comparatively unimportant.

I have no reason to suppose that the bombing of open towns merely for the purpose of terrorizing the civil population is a method of warfare which would be approved by His Majesty's Government, nor would I recommend its adoption.

Colonel Barés contends that the bombing of German towns has caused the Germans to withdraw a number of their machines from the front. I do not agree with this, as there are no signs on the western front that the Germans have done this ...

In short, I am of opinion that the views attributed to Colonel Barés, as stated, are unsound in theory and should not be accepted in practice.³⁸

Curzon expanded upon Haig's theme and put forward the principle (echoing the words of the Derby Committee in April) that long-range bombing must be related to the army's plans.³⁹

By the end of March the end was near for 3 Wing, but on 1 April Elder received orders to postpone disbandment until a reprisal raid had been carried out against Freiburg. The use of the wing for this purpose had been discussed in October during the meetings with Barés, at a time when British opinion was especially agitated by alleged German atrocities. In August the British government had cited a number of incidents to the International Red Cross, including the execution of Edith Cavell, the neglect of allied prisoners of war suffering from typhoid fever, the sinking of the passenger ships *Lusitania* and *Sussex*, and the execution of Captain Charles Fryatt. Fryatt, a merchant marine captain, had attempted to ram a U-boat and was executed on the grounds that he had contravened the rules of war. When Captain James Blaikie of the SS *Caledonia* seemed in danger of a similar fate, there was agitation in Britain that his death be paid for by the execution of a high-ranking German prisoner of war. Instead, the British government determined to use 3 Wing in an attack on Freiburg, an open town. The wing remained under orders to prepare for this mission until 19 December, when the planned raid was abandoned after the German Foreign Office indicated that no action would be taken against Blaikie. It was revived when the hospital ship *Asturias* was torpedoed on 20 March 1917; an infuriated English public demanded revenge both for this and what were deemed a whole series of German atrocities.⁴⁰

The Freiburg raid of 14 April was the wing's last and it did not go smoothly. Two flights took off at about 1100 hrs, but one, 'B' flight, failed to rendezvous properly and returned to base. Wing Commander Rathbone, however, remained aloft to join 'A' flight as a fighter escort, replacing Flight Sub-Lieutenant E.V. Reid, who had engine trouble. Led by J.E. Sharman, this flight flew directly to Freiburg and bombed the town centre. Not until the flight swung round the Kaiserstuhl hill, north of town, did Sharman sight the first opposition. Three biplanes, identified as Fokkers, took off from Colmar and attacked the escorts, flown by Rathbone, Flight Lieutenant G.R.S. Fleming, and Flight Sub-Lieutenants W.E. Flett and W.M. Alexander, both of Toronto. A brief and costly combat ensued. Flett sent one of the German aircraft down out of control, but both Rathbone and Fleming were shot down. The tail of Fleming's machine was blown off and he died of injuries sustained in the crash; Rathbone became a prisoner of war. Flett had to fight his way back after becoming separated, his aircraft damaged and his gunlayer being twice wounded. Although it is possible that Sharman had not sighted all the German aircraft, there is nothing to indicate that more than one German flight took off to defend Freiburg. The loss of two of the wing's most experienced pilots to such meagre opposition was a severe blow.⁴¹

After the return of the first group, Sharman undertook to lead 'B' flight for an afternoon raid* leaving at 1530 hrs. Once again, an uneventful flight except for anti-aircraft fire marked the outward journey. In the morning Sharman had avoided enemy airfields on the return by swinging northwest to Corcieux. In the afternoon

* Sharman was awarded the DSC for this day's work.

he led 'B' flight to the northern end of the Belfort Gap, crossing the lines near Luneville before returning to Luxeuil. Enemy aircraft were not encountered until 'B' flight neared the lines. Flight Sub-Lieutenants Harold Edwards of New Aberdeen, NS, and C.E. Pattison of Winona, Ont., succeeded in bringing down one of the Germans, but Edwards was then attacked and brought down himself, so that he became a prisoner of war. The bomber of Flight Sub-Lieutenant A.C. Dissette of Vancouver was hit by anti-aircraft fire, but he crashed two kilometres inside the French lines and managed to escape unhurt.⁴²

French machines, consisting of six Sopwith bombers, five Sopwith fighters, three Nieuports, and one Spad, bombed Freiburg immediately after 'B' flight and returned without any losses. Wing Captain Elder in his report to the Admiralty pointed out that the heavy French fighter escort had thus shown its worth: '... Sopwith fighters ... are now quite outclassed by the German type of machines, and no longer form adequate protection to the bombing machines. It is only through the self sacrifice of the three missing Fighter Pilots and their Gunlayers that all our bombing machines returned safely.'⁴³ Altogether the allied aircraft had dropped nearly 5500 lbs of bombs, and the pilots reported extensive fires when they returned from the afternoon raid. They had also dropped leaflets on which was printed 'Als Vergeltung fur [sic] den Untergang des HOSPITAL-SCHIFF "ASTURIAS" welche am 20-21 Marz 1917 stattfand.'*

The Admiralty seems to have taken little interest in the results of this final raid. Not so the French. In an information bulletin based on German newspaper reports, dated 18 April and issued at Belfort, it was stated that the Karlsruhe-Leopoldville line had been blocked, the Freiburg station damaged, and about twenty soldiers killed or wounded. It was also claimed that six bombs had fallen on a theatre and an ophthalmological clinic had been hit, resulting in about thirty casualties, mostly soldiers. Months later an English professor of bacteriology, abstracting intelligence from German medical journals, learned from the *Münchener Medicinische Wochen-Schrift* that the entire comparative anatomy collection at the University of Freiburg, with its teaching materials, pictures, models, and microscopes, had been destroyed. The anthropological collection had also been pulverized. It cannot be said, then, that much satisfaction was to be taken from the reprisal. In the British Parliament Mr Bonar Law stated that the government did not wish to compete with the enemy over reprisals except when 'inevitable.' But as the French bulletin had stated, probably quoting German sources, 'L'attaque de FRIBURG forme une triste pendant au meurtre d'enfants de CARLSRUHE, le 22 juin de l'année dernière.'⁴⁴

The Luxeuil Wing thus brought its operations to a close. Most of the Sopwith bombers were turned over to the French; the naval airmen were dispersed, most of them to Dunkirk for service with the RNAS squadrons on loan to the RFC. Their task, as it turned out, had been a thankless one. Their commander met not praise but recriminations. Why had there been so few raids? Why were the

* 'As a reprisal for the sinking of the hospital ship *Asturias*, which took place on the 20-21 March 1917.'

† This referred to a French air raid in which a bomb had fallen on a circus on 21 June 1916.

material results so meagre? Elder could only reply that the operational period had been during the worst time of year, though the RNAS had flown even when the French thought the weather unsuitable. He had never been given the promised number of aircraft; most of those he had were becoming obsolete. Yet his airmen had never shirked their duty and many had far exceeded it.*

In 1937 the British official historian came to Elder's defence: 'With our fuller knowledge it is clear that the effect produced by the naval bombing wing was disproportionate to the number of raids.' He claimed that German morale in industrial centres had been shaken and that bombing had 'compelled the Germans to divert aeroplanes, labour, and material to the beginnings of widespread schemes of home defence.' The only evidence offered about the disruption of German industry is a telegram to the High Command of 18 November 1916 warning of the 'serious dislocation of work' in Düsseldorf steel plants. The same telegram is cited in the German official history for the period, published in 1938. That history attributes improvements in German home defence not to a reaction to bombing but to experience derived from the Battles of Verdun and the Somme.⁴⁵ Without further authentic German evidence, it is impossible to estimate the degree and duration of work stoppages in industry.

Did the work of 3 Wing cause a diversion of German air strength to the home front? The evidence does not appear to support such a conclusion. For example, air headquarters of the French Seventh Army reported that only seven German aircraft were available for the defence of Freiburg. All seven were committed during the raid; two were shot down and four damaged.⁴⁶ Yet they had destroyed three British aircraft, while a fourth was shot down by anti-aircraft fire. It is true that in the course of the wing's operations there had been an increasing number of air combats, but they were not because the Germans had concentrated larger numbers of aircraft on the home front, as Rathbone had suggested in March, but because improved warning systems and better machines had enabled the defenders to reach their opponents and bring them to battle.

The breakup of 3 Wing meant the loss of many pilots experienced in long-distance bombing to quite different tasks at the front. Nor was any advantage taken by the Admiralty of the knowledge acquired by the officers who had led the wing. Rathbone, of course, was a prisoner of war; Bell Davies had been transferred to flying operations with the Grand Fleet; Elder reverted to general service in an obscure sea command. Only the Handley Pages and their crews were to continue in the long-range bombing role.

Though this appears a cavalier disregard of hard-won skill, there was plenty of expertise at Dunkirk where, in fact, bombing operations had been more extensive

* Five pilots, the Canadians W.H. Chisam of Edmonton (WIA 8 April 1918), W.E. Flett of Toronto (WIA April 1917), C.A. Magwood and E.C. Potter, both of Winnipeg, and the Englishman Fitz-Gibbon, underwent some Admiralty harassment for failure to complete the raid on Saarbrücke-Burbach on 4 March. All except Potter received official censure, but Magwood did not cease to protest this decision and in June the Admiralty 'decided to accept his ... explanation and withdraw the censure.' Rathbone to Elder, 22 March 1917, Air 1/648/17/122/397; further correspondence in *ibid.* of 17 April 1917, May 1917, and 23 June 1917.

than at Luxeuil. The Luxeuil Wing had flown eighteen raids; during the same period 4 and 5 Wings had flown fifty-two missions at comparable ranges. Though many of these were tactical in nature, against aerodromes, ammunition dumps, and lines of communication, and were intended to support military operations on the Somme, most of the Dunkirk raids after November 1916 were upon Ostend, Zeebrugge, and Bruges. These raids, since they were intended to destroy shipping and dockyard facilities, may be described as having a quasi-strategic dimension.⁴⁷

As for the RFC, its bombing policy continued to reflect Trenchard's firm adherence to conventional military wisdom. It is true that Martinsydes of 27 Squadron had been flying long-distance raids for some time. In May 1917 they were joined by the DH4s of 55 Squadron. Throughout the summer and fall they raided deep into enemy-held territory, concentrating upon the area surrounding Ghent.* Since both squadrons were in Headquarters Wing, however, they came immediately under Trenchard's eye and he subordinated their work to the requirements of the army.

The meetings of the Air Board also reflected the consistency of view held by Haig and the RFC towards strategic bombing. Initially *laissez-faire* in its attitude towards the Luxeuil Wing, the RFC soon became actively disapproving, Rear-Admirals Tudor and Vaughan-Lee having to face stiff questioning from General Henderson about the deployment of naval aircraft. As always, the Admiralty was accused of staffing RNAS requirements on the basis of the engines it could get rather than on sound tactical and strategic grounds, and of being evasive about decisions it had taken. On 1 November 1916 Henderson observed that if Haig controlled the Luxeuil bombers, 'he thought that General Trenchard would bring them to the Somme, take the engines out of them and put them into fighting machines and would confine himself to bombing behind the enemy's lines as at present.' At the time the Luxeuil Wing's operations were coming to an end, Trenchard himself, in policy notes prepared in early April 1917, restated his position that bombing had to be integrated with other aerial tactics in support of ground operations – that it was by offensive fighter patrols and by bombing in the rear of the lines that German air strength was diverted from the front. As late as

* Canadians who served in 27 Squadron up to October 1917 included T.D. Campbell, E.P. Charles, and G.C. St G. de Dombasle, addresses unknown, C.M. De Rochie of Cornwall, Ont. (MIA 14 July 1917), E.D. Hicks (WIA 8 Sept. 1916) and C.N.F. Jeffery, both of Winnipeg, Man., E.W. Kirby and W. Mason, addresses unknown, A.E. McVittie of Sudbury, Ont., G.H. Morton, address unknown, W.E.G. Murray of Vancouver, P.C. Sherren from PEI, H.S. Spanner of Huntsville, Ont. (MIA 28 Dec. 1916), F.L. Stevens, address unknown (POW 4 June 1917), E. Waterlow of Regina, H.O.D. Wilkins of Norwood, Ont. (POW 28 July 1917), F.V. Woodman of Winnipeg, and P.A. Wright of Fort Frances, Ont. (wounded 3 Sept. 1916). Canadians who served in 55 Squadron during this period included S.H. Allen of Toronto, C.A.S. Bean, address unknown (POW 9 Aug. 1917), W.R. Cooke of Orillia, Ont. (WIA 13 Aug. 1917), J.B. Fox, address unknown, J.C. Hanson of Fredericton, NB (KIA 14 July 1917), J.H. Hedding and R.A. Logan (POW 8 April 1917), addresses unknown, J.C. McKeever of Listowel, Ont., P.B. McNally of Fredericton, NB (KIA 13 Aug. 1917), N.R. Murphy of Montreal, S. Nixon of Toronto, Daniel Owen from NS (POW 21 Oct. 1917), G.E.S. Rogers of Barrie, Ont. (KIA 10 Aug. 1916), A. Sattin, address unknown, and A.H. Waterman of Vancouver.

November 1917 Trenchard still held to these principles, stating that long-range bombing raids 'cannot be isolated from other work in the air, and are inseparable from the operations of the Army as a whole.'⁴⁸

It has been suggested that Trenchard professed such views out of loyalty to Haig and that once released from his command and the obligations it carried to his chief, he became free to voice other views. Hence his association both with the Independent Force and with the gospel of strategic bombing in the postwar years.⁴⁹ It is quite possible that had he at any time possessed bombing aircraft surplus to requirements of the front, Trenchard would not then have been averse to a long-range bombing offensive. Certainly he said as much. But up to mid-1917, at least, that situation had never existed. At this point events began to move swiftly to force upon Trenchard the strategic bombing role, whether it corresponded with his secret views or not.

More than to any other single factor, this change was due to the German bombing campaign against England. These raids, however, brought to a head tendencies already well advanced, both in the public mind and at official levels. Ever since the Cowdray Air Board had begun to function in January 1917, the idea of building a long-range bombing force had never been far from the surface. Most of its work had been focused upon the immediate problem of aircraft and engine production, and by 21 April it had devised a production programme that successfully related RNAS and RFC requirements to industrial capacity. Public opinion was already moving toward future bombing operations, however. On 26 April, during a parliamentary debate on the Air Board, Joynson-Hicks and Lord Hugh Cecil discussed the possibility of 'an independent striking force' and of 'sending a vast number of machines over German territory.' The Air Board was already moving toward the creation of what Cowdray was to call a surplus air fleet.* He was able to report to the Cabinet on 9 June that a considerable long-distance bombing force was a possibility for the 1918 campaign. Early that month the board decided to order a thousand DH4s, of which seven hundred were to be modified for long-range bombing to 'provide material for an interim bombing programme pending the production of a specially designed long-distance bomber.' Thus even before the German raids had had their shock effect, the process was underway.⁵⁰

By early June the first two Gotha raids on England had taken place. The War Cabinet had considered, and postponed decision on, 'frightfulness' as an appropriate response, despite the suggestion of the Consul-General at Rotterdam that Frankfurt, as 'a centre of finance and of socialism,' would be a target from which 'good psychological results' might be harvested. But the Cabinet was driven to act by the emotion generated over the raid of 13 June with the heaviest casualties of

* Cowdray first used the phrase 'Surplus Aircraft Fleet' in a letter to Smuts of 28 July 1917. He seems to have been an early convert to the views of Sir William Weir. A Scottish engineer and industrialist, Weir had become an official of the Ministry of Munitions in 1915. In December 1916 he was given a seat on the Air Board. In February 1918 he became Director-General Aircraft Production. Following the resignation of Lord Rothermere he became Secretary of State for Air on 27 April 1918. See W.J. Reader, *Architect of Air Power: the Life of the First Viscount Weir of Eastwood, 1877-1959* (London 1968); Cowdray to Smuts, 28 July 1917, Air 1/33/15/1/199.

the war, including sixty-six school children killed. Under mounting public pressure the War Cabinet made a remarkable series of decisions. Aircraft manufacturing was to be given priority over all other forms of weapon production; there was to be a spectacular increase in the number of RFC squadrons, from 108 to 200, and a comparable increase for the RNAS; the output of engines was to be stepped up from the current 1200 to 4500 a month; forty of the new squadrons were to be set aside to undertake the reprisal bombing of German cities. None of these decisions had any immediate effect. Despite its evident belief that Germans were more susceptible to the terrors of bombing than were the English, the War Cabinet accepted the report of a committee, composed of Generals Henderson and Trenchard and Commodore Paine, that it was useless to strike at Germany before enough aircraft were available to mount a continuous offensive and that this was unlikely before the spring of 1918 unless Haig were to be deprived of badly needed air strength.⁵¹

Then came the dramatic raid of 7 July, during which the utter helplessness of defence forces was demonstrated to millions of Londoners. That same afternoon the Cabinet requested Haig to undertake a reprisal raid against Mannheim, unless 'this would completely dislocate his plans.' When Haig and Trenchard demurred on the grounds of limited resources and scepticism about the utility of reprisals, the project was dropped. Nevertheless, Trenchard began preparations for such a raid, should it be ordered, including the provision of a train for shuttling squadrons from the British sector to Nancy and the investigation of aerodrome facilities and fuel supplies.⁵²

On 11 July, as was noted in the last chapter, the Cabinet took a more significant action. It named Lieutenant-General J.C. Smuts as a committee of one (nominally joined by the Prime Minister) to report on aerial home defence and upon air organization and the future direction of air operations. Smuts' chief adviser was Sir David Henderson, a fateful choice. From his years of experience in dealing with the politics of a divided air service, Henderson had become an advocate of unification. In a long memorandum for Smuts, he rehearsed the many problems that had arisen between the RFC and the RNAS and concluded that 'logically the desirability of a separate unified Air Force is almost beyond dispute.' He therefore supported the creation of an air ministry with control over air policy, provided such a step could be taken without serious damage to the war effort.⁵³

When Smuts submitted his own report on 17 August, the influence of Henderson was plain. Much of its first section was a recapitulation of Henderson's evidence. Its chief recommendations, that an air ministry be instituted 'as soon as possible' and that the RNAS and the RFC be amalgamated, were in accord with Henderson's views. But there was another dimension. Unlike other army corps such as the artillery, Smuts argued, an air service 'can be used as an independent means of war operations,' as the German raid of 7 July had proved. He went on: 'Unlike artillery an air fleet can conduct extensive operations far from, and independently of, both Army and Navy. As far as can at present be foreseen there is absolutely no limit to the scale of its future independent war use. And the day may not be far off when aerial operations with their devastation of enemy lands and destruction of industrial and populous centres on a vast scale may become the

principle operations of war, to which the older forms of military and naval operations may become secondary and subordinate.⁵⁴ How far Henderson accepted the apocalyptic strain in Smuts' report is impossible to say. Presumably, however, it was a price he was willing to pay for the creation of an independent air force.

On 24 August, seized by the vision that the war might be won by means more economical, at least in manpower, than the ghastly slaughter of the trenches, the War Cabinet approved in principle the recommendation that a separate air service be formed. A committee headed by Smuts and including Henderson, Paine, and Lord Hugh Cecil was set up to work out the procedures for amalgamation of the air services and to draft the necessary legislation.⁵⁵

Reproof was not long in coming from the soldiers. Writing to Haig's chief of staff, Trenchard vehemently and even contemptuously attacked the Smuts report. 'The contention,' he wrote, 'on which the whole argument for a separate Air Service is based is that the War can be won in the air as against on the ground. Nothing but bare assertion is urged in support of this contention. It is, in fact, merely an opinion ...' Glossed over was the hard challenge of bombing Germany, when the whole route would have to be flown over hostile territory. Why should it be imagined that the bombing of German cities would bring strategic results when German raids upon England 'have had no effect whatever on the course of the war'? Turning to the proposal for a separate air ministry, he argued that such an organization, with a civilian head and without the saving check of professional military and naval control, would inevitably be exposed to 'popular and factional clamour' and hence 'be drawn towards the spectacular, such as bombing reprisals and home defence, at the expense of providing the essential means of co-operation with our Naval and Military Forces.'⁵⁶

Haig waited two weeks before passing on the substance of Trenchard's argument, in somewhat more diplomatic form, to Sir William Robertson. Under certain circumstances, he conceded, a case was to be made for long-range bombing: 'Long distance bombing designed to cripple the enemy's naval and military resources and hamper his movements may certainly give valuable results. The bombing of populous centres may also be justifiable, and may prove effective, in order to punish the enemy for similar acts previously committed by him, and to prevent their recurrence. Once such a contest is commenced, however, we must be prepared morally and materially to outdo the enemy if we are to hope to attain our ends.'⁵⁷ From Haig's viewpoint, however, the Smuts report gave a weight to bombing that officers having 'wide *practical knowledge*' could not accept. Bombing might well have profound significance for wars of the future but the experience of the present war showed only its limitations. In their different ways, Haig and Trenchard were both apprehensive that the expansion of squadrons in pursuit of what they could only regard as a visionary objective would be at the expense of aircraft for the army. Neither had much confidence in Weir's optimistic production forecasts; both were aware that the original RFC expansion programme of 1916 was still far from being met; and both knew, and feared the Cabinet did not, that there was an inevitable lag between increased production levels and the appearance of trained crews ready for actual operations.

No longer, however, could Haig and Trenchard count upon staunch support at home. Not only had Henderson shifted his ground, but even Robertson had done so, albeit temporarily, after the raid of 7 July. Perhaps the most significant changes of view had been taking place within the Admiralty. In the Air Department itself, of course, bombing had always been regarded more sympathetically than at the War Office and the recent turn of events was much to its liking. Squadron Commander Williamson, in the course of a paper discussing the possible bombing of German chemical works, recommended formulation of a clearly defined bombing policy and warned that the navy must not lay itself open 'to the charge that there has been a lack of official foresight and imagination.' There was little danger of that.⁵⁸

Now the Air Department found new allies on the Air Board. Instead of the two services being at daggers drawn over the value of bombing, they debated such matters as the relative merits of day and night bombing. Henderson upheld the performance of the DH4 and the superior accuracy of day bombing, while Paine, with Weir's backing, spoke for the Handley Page because it carried six times the load of the DH4 and had three times the endurance. Moreover, no Handley Page had been lost to enemy action during night raids and there had been no exceptional difficulty about finding targets. Seven hundred DH4s were earmarked for bombing, but development work continued on the improved DH9, and the Air Board also decided at the end of July to go ahead with the production of a hundred Handley Page bombers. By 6 September orders had increased to over 2700 DH4s and 9s, and 300 Handley Pages. So complete was the ascendancy of the bomber school at this point that on 24 September the Air Board noted that it could use 'every bombing machine we could get,' foresaw a production rate of three hundred DH9s per month by the end of January, and approved an increase in Handley Page 0/400 production, already at around a hundred per month, to two hundred per month by June 1918. At the same time, at the highest level of the Admiralty, there had been a radical change of heart since the debates between Balfour and Curzon. At the time the Smuts report on air organization was discussed by the Cabinet the new First Lord, Sir Eric Geddes, stated that 'His Department recognized ... that there were strong reasons in favour of a definite development of Air Policy, and they accepted without question the views of those who had investigated it ...' Although he wanted to preserve the RNAS and keep air operations at sea under naval command, Geddes was ready to turn over to a new service duties not 'of a purely Naval character.'⁵⁹

There were still those in the Cabinet who doubted both the bombing strategy and the idea of a separate air force, two policies now inextricably joined. The Germans supplied the final push with their switch to night raids. For three nights, beginning on 2 September, raids were launched, with London the main target on the 4th. The next day the War Cabinet agreed that 'we must carry the aerial war into Germany, not merely on the ground of reprisal,' and got assurances from Weir and Henderson that the necessary aircraft and trained airmen would be available.⁶⁰ The Cabinet then marked time until the night raids were resumed on a larger scale on 14 September and, with the exception of 26 and 27 September,

were continued until the end of the month. The Cabinet's reaction was summed up in a cipher telegram sent to Haig by the CIGS on 1 October: 'Continuous Aircraft raids on ENGLAND are causing interruption in munitions work and having some effect on general public. Cabinet desire immediate action against those German objectives which can be reached from neighbourhood of NANCY. Send Trenchard over at once to me to discuss scale on which you can undertake these operations and necessary arrangements for them. Cabinet wish for at least one squadron to be employed with least possible delay.'⁶¹ For the last time Haig and Trenchard registered their objections, but the Cabinet was in no mood to entertain them. No faith was left in the successful outcome of the Flanders battle, now mired at Passchendaele; a public outcry had to be stilled and bombing, politically and perhaps militarily, seemed the answer. When Trenchard returned to France he took with him orders to Haig to detach a day- and a night-bombing squadron from Headquarters Wing, and as soon as possible 'to undertake a continuous offensive, by air, against such suitable objectives in Germany as can be reached by our aeroplanes.' Eight Handley Pages with crews were detailed to join this force from the Admiralty, and Trenchard was further ordered to consult the Vice-Admiral Dover about using Dunkirk Handley Pages for the bombing of the Rhine towns in the Cologne area. Thus was 41 Wing established, under the command of Lieutenant-Colonel C.L.N. Newall of Headquarters Wing, with its base at Ochey.⁶² An 'independent' bombing force had come into being, and its corollary, an independent air force, was shortly to follow.

A last flurry of debate ensued before the final step was taken, for there were lingering doubts in the mind of the Prime Minister and misgivings about the efficacy of a bombing offensive held by some of his colleagues. During October the air power enthusiasts vigorously pushed for a final decision. Prominent among them was Rear-Admiral Mark Kerr, now a member of the Air Board,* who attacked, in simplistic fashion, criticism of the Smuts report. Kerr argued that 'whichever side first gets its great bombing squadrons to work, automatically establishes superiority in every branch of offensive weapons by reduction of the enemy's output and victory naturally follows.' On 10 October he was told by Lord Cowdray that it was almost certain that an independent bombing force to attack Germany would *not* be formed, an opinion that probably reflected Lloyd George's wavering on the subject during the previous day's Cabinet meeting, and perhaps also a belated plea by the CIGS at that meeting for a reconsideration of Haig's needs at the front. Kerr promptly prepared a memorandum which Cowdray delivered to Lloyd George and Smuts. Citing Italian and other intelligence, Kerr alleged that the Germans were building four thousand large bombers, many of

* Kerr had little practical experience to back his role as an adviser on air power. He had qualified as a pilot in 1914, but at the outbreak of the war he was on loan to the Greek government, and served as Commander-in-Chief of the Royal Greek Navy. Subsequently he commanded the British Adriatic Squadron until August 1917, by which time he was scarcely in touch with significant wartime developments in military aviation. In September the Admiralty saw fit to recall him to London to serve as an adviser on aviation. After the birth of the RAF, Kerr became its Deputy Chief of Staff. See his *Land, Sea and Air: Reminiscences of Mark Kerr* (London 1927), 284-94.

which were huge six-engined machines capable of carrying up to five tons of explosives. 'Woolwich, Chatham, and all the factories in the London district will be laid flat,' he predicted, 'part of London wiped out, and workshops in the south-east of England will be destroyed, and consequently our offensive on land, sea, and air will come to an end.*' He urged 'the building of 2000 big bombing machines as a minimum,' and warned once more that 'the country who first strikes with its big bombing squadrons of hundreds of machines at the enemy's vital spots will win the war.'⁶³

This absurd document, or 'bombshell,' as its author termed it, was duly considered by Cabinet. It was an example, though an extreme one, of the kind of emotional support the idea of strategic bombing, and hence a separate air service, was now receiving, and it seems to have made some impression upon the Prime Minister. In 1934 Trenchard recalled that 'At a Cabinet meeting Lloyd George said to me "The Germans are going to bomb London with 4,000 aeroplanes." I said to him, "Nonsense, 40." We had a row. He said, "Why do you talk like that?" I replied that even if the Germans had 4,000 aeroplanes to bomb London with, which I did not believe, it would take them months to organize aerodromes and the whole paraphernalia of preparation. I gave him practice not theory.'⁶⁴

Surprisingly enough, in view of his early and aggressive backing of long-distance bombing, it was Winston Churchill, the Minister of Munitions, who was the chief spokesman for the views of Haig and Trenchard. He debunked the notion that an air offensive, by itself, could bring victory. British morale had not really been fundamentally shaken by German raids and 'nothing that we have learned of the capacity of the German population to endure suffering justifies us in assuming that they could be cowed into submission by such methods, or, indeed, that they would not be rendered more desperately resolved by them.' Churchill believed that a bombing offensive ought to be co-ordinated with the operations of land and sea forces and should strike at enemy bases and communications 'upon whose structure the fighting power of his armies and his fleets of the sea and of the air depends.'⁶⁵

But the time had passed when such arguments could sway the Cabinet. On 6 November it approved the Air Force bill. Duly passed by Parliament, it received royal assent on 29 November. The way was now clear for a strategic bombing offensive against Germany, conducted by an independent air force to come into being in early 1918. These great decisions were to affect the employment of Canadians in air operations, and, in the long run, were to have a fundamental influence upon Canadian defence policy.

* It seems scarcely credible that such a memorandum should have been written by a responsible staff officer, and even less credible that its contents apparently went unchallenged. Obviously he was referring to the German giant bombers, and possibly to the Staaken R-VI which had a disposable load of two tons. This aircraft was virtually hand-constructed; four thousand of the type was utterly beyond German capacity. During the entire war only 117 R planes were built, and only thirty-seven of them were delivered during the final two years of the war. See G.W. Haddow and P.M. Grosz, *The German Giants: the Story of the R-planes, 1914-1919* (London 1962).

The Strategic Air Offensive against Germany

From October 1917 to the end of the war the claims for the strategic effectiveness of the air weapon which had formed so important a part of the decision to create the Royal Air Force were put to the test. Admittedly, the test was hardly a fair one. Neither the Independent Force nor its forerunner, 41 Wing, received aircraft and aircrew in numbers even remotely approximating those promised. At the same time, however, there was a curious disjunction between the aims and aspirations of the new Air Staff in London, dreaming its dreams of victory through airpower, and the actual nature of the operations carried out by the strategic bombing force upon which so many hopes were pinned. The air commanders in the field did not set out deliberately to frustrate the plans of the Air Staff, for those plans were essentially unrealizable. But in the end it was Trenchard and not the Air Staff who called the tune.

Such a split was clearly probable from the outset. Controversy surrounded the first appointments to the Air Ministry, including that of the first Air Minister, Lord Rothermere. An Air Council under his presidency was established on 3 January 1918; its vice-president was Sir David Henderson. Trenchard was prevailed upon to become Chief of the Air Staff and was given Rear-Admiral Mark Kerr as his deputy. Within a few weeks of the official birth of the Royal Air Force, on 1 April 1918, not one of these men remained at his original post. Kerr had disagreed with Trenchard, and Brigadier-General R.M. Groves had been appointed in his place. Rothermere had given way to Sir William Weir; Trenchard had resigned, to be replaced by his old rival Major-General Frederick Sykes; Henderson had left, finding it impossible to work with Sykes.

These events had much to do with personal antagonisms and old service rivalries, but policy was also at stake. Trenchard did not get on with Rothermere, but just as important, the Minister did not regard him as his only source of professional advice. As Trenchard wrote to Haig, the Minister had 'introduced a lot of people to the Air Ministry without consulting anybody'; moreover, Rothermere 'preferred any advice to that of his professional advisers.'¹ In frustration, Trenchard bypassed his Minister and wrote to Lloyd George. He pointed out that Air Staff planning was proceeding on the assumption that by the end of May there would be twenty-five bombing squadrons at Nancy, and that by the beginning of July there would be forty. Yet so far as he could see, there could not possibly be

more than nine by the latter date. Therefore, he argued, 'It is far better to know what can really be done so as to be able to count on it than to indulge in more generous estimates which cannot be realised.' His own prescription was to use this small force to attack the 'big industrial centres on the Rhine' when weather permitted, and, when long-distance raiding was ruled out, to strike at the steel centres closer at hand. He also suggested using Dunkirk's two Handley Page squadrons to attack the submarine facilities at Bruges and Zeebrugge, and employing army bombing squadrons to raid the bases near Ghent from which the Gothas were launching their attacks upon England. Targets of immediate concern to the army, such as lines of communications, headquarters, ammunition dumps, railway stations, and aerodromes could be tackled by short-range squadrons working directly under GHQ control.²

These proposals, though they conformed closely to the realities of industrial production, were unwelcome to Rothermere. They may be contrasted with the advice offered the Minister by Sir Henry Norman, an MP who was an additional member of the Air Council. Norman was deeply concerned by the failure of bomber production to meet expectations. On 25 March he wrote to Rothermere that 'we shall not be in a position to carry out bombing operations in Germany upon a large scale likely to have an appreciable influence upon the course of the war before next autumn, if even then.' Unlike Trenchard, however, his solution was not to adjust bombing operations to the resources likely to be available. For Norman, bomber production had to be given the highest priority, for 'The future of our race and Empire may depend upon whether or not we rise now - though it be at the eleventh hour - to this conception.'³

The conception (provided the bombers were available) was the total obliteration of six German cities: Essen, Cologne, Frankfurt, Düsseldorf, Stuttgart, and Mannheim. He hypothesized that this could be done by a force of 250 bombers, which would attack a given city in flights of twenty-five aircraft at hourly intervals. A ten-hour raid would deliver two hundred tons of bombs, a weight sufficient to swamp the city's fire fighting services and air defence forces. The German cities would be 'practically wiped out, so far as their collective existence and productivity were concerned ... My own opinion is that if such attacks were pursued for a month, our victory in the war would be in sight.'⁴ It is clear that Norman grossly underestimated the amount of force required to cause the kind of damage he had in mind. Moreover, his ideas had so little relationship to reality that he was actually proposing to drop a greater weight of bombs in a ten-hour period than the existing bomber force, 41 Wing, managed to drop in five months of operations.

The new team of Weir and Sykes was as dedicated to strategic bombing as Rothermere and his associates had been, though their aspirations lacked the grandiose character of the Norman proposals. Shortly after taking over as Chief of the Air Staff Sykes established a 'Strategic Council' consisting of himself, the Director of Flying Operations, and the Controller of the Technical Department to 'consider questions of policy in their strategic aspect and the best utilization of aerial resources.' On 22 April this body met for the first time to evaluate a working paper which accurately reflected the hopes held out for the bombing offensive by the staff.

The object of the bombing offensive, as outlined in this document, was not to wipe out whole cities but, if possible, key German industries. This was much closer to Trenchard's position than to Norman's. At this early stage, however, staff planning was based upon a much rosier view of the aircraft supply situation than that taken by Trenchard. It was argued that conceivably as much as 80 per cent of the German chemical industry could be destroyed in twelve raids, and that perhaps 95 per cent of the magneto industry could be similarly destroyed in three raids. These tentative projections were based upon the calculation that a thousand DH4 sorties in a single raid would obliterate a chemical works and that a typical magneto factory would be destroyed by five hundred sorties.⁵ In other words, to achieve these objectives some 13,500 sorties would have to be flown. As it happens, the Independent Air Force, during the whole period of its operational existence, was able to fly only about one-fifth this number of sorties. A raid of one thousand sorties was totally beyond the realm of possibility. During June 1918, an active flying month, the Independent Force never managed to mount more than forty-five sorties in a single twenty-four-hour period. The 'obliteration theory' was simply unworkable.

Nevertheless, it was upon the assumption that the obliteration of key German industries could be accomplished that plans were made for the establishment of a strategic bombing force, to be called the Independent Air Force. General Trenchard, in deciding to accept the command of this force on 8 May, seems to have been influenced by erroneous accusations that he had resigned as Chief of the Air Staff 'at the height of a battle,' when in fact his resignation had been tendered prior to the beginning of the German offensive in France. Yet the appointment was a strange one. Despite Trenchard's experience and high qualities of leadership, he was on bad terms with Sykes and suspicious of Weir. Even more important, he had been the most vigorous opponent of strategic bombing and of the concept of an independent force.⁶

The cornerstone upon which Trenchard's new command was to be built was 41 Wing. The wing had arrived in the Nancy area on 11 October 1917, and its commander, Lieutenant-Colonel C.L.N. Newall, had established his headquarters at Bainville-sur-Madon. His day-bombing squadron, No 55, was also based there, while the two night-bombing squadrons, No 100 and 'A' Naval,* were based at Ochey.

No 55 Squadron had been engaged in day-bombing operations with 9 (Headquarters) Wing since March 1917.[†] It was equipped with the DH4 and its airmen were thoroughly familiar with the characteristics of this excellent aircraft. When powered by a 375-hp Rolls-Royce Eagle VIII engine the DH4 was capable of a speed of 133.5 mph at 10,000 feet, could climb to 15,000 feet in a little over sixteen minutes, and had a service ceiling of 22,000 feet. With a bomb-load of two 230-lb or four 112-lb bombs, its endurance was nearly four hours. This could be

* 'A' Squadron was redesignated as 16 (Naval) Squadron on 8 Jan 1918. Upon the birth of the RAF it became 216 Squadron RAF.

† At the time of its attachment to 41 Wing, five of No 55's airmen were Canadians. They were J.B. Fox and N.R. Murphy, both of Montreal, Daniel Owen of Annapolis Royal, NS (POW 21 Oct. 1917), and A. Sattin and J.H. Hedding, addresses unknown.

stretched to five-and-a-half hours by reducing bomb-load and adding extra fuel tanks. The DH4 was faster than the Gotha IV and had a higher service ceiling; the Gotha carried a heavier bomb-load of 660 lbs. It was undoubtedly the best day bomber the Independent Force was to have. As flown by 55 Squadron, the DH4s were deployed in triangular formations of six with the second two machines fifty feet above and the three rearward aircraft below the formation leader. As long as close formation was kept, enemy aircraft found the DH4s a formidable and unrewarding target.⁷

No 100 Squadron, however, was poorly equipped. On its arrival in France in March it had received FE2bs, obsolescent aircraft which had first flown operationally in 1915. Their 120-hp Beardmore engines brought them struggling to their 9000 foot service ceiling in thirty-four minutes. They could carry a bomb-load of three 112-lb bombs; their endurance with that load was about three hours. These characteristics made them suitable only for short-range night operations.* Many of the airmen with 'A' Naval had learned their business with 7 (Naval) at Dunkirk, while others had begun training at Manston only in June and July.[†] It was equipped with ten Handley Page 0/100s, six of them from 7(N) and the other four from Redcar, where they had been used in September on anti-submarine patrols. The Handley Pages were not markedly faster than the FE2bs, but, as we have seen, in other respects were vastly superior. Their bomb-load was at least three times as great and their remarkable endurance of eight hours made them eminently suitable for long-distance night operations.[‡]

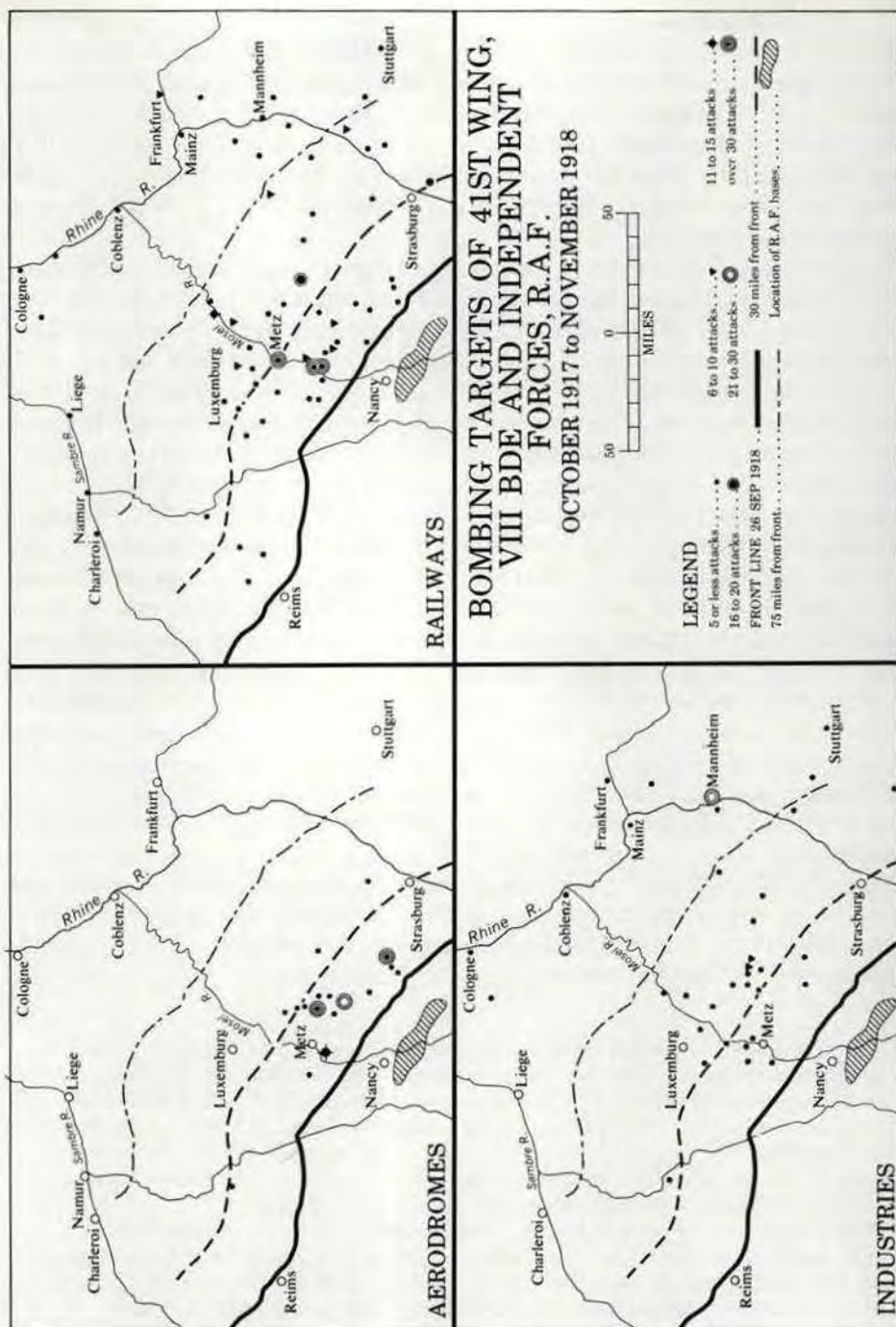
The operational base of 41 Wing was behind that portion of the French line held by the *Groupe des Armées de l'Est* commanded by *Général* de Castelnau. At the time of the wing's arrival the GAE was commencing a strategic bombing offensive of its own, the main objective of which was to 'blockade'[§] the coal and iron resources and steel plants of Lorraine and Luxembourg. The French night-bombing units, equipped with Voisin 8s, were to attack mines and steel works at Thionville, Bettembourg, Luxembourg, Maizieres-les-Metz, and Longeville, and were given Treves and Saarbrücken as 'reprisal' targets should the need arise. Their Sopwith 1½ Strutter day bombers were to attack railyards, industrial plants, aerodromes, and thirteen designated 'reprisal' towns.

* When 100 Squadron arrived at Ochey it was at least half Canadian. The pilots were L.M. Archibald of Toronto (POW 24 Oct. 1917), J.J.L. Drummond of Spencerville, Ont., W.H. Jones of Winnipeg (POW 25 Oct. 1917), W.K. MacNaughton of St Jean, Que., V.E. Schweitzer of Portage la Prairie, W.J. Tempest of Perdue, Sask., and G.M. Turbull of Manville, Alta. The observers were S.M. Duncan of Ottawa, J.W. Edwards of Cataraqui, Ont., J.S. Godard of Ottawa (POW 24 Oct. 1917), R.C. Pitman of Saskatoon (POW 17 Sept. 1918), J.W. Price of Moncton, and A.H. Thompson of Penetanguishene, Ont. (KIA 26 Sept. 1918).

† When the squadron arrived at Ochey, only three Canadians were on its strength. They were H.M. Costain of Brantford, Ont., G.A. Flavelle of Lindsay, Ont., and A. Macdonald of Toronto. All were pilots. Before the end of the year two more Ontarians, L.R. Shobottom of London and A.H. Thompson of Penetanguishene (KIA 26 Sept. 1918), joined the squadron as pilots.

‡ The word is taken from a British translation of de Castelnau's operation order of 18 Oct. 1917, and seems to imply an attempt to isolate Germany from the iron and coal resources of Luxembourg and Lorraine. 'Plan of Bombardment Operations during Winter of 1917-1918,' 18 Oct. 1917, Air 1/970/204/5/1108

§



These targets overlapped considerably with those contemplated by 41 Wing, although the DH4s and Handley Pages had a much greater range than the French aircraft. Haig's orders were that 41 Wing was to confine itself to the Saarbrücken area until the pilots had learned the country. Only then did he authorize co-operation with the French 'whenever the weather is not settled enough for long-distance raids into Germany.' In fact, the French and British bombing forces were mounting parallel offensives from the same bases, but there was little genuine co-ordination of activities until the German offensive in March. Nevertheless, on 21 October *Général Pétain*, Commander-in-Chief of the French armies, wrote to Haig enclosing a copy of de Castelnau's plan of bombing operations. He drew Haig's attention to the fact that French bombing forces had been ordered to avoid provoking unnecessary reprisals on French towns through 'promiscuous bombing by isolated aeroplanes' and urged Haig to adopt a similar policy for 41 Wing. Newall was cautioned to restrict daylight raids to legitimate objectives, to employ no fewer than six aircraft per raid, and to keep night raids as concentrated as possible.⁹

Meanwhile, on 17 October the wing had launched its first raid. The target was the large steel works at Saarbrücken-Burbach. Eleven DH4s, of which three returned with engine trouble, took part. According to German records, the raid inflicted 17,500 marks' worth of damage upon the works and houses in the area. Five people were killed and nine injured. On 21 October 55 Squadron attacked the factories and railyards at Bous with twelve DH4s. The target, on the Moselle north of Hagendingen, was about sixty miles from Ochey. Only one aircraft was forced to return with engine trouble; the rest bombed the town. As they completed their bombing runs they were pounced upon by a formation of ten Albatros D-1 fighters. In a short, sharp encounter the squadron claimed four Albatros shot down, at the cost of one DH4. It was piloted by one of the flight leaders, Captain Daniel Owen of Annapolis Royal, NS. During the battle Owen had his left eye shot out, but despite this most painful wound was able to force-land his aircraft ten miles inside enemy territory.*¹⁰

On the night of 24 October, one of fog, wind, and rain, the night bombers got their baptism. 'A' Squadron despatched nine Handley Pages against the Burbach works, while 100 Squadron sent sixteen FE2bs against the railyards between Falkenburg and Saarbrücken. The Handley Pages do not appear to have found their assigned target, for the Burbach works, where a complete record of bomb damage was kept, listed nothing for that date.¹¹ Nevertheless, two of the Handley Pages failed to return and for Flight Sub-Lieutenant Alec MacDonald of Toronto it was the beginning of thirteen months in a German POW camp. Flight Sub-Lieutenant Gordon A. Flavelle of Lindsay, Ont., making his first operational flight,[†] recorded his experience in his logbook: 'Dropped bombs on target but

* At the time of his capture Captain Owen had just been sent a letter from his brother, also with the RFC and a Bulgarian prisoner, envying his freedom. Owen was repatriated in August 1918 as unfit for further military service.

† It is instructive to note that at this point Flavelle had a grand total of fifty-three hours' flying time, of which eleven were on Handley Pages. This limited experience was typical of most of the pilots in the Independent Force.

could not see results for clouds. Lost ourselves on way back. Crashed machine near St. Dizier. Nothing left but tail and part of fuselage. 1 blade of starboard prop dug into Halley's back but did not cut. Self thrown clear. Hit on head and left shoulder cutting head slightly.¹² No 100 Squadron seems to have had somewhat more success, reporting several direct hits on the railyards, as well as one by a 230-lb bomb on a train caught by the raid. Two aircraft, both flown by Canadians – Lieutenants L.M. Archibald of Toronto and W.H. Jones of Winnipeg – were lost. Both these pilots and Archibald's observer, Lieutenant J.S. Godard of Ottawa, were taken prisoner.¹³

As October drew to a close a few more raids were launched. One of them, an attack by nine FE2bs on the Völklingen steel works, caused a moderate amount of damage according to German reports. Overall, the wing had dropped over eleven tons of bombs in eight raids during its first month of operations, but the force was not really in a position to mount a strong offensive. Wing Captain Lambe, who visited Ochey to find out why his naval pilots had been sent on no further raids after 24 October, reported angrily to Vice-Admiral Bacon that Newall had thrown the Handley Pages into battle indiscriminately. The squadron had no skilled workers on strength, such as acetylene welders, fabric workers, painters, or vulcanizers. Of the ten machines sent to Ochey, two were missing, one was wrecked, two were damaged and could not be repaired until stores arrived from England, and two complete crews were lost. The Fifth Sea Lord, who saw Lambe's report a week later, commented that '... these machines were collected and dispatched with the utmost speed by order of War Cabinet & were necessarily a scratch lot & the only H. Page machines available. If the Officer in Command will use the machines for extended raids directly they arrive & in unsuitable weather numerous casualties must be expected.'¹⁴

The onset of bad weather confined 41 Wing's operations to one raid in November and four in December, all against industrial targets. The Germans chose to retaliate by attacking 41 Wing itself. Two bombing attacks were made upon the Ochey aerodromes in November, and two more in December. In the raid of 4–5 December sixteen of the wing's aircraft were damaged, while at a neighbouring French aerodrome two sheds were burnt, destroying ten aircraft and damaging fifteen more. There was some disgruntlement with their allies among the British airmen, because 'The French either cleared off the moment the attack started or else went into dug-outs leaving our men to put out the fires that had started in the French sheds.'¹⁵

During the late winter months 41 Wing's operational activities were limited by weather. Otherwise it was a hive of industry, since it was the nucleus for the planned new departure in air warfare. In February the wing was placed under a new headquarters, VIII Brigade, and Newall was promoted to brigadier-general to command it. Work was pushed on to provide room for seventeen additional day-bombing squadrons at Azelot, Frôlois, and Bettoncourt. For eight projected night-bombing squadrons, fields were being prepared at Xafféwillers and Roville. At Vezelise the existing park and railhead were being expanded, while an additional park was under construction at Rambervillers. When requesting space for these new squadrons (and sweetening the pill by promising bombing support

whenever possible to the French army), Major-General Salmond informed the Commandant of the American Aviation Service that between 1 April and 31 July VIII Brigade was to be built up to forty squadrons.*¹⁶

Meanwhile, Newall seized every opportunity to send out his bombers, though the targets attacked were almost invariably within close range. The exposed observer's seat right in the nose of the FE2b was an unenviable position during these winter raids, as Lieutenants G.E. Lucas of Sarnia and W.H. Curry of Toronto found when 100 Squadron raided the blast furnaces of Maizières, just north of Metz, on 4-5 January 1918. Curry was out again the next night when six FE2bs attacked the railway station and sidings at Conflans, a few miles to the west of Metz, along with another Canadian observer, Lieutenant J.W. Price. On both occasions the weather was so poor that no estimate of results could be made. On 14-15 January the steel works at Thionville (Diedenhofen) was the squadron's objective, but S.M. Duncan of Ottawa claimed to have dropped his bombs in the 'centre of town' along with the other observers. Twice during the winter period the squadron was stretched to the limit to make the two-hundred-mile round trip to Treves (Trier) and its barracks and railway installations. Lieutenant J.W. Edwards of Cataraqui, Ont., made the first trip, while Duncan and Price took part in the second. This latter raid, of 18-19 February, was a severe one according to German accounts. The Chancery Court building was destroyed, as were a number of railway buildings. One aircraft 'flew very low, just missing the tops of the houses'; the town's anti-aircraft guns were depressed so far that they had to cease firing to avoid hitting houses. This aircraft was flown by a British pilot; Duncan, his observer, managed to plant two bombs near the station during his wild ride.¹⁷

The day bombers of 55 Squadron were also quite active during the winter period. The fortunes of Captain J.B. Fox of Montreal, an experienced pilot who was one of the squadron's flight leaders, illustrate the nature of its operations, and some of its difficulties. Shortly after noon on 12 February two formations of six DH4s each, the second led by Fox, departed to bomb Karlsruhe. Diverted by poor weather to Offenburg, they bombed its railway yards from 13,500 feet, though incendiaries were seen to fall upon houses in the town. The first formation returned to base uneventfully, but low cloud which had moved in swiftly forced Fox to steer a compass course for home. A radical shift in wind drove his formation off course and his six aircraft made emergency landings at widely scattered points south of Nancy. On 19 February he led twelve DH4s to bomb Mannheim, but finding the Rhine Valley shrouded in mist, he decided instead to attack Treves. His formation bombed from 15,000 feet, its incendiaries starting fires, later confirmed by photographs, in two residential areas. On the way home the formation was attacked by five Albatros scouts, an observer being wounded, and one DH4 was shot down by anti-aircraft fire.

Fox and the squadron were back at work the next day, as he led ten machines against either Mannheim or Kaiserslautern. Shortly after an 0846 hrs departure

* At the bottom of the draft, in Salmond's handwriting, there is a note indicating that the Independent Force would eventually have fifty-five squadrons, including thirty-eight of DH9s and seventeen of Handley Pages.

one bomber spun (retaining its bomb-load) from 5000 feet to 1000 feet and the shaken crew chose to return to base. Heavy cloud conditions caused a second machine to lose touch with the formation, and it too returned. Having led his remnant across the lines at 14,000 feet, Fox discovered that a strong headwind was reducing ground speed so drastically that both original targets were beyond his reach. Over Pirmasens, with a thick blanket of ground mist obscuring any possible targets north of that town, he decided to bomb the most convenient target. Thus ill-defended Pirmasens, maker of army boots, received the explosives and incendiaries of eight DH4s. 'A very quiet journey,' Fox reported, 'no trouble being experienced with either A.A. or E.A.' He experienced a less pleasant and more exciting time on 10 March when, at 4000 feet, he accidentally knocked the compensator open and the exhaust ignited the gasoline vapour in the pilot's compartment. Though his clothes were on fire and he himself was slightly burnt, he managed to crash-land on the allied side of the line. He and his observer escaped from the wreckage.¹⁸

With the beginning of March the pace of VIII Brigade's operations picked up, but once the great German ground offensive of that month began,* its priorities were radically changed. As early as December Trenchard had heard rumours of an impending offensive and when the storm broke he wrote directly to Newall authorizing a withdrawal to Tours, on the Loire, should the need arise. Since the main German thrust did not affect the Nancy sector, VIII Brigade stayed where it was, although 100 Squadron was redeployed from Ochey to Villeseneux, closer to the front, from 29 March to 10 May. Between 23 March and 16 May the brigade flew more than two hundred bombing sorties, almost all of them in support of the ground armies, particularly against railways. This reversed previous priorities when the bulk of bombing had been directed against industrial targets.[†] It was during this period that 100 Squadron carried out one of its more spectacular raids. On the night of 24-25 March it sent 14 FE2bs against the Metz-Sablon rail triangle, Lieutenants L.A. Naylor of Winnipeg and G.E. Lucas of Sarnia manning two of them as observers.¹⁹ The squadron dropped sixty-nine bombs on or near its objective. The German report stated: 'Several bombs fell on the main No. 6 track in the station. 15 trucks caught fire and seven munition wagons amongst them exploded, tracks No. 6 and 16 were very extensively damaged, and others also suffered (20 in all). The whole train exploded, blew up and burnt itself out. Seven houses were very seriously damaged. The Northerly gasometer in the triangle was struck and damaged. The force of the explosion was so great that the building South of the

* See chapter 16.

† Railway bombings might be considered dual purpose raids, since they served the strategic aim of inhibiting the flow of coal and steel from Lorraine to the German interior as well as the operational purpose of interfering with the movement of troops and material to the front. However, during the period of the Ludendorff offensives the pattern of rail bombing, directed as it was against rail centres close at hand, such as Juniville, Beltenville, and Amagne-Lucquy, strongly suggests that the prime consideration was the interdiction of the flow of men and material to the front. Another prime target of a purely military nature was the German HQ at Spa, which 55 Squadron tried unsuccessfully to destroy in three raids. H.A. Jones, *The War in the Air: being the Story of the Part played in the Great War by the Royal Air Force, Appendices* (London 1937), app. XIII, 42 ff.

gasometer had its roof blown off and exploding shells damaged the machinery ... Only 6 men killed and 2 wounded.²⁰ All the raiding machines returned safely.

Once the crisis of the offensive was over, VIII Brigade returned to its prime mission. On 16 May 55 Squadron resumed the attack upon German industry by raiding Saarbrücken. A number of Canadians took part in this raid, including two who had no previous experience of industrial attacks, Second Lieutenant W.I. Parke of Vancouver, a probationary observer who had come to the squadron less than a month before, and Second Lieutenant W.J. Pace of Edmonton, a pilot who had taken some part in raids during the Ludendorff offensives. On their way to the objective the DH4 crews could see enemy scouts rising towards their height of 13,000 feet. As they bombed their target, causing sixty casualties and damage to workshops, trains, and signal apparatus, the German fighters closed in. A DH4 fell in flames over the city, and as the formation turned awkwardly for home, three more observers were wounded, including Parke. Pace's observer reported that he had counted more than twenty Albatros at one point during the running fight back to the lines. After the machines had landed it was found that several had been so shredded by machine-gun fire that they were unserviceable.²¹

The rise in enemy air activity experienced by 55 Squadron was an omen of things to come. Night raiders were meeting no such resistance. Thus on the night of 21-22 May 100 Squadron sent fourteen aircraft against Saarbrücken and Thionville. Though three force-landed within the lines, the remainder, whose crews included Second Lieutenant F.R. Johnson, a pilot from Westmount, Que., and three Canadian observers, Lucas, Naylor, and R.C. Pitman of Saskatoon, Sask., obtained direct hits on railway installations at Saarbrücken, causing some dislocation of traffic and twenty-four casualties in the barracks there.²²

On 21 May VIII Brigade's original squadrons were joined for the first time by 99 Squadron, which attacked Metz-Sablon. Formed as a day-bombing unit at Yatesbury, Wiltshire, in August 1917, the squadron arrived in VIII Brigade's area from England on 3 May and since that date had been completing its training and familiarization.* Not only was this a totally inexperienced unit (though of course its senior members had had service with other squadrons), but it was the first assigned to the brigade to be equipped with the new DH9 bomber. This aircraft was the outcome of the Cabinet's decision on 2 July 1917 to enlarge greatly the bomber strength of the RFC and to produce a bomber with greater range than the DH4. De Havilland was responsible for the redesign of the airframe, but every-

* When it arrived in France the squadron contained ten Canadians (roughly one-quarter of the aircrew establishment); seventeen more joined it during the ensuing months. Nine of the originals were pilots: S. McB. Black of Springfield, Ont. (POW 31 July 1918), C.C. Conover of Leamington, Ont., E.L. Doidge of Vancouver (KIA 31 July 1918), N.S. Harper of Kamloops, BC (KIA 25 June 1918), D.A. Macdonald of Saint John, NB, K.D. Marshall of Tara, Ont., W.G. Stevenson of Toronto, C.A. Vick of Montreal, and H.D. West of Toronto. The lone observer was D.G. Benson of Aylmer West, Ont. (KIA 25 June 1918). Subsequent members during the squadron's operational life were E.C. Clark of Regina (KIA 13 Aug. 1918), N.W. Davidson of Westmount, Que., M.A. Dunn of Bobcaygeon, Ont. (POW 7 Sept. 1918), J.H. Hall of Toronto, H.H.R. Hanford of Fort William, Ont., J.L. Hunter of Walkerville, Ont., G.W. Irving of Gretna, Man., W.H.R. Jarvis of Fort William, Ont., W.C. Jeffries and W.T. Jones of Toronto, C. Lambe of Saskatoon, Sask., H.C. Peat of Winnipeg, and M.J. Poulton of Toronto.

thing depended upon the success of the Beardmore-Halford-Pullinger (BHP) engine contracted for by the Air Board. If this produced less than the desired 300 hp, then it would be inferior to the 275-hp Rolls-Royce engine of the DH4. As early as August 1917 Trenchard began to express grave doubts about this aircraft, already suspecting that its performance would not be up to that of the DH4.²³

He was right. The BHP engines yielded only 230 hp and the aircraft with bomb-load could barely struggle to 15,000 feet, 7000 feet below the service ceiling of the DH4. Its bomb-load was no greater and its endurance was only marginally better than that of the DH4. Moreover, the new engine was failure-prone. During its service with the Independent Force, of a total of 848 attempted sorties by individual aircraft no fewer than 123 had to return with engine trouble, a 14 per cent failure rate.²⁴

Despite its inexperience and its questionable engines, 99 Squadron, having received its baptism of fire, was given no special treatment by Newall. On 24 May the Thyssen blast furnaces at Hagendingen were its target. Six of the fourteen DH9s that took off were flown by Canadians – Macdonald, Doidge, Black, Stevenson, Marshall, and West. Only eight reached the target area, where they were attacked by the same number of Albatros scouts. Doidge's observer, along with one of his colleagues in another DH9, jointly claimed an Albatros shot down. In the scuffle over the target two other observers were wounded, and in the confusion of it all the green crews neglected to make estimates of bombing results.²⁵

Three days later the first aircraft to be lost to enemy action by 99 Squadron was flown by a Canadian, Lieutenant Donald A. Macdonald of Saint John,²⁶ whose diary tersely sums up his experience: 'Left ground at 10 a.m. for raid on Bensdorf. Met 5 Huns. Only 4 in our formation & I was out of luck for a position. Got out of formation after dropping bombs & had my tail plane shot off on left side. Loop & spin ... Landed one mile from lines. Oh! What a feeling. For duration now.'²⁷ For Macdonald and his British observer a long confinement at Stralsund POW camp lay ahead.

As these early raids show, the DH9 engines were already proving a headache. On 29 May twelve aircraft set out for Metz-Sablon, with Doidge, West, Marshall, Stevenson, and Black among the pilots. Half their number, including the machines flown by West and Black, had to return prematurely with engine trouble. Despite hot and hard work in the target area, Doidge and two other pilots were able to provide some estimate of results, an indication that the squadron was gaining competence.²⁸

On 21 May another DH9 squadron, No 104, had arrived. Formed in England in November 1917, the squadron's service was marked by bad luck and heavy casualties. These began immediately. Arriving late at night at Azelot, having flown for hours in darkness over unfamiliar terrain, two of the squadron's machines crashed on landing. On 27 May Lieutenant William Bruce of Plenty, Sask., and his British observer went missing while ferrying another DH9 from England.* The squadron

* There were ten Canadians with 104 Squadron when it joined VIII Brigade: P.E. Appleby of North Sydney, NS, J.E. Belford of Toronto, George Beveridge of Westmount, Que., J.B. Home-Hay of Wadena, Sask. (POW 22 Aug. 1918), H.A.B. Jackson of Victoria (POW 25 June 1918), E.A. McKay of Toronto (POW 22 Aug. 1918), A. Moore of Treherne, Man., C.G. Pickard of Exeter,

did not fly its first mission until 8 June, by which time VIII Brigade had become the Independent Air Force under General Trenchard's command.²⁹

In its 231 days as an independent formation, 41 Wing and its successor, VIII Brigade, carried out 110 bombing raids in steadily mounting activity.* About two-thirds of all missions flown were in daylight, yet the night losses were proportionally heavier, a factor that came to be reversed in the months ahead. In this early period German defences were not yet of high quality and the major risks were the usual hazards of night flying.

Faulty navigation, especially at night, was an important cause of casualties. Navigational training in the RFC largely consisted of map reading, adequate for the needs of reconnaissance, fighter, and tactical bomber pilots but insufficient preparation for round-trip flights of more than two hundred miles. Even following the advent of longer-range two-seater aircraft, navigational training was not significantly increased. Separate schools for observers were not introduced until 1918, and then the chief emphasis was still placed upon gunnery, photography, and radio telegraphy. It is true that airmen who survived long enough often became accomplished map readers, but even for them the difficulties of using the large maps needed for longer raids in the cramped conditions of open windswept cockpits were formidable. A protracted period of flying in or over cloud almost invariably resulted in the crew becoming seriously lost. In such circumstances, simple dead reckoning was used, based upon the wind prediction given to crews by meteorologists before the flight began, adjusted later by whatever estimates of wind direction and velocity the crew was able to make in the air.³⁰

Since many day-bomber crews went astray using map reading and dead reckoning, it might be expected that those who flew at night over blacked-out towns and the persistent European night mists would be worse off. Yet night crews achieved remarkable standards of navigation. Captain W.A. Leslie of Toronto recalled that 'it was not nearly as difficult as you might think,' at least in FE2bs, since these aircraft, with bomb-load, flew at heights below 5000 feet and normally bombed from 1000 feet or less. At such heights roads, villages, and waterways were discernible to the experienced night flyer, especially since an airspeed of 70 mph gave ample time to pick up landmarks. Moreover, Leslie pointed out, many of the targets, such as Metz-Sablon, Thionville, Boulay, and Frescaty, were raided repeatedly. The aircrews became thoroughly familiar with the night landscape along the way. Night flyers relied heavily, as well, upon the allied system of 'light-houses,' beacons which flashed identifying letters in morse code. Leslie con-

Ont. (KIA 22 Aug. 1918), T.M. Steele of Stratford, Ont. (POW 28 Sept. 1918), and James Valentine, address unknown (POW 22 Aug. 1918). Others who later served on operations with the squadron included H.D. Arnott of Toronto (KIA 29 Oct. 1918), W.E. Bottrill of Hamilton, E.C. Clarke of Regina (KIA 13 Aug. 1918), E.A. Forbes of Westmount, Que., W.H. Goodale of Wadena, Sask. (KIA 1 Aug. 1918), W.B. Henderson of Toronto, J.L. Hunter of Walkerville, Ont., W.T. Jones and O.L. Malcolm of Toronto (KIA 26 Sept. 1918), B.F. Ross of Grimsby, Ont., and J.C. Uhlman of Carleton, NS.

* The official British history states that only fifty-seven raids occurred during this period. This calculation was based upon a target count. Since on many occasions the same target was attacked by different squadrons on the same day, often several hours apart, the present calculation has been made upon a squadron basis.

sidered them 'a great help,' since in good weather they could be seen up to fifty miles away. Once one was identified, a 'fix' could be obtained, since the bearing and distance of each beacon from the home station was known. The Germans had a rather better system, and one which came to be used by RAF crews because the code was not often changed. Batteries in known locations fired colour-coded flares which could be seen even in relatively poor weather, whenever an aircraft was heard overhead.³¹

Immediately prior to Trenchard's assumption of the command of the Independent Force in June there were sixty-two Canadian officers in the five squadrons of VIII Brigade, representing about 30 per cent of its aircrew strength. In all, seventy-three Canadians had taken part in bombing operations and of these only one had been killed, two wounded, and seven made prisoners of war since the inception of 41 Wing, but German resistance during the period was only in process of stiffening. Initially there had been few home defence aircraft to oppose the British bombers. *Kampfgeschwader 2* at Saarbrücken, along with *Kampfstaffel 31* at Trier and *Kampfstaffel 32* at Freiburg in Breisgau, had been assigned to the task of bombing the British aerodromes in the Nancy area. Fighter defence had been left to a single unit based near Mannheim.³²

As British raiding proceeded, however, so did a progressive reform of the German home defence system. A telephone-linked reporting grid monitored the approach of British aircraft and made rational planning for counter-measures possible. An undetermined number of home defence squadrons (*Kampfeinsitzerstaffeln* or *Kests*) was added, though their effectiveness was limited until mid-1918. The bulk of the defence rested with flak gunners and searchlight crews. Around important sites the guns and lights were supplemented by balloon barrages, trailing heavy steel cable nets to discourage bombers from gliding in at low levels. Such obstacles were often effective, but it was only during the period of Independent Force operations that German defence measures began to take a heavy toll.³³

Trenchard did not take formal command of the Independent Force until 6 June, by which time he had already been in France for three weeks. Some of that period was spent working out with Salmond the way in which their commands were to relate to one another.* The terms of reference laid down by General Sykes for the Independent Force gave it a role remote from that of the RAF's main force. The general objective (and Sykes insisted that there must be absolutely no divergence from this aim) was nothing less than 'the demobilization of the German Armies-in-the-Field, by attacking the root industries which supply them with munitions.' Trenchard was not to turn his force to strategic reconnaissance or to attacks upon enemy airfields, railway centres, or transport. These tasks belonged to Salmond's force. Were Trenchard's squadrons to take them up, 'with the very limited force available for independent operations no real progress will be made in the destruction of key industries.' The Independent Force was ordered, in Sykes' phrase, 'to

* Trenchard later described his relations with RAF Headquarters as 'very strained.' 'I found myself writing to Haig for things I wanted and I got peevish letters from RAF HQ saying they were worried by great battles on the Western Front and could not be bothered with my petty requests for bakeries, etc. I do not blame them one little bit, I understood Salmond's point of view exactly.' Trenchard interview with H.A. Jones, 11 April 1934, Air 8/167

obliterate' the German chemical industry, 80 per cent of which could be attacked from Trenchard's bases. Since it was the chemical industry which supplied 'the necessary material for explosives, propellants and poison gas,' Sykes ordered that no other targets should be attacked until the chemical plants were 'completely crippled.' Only if weather were unsuitable was Trenchard permitted to attack, as secondary targets, the steel factories of the Lorraine Basin.³⁴ The new Chief of Staff had little sympathy with those extremists among his officers who believed that the new force, if given the chance, could win the war on its own, but he certainly shared their conviction that essential German industries could be obliterated. From a memorandum he prepared for the War Cabinet in June it is apparent that he did not expect decisive results from bombing until June 1919. Nevertheless, he was adamant that a start be made immediately, even though the Independent Force was badly under strength.³⁵

Apart from establishing an accord with Salmond in the light of these orders, Trenchard had also to face the problem of his relationship to the Allied High Command. At that level the very concept of an 'independent force' was viewed, at best, with wry amusement. *Général Duval*, Deputy Chief of the French General Staff, is said to have asked: 'Independent of what? Of God?' As Trenchard wrote to Sir William Weir: 'It is very difficult to explain on paper the various difficulties which crop up if it is not clearly laid down what I am.' The co-operation of French authorities, from the highest level down to station-masters and municipal officials, was vital because Trenchard was confronted with an immense administrative problem. His concerns about status were not finally laid to rest until October; in the meantime, he found a friend in *Général de Castelnau*, in whose theatre the Independent Force was based.³⁶

When Trenchard began he had five squadrons under command. The three day-bombing squadrons (55, 99, and 104) remained in 41 Wing, while 100 and 216 (Night) Squadrons were transferred to the newly formed 83 Wing. On 3 May he was allotted seven new squadrons, five of DH9s and two of Handley Pages. All were to be fully equipped by 1 June and to arrive by 15 July. Between the latter date and 24 October Trenchard was told to expect another twenty-seven squadrons (twenty DH9s, one DH10, and six Handley Pages). He was ultimately forced to make planning, administrative, and other provision for some thirty-four squadrons. Yet the fact is that by the end of the war he had received only four squadrons in addition to the original five.*³⁷

In June, though suspicious of staff projections, Trenchard had no way of knowing that this astonishing short-fall was to occur. When more French squadrons were moved during June to the Nancy area to meet the needs of the armies at the front, Trenchard pointed out to Castelnau that this buildup was taking up available land in the area allotted to the Independent Force. The problem became more

* With characteristic bluntness and realism Trenchard recalled in 1934 the situation in which he had been placed: 'When I took farewell of the Independent Force just after the war ... I told them that this high-sounding name was all moonshine. What the Independent Force was, was nothing more than the 8th Brigade which had been under my command long before. What I commanded was a few squadrons which represented a tiny part of my original command. In other words I was not anybody much.' Trenchard interview with H.A. Jones, 11 April 1934, Air 8/167

acute in July and August, when American air units were based in the same general region in preparation for the fall offensive. Through adamant insistence upon his own requirements, Trenchard was ultimately able to expand the Independent Force's territorial boundaries.³⁸

The ground support organization required to keep an air force flying was – and has remained – very large, and the Independent Force was no exception to this rule. To service and fly the five squadrons in the force in June, there was an establishment of 1342 all ranks. Since the force was independent, and a substantial expansion was expected, there was in addition a huge headquarters and supporting group. A strength return of 25 May showed 9181 all ranks in these categories.* Among this group were the medical service staff of No 8 Canadian Stationary Hospital (183 all ranks), as well as a labour force of 2838 East Indian troops and 2869 prisoners of war, which was required primarily for the construction of air fields and necessary installations. As Trenchard pressed vigorously on with his expansion programme three Canadian Forestry Companies, Nos 9, 10, and 11, were added in August, numbering about 510 all ranks.† To keep his force supplied, Trenchard had to organize transport to move an average of 165 carloads of stores weekly over the already heavily burdened French rail system. Whatever its shortcomings as an operational formation, the Independent Force was a solid administrative success.³⁹

No attempt will be made here to offer a detailed narrative of Independent Force raids during the period of Trenchard's command. Inevitably raids tended to be repetitive in character, though for the men who flew them no single one was routine. Squadron and wing records were concise documents, in which the minimum of information about objective, aircraft, weight of bombs dropped, estimate of results, and presence of hostile aircraft was recorded in the space provided on printed forms. Squadron commanders only infrequently enlarged upon such details. Nor was there a substantial flow of correspondence between the Independent Force staff and the Air Staff in London. Instead, Trenchard chose to report directly to Weir on a monthly basis. Sykes' staff chafed over this situation, but the Chief of Air Staff did not elect to assert his authority. As a result, the Air Staff got its information about the manner in which the Independent Force was carrying out its orders chiefly from Trenchard's summaries to Weir, from Independent Force *communiqués*, and from periodic 'approximate results' reports. Not infrequently there were discrepancies in these documents.

Trenchard, then, was left largely to run his own show; his force was independent in more than one respect. Staff memoranda complaining of this situation, and pointing out not only inconsistencies but also, and more important, radical departures from orders, seem never to have got farther than General Sykes. The historian is confronted by the same problem which confused the Air Staff. For example, Trenchard's monthly totals of bomb tonnage dropped do not appear to

* This figure excludes Trenchard's personal staff of twenty-six.

† The foresters were sent to Nancy without tractors. Instead, they were provided with three hundred horses 'which are blind or otherwise unfit for ordinary work.' War Office to Secretary Canadian Forces in Britain, 16 Aug. 1918, War Office to C-in-C BEF, 24 Aug. 1918, Air 1/521/16/12/4

tally with totals obtained by adding those of individual squadrons. Similarly, there are occasional clashes between Trenchard's monthly reports of squadron objectives and those which appear in daily squadron returns. Finally, it is difficult to determine precisely what both the Independent Force and the Air Staff meant by a raid. 'Raids' seem to have been defined by the target actually bombed, or thought to have been bombed, rather than in terms of operations conducted by formations against predetermined objectives. Thus, if squadron aircraft were forced, for whatever reason, to bomb targets other than the stated objective itself, each of these forays seems to have been recorded as a raid. For all these reasons, statistical analysis of the operations of the Independent Force can only be approximate, resting as it must upon figures of an arbitrary nature.

From the beginning, it is clear, General Trenchard did not follow closely the orders he received. On the basis of a subsequent analysis by the Air Staff it appears that seventy-seven raids took place in June, during which almost sixty tons of bombs were dropped, a substantial increase over the May tonnage. Only 14 per cent of these raids were directed against the German chemical industry, the primary objective laid down by Sykes. A further 13 per cent were flown against the secondary objective, the iron and steel industry. The remainder were against targets Trenchard had been specifically told to ignore. More than half of all raids, forty-three in all, were against the enemy railway network and most of these targets were within seventy-five miles flying distance of Nancy. Another 13 per cent were against enemy aerodromes and the rest against such targets as motor transport parks and barracks. In sum, Trenchard had devoted almost three-quarters of the Independent Force's first month of operations to targets of a non-strategic nature.⁴⁰

In a brief covering letter to his first month's report, Trenchard explained his course of action to Lord Weir. He had planned, he wrote, to inaugurate the air offensive by attacks upon a large number of scattered objectives in order to disperse German defence forces and to follow this initial phase by concentrated assaults upon a single target. Adverse weather had frustrated his intentions, but even had it not, the task of training new squadrons and inexperienced pilots dictated the selection of 'easy objectives.' Another inhibiting factor was 'the large number of failures in the BHP Engine' of the DH9s; moreover, 'the range of these machines, even with a 5 mph wind, was not sufficient to reach objectives such as COLOGNE, FRANKFORT, or even COBLENZ or MANNHEIM with any degree of regularity.'⁴¹

A review of squadron operations bears out the explanation he offered to Weir. Thus the inexperienced 99 Squadron occupied itself from 6 to 8 June with raids upon a target close at hand, the Thionville rail complex. The BHP engines gave repeated trouble. On 6 June six of eleven DH9s returned to base with engine failures of various kinds. 'The next day's work,' the squadron history noted, 'was even more depressing.' Only four of twelve aircraft completed the assigned mission; the rest returned with engine problems or because green pilots 'failed to get together owing to misunderstanding as to formation places.' On 8 June four aircraft returned with their bomb-loads, two having suffered ignition trouble, another with a magneto failure, while the fourth 'would not give satisfactory results at a

height.' Only on 9 June was the squadron allowed to attack its 'first target in Germany proper,' the steel works and blast furnaces at Dillingen in the Saar Valley; it was confidently asserted that 'excellent results were obtained.' On the other hand, the far more experienced night bombers of 100 Squadron attacked blast furnaces at Maizères on the night of 6-7 June, a raid in which Second Lieutenant J.A. Chambers of Winnipeg and Lieutenant G.E. Lucas of Sarnia, Ont., an observer, participated. On 13 June, however, the spell of fine weather broke. Not until the last week of the month was Trenchard again able to mount a series of raids.⁴²

Attacks resumed on 23-24 June with 100 Squadron's raid on the Metz-Sablon railway triangle. Judging by the wide assortment of targets attacked, Trenchard's aim in this period seems chiefly to have been the maintenance of offensive pressure so far as weather and material permitted. Thus the three day squadrons launched attacks on 24 June, and after a break because of rain during the night, new raids were made at dawn the next day. No 55 squadron attacked the factories and railyards of Saarbrücken and was itself attacked over the objective by nine German aircraft. Second Lieutenant G.A. Sweet of Hamilton, Ont., together with his observer, was killed during this combat. The two DH9 squadrons were also in action. Though bedevilled as usual by engine failures, 99 Squadron sought to bomb Offenburg station and railway sidings, some forty-five miles over the lines, but just as its aircraft were releasing their bombs they were jumped by seven enemy scouts. Their bombs scattered ineffectually, and Lieutenant N.S. Harper of Kamloops, BC, and his observer, Second Lieutenant D.G. Benson of Aylmer West, Ont., 'last seen going down under control in the Rhine Valley,' were killed. No 104 Squadron, bound for Karlsruhe, seventy-five miles over the lines, had five of twelve aircraft return with engine trouble. The remainder, led by the seasoned pilot Captain J.B. Home-Hay, a former farmer from Wadena, Sask., successfully bombed the munitions factory at Karlsruhe causing, according to later intelligence, some three hundred casualties. Home-Hay shepherded his formation back to base despite the hounding tactics of enemy scouts, but at the cost of a second DH9 shot down and two pilots and an observer wounded.⁴³

That same night the Handley Pages of 216 Squadron attacked Metz-Sablon, claiming 'good shooting.' Meanwhile, 100 Squadron carried on a private war it had begun some time before with the German bombing force based at Boulay aerodrome. The raid was typical of the many assaults the squadron had made, and was to make, upon Boulay. Fifteen FE2bs left the ground just after midnight. Among the pilots were Chambers and Lieutenant D.L. Hobson of Mount Elgin, Ont.; the observers included Lucas and Naylor. Because of cloud conditions four aircraft went astray, but the rest found the target after the leader managed to illuminate it by dropping two 40-lb phosphorous bombs from 1200 feet.⁴⁴ According to the squadron's report: 'A number of hangars seem to have received direct hits, the remaining bombs bursting close to and wide of the hangars. Two phosphorous bombs caused a large fire to the north of road not far from the hangars, which was still burning when the last pilot left. The buildings to the West of the hangars received direct hits with 25-lb bombs. Nearly 3,000 rounds were fired into the hangars and into the buildings on the West side. No activity and no machines were

observed on the aerodrome.¹⁴⁵ Evidence from German sources bears this out. Unfortunately, burning hangars do not necessarily mean burning aircraft; while four hangars containing stores were burnt out and had to be rebuilt, no aircraft were destroyed.* Altogether, the squadron dropped 18.5 tons of bombs on Boulay, and by the end of August photographs showed that twelve of its twenty-two hangars had sustained 'appreciable damage'.¹⁴⁶ The concentrated use of one of his squadrons in this fashion is a measure of the threat Trenchard believed that German bombing forces posed to his own activities, as well as to the armies. He therefore persisted in ordering such attacks, both on Boulay and many other aerodromes, though little concrete evidence was forthcoming to show either that significant damage was being inflicted or that the German bombing effort was being usefully impeded.

German fighters and flying accidents hurt the Independent Force more than the enemy bombers ever did. In June the force claimed to have shot down ten enemy scouts and to have 'driven down' ten more. It lost nine of its own aircraft to enemy action and a further twenty-four wrecked in various accidents.¹⁴⁷ Of the sixty-one Canadian airmen who served with the Force during June, six, all with day squadrons, were casualties, five of them in DH9s.

In July, despite less favourable weather than the previous month, the Independent Force stepped up its tonnage dropped to eighty-eight tons in 116 raids. What was most significant about the month's operations was that the pattern established in June remained the same. Only 18.5 per cent of all raids were against the chemical and steel industries to which Sykes had attached such high importance; all the rest, including 46 per cent against the railways and 28 per cent against aerodromes, were against objectives either outside Trenchard's terms of reference or given a low priority by the Air Staff. In his report to Lord Weir, Trenchard made no effort to excuse his breach of orders. Instead, he set down plainly the extent to which his operations had been dovetailed to the needs of ground forces. For instance, at the request of the French GHQ, he had ordered the railway station at Lumes attacked on two nights. Similarly, night reconnaissance was being carried out 'systematically over the Railway System in the LORRAINE area ... at the special request of the General Officer Commanding the Group of Armies of the East'.¹⁴⁸

As German home defences improved, daylight raiding was becoming more and more costly to the Independent Force. Sixteen machines were lost to enemy action, as well as forty-one from other causes, and the bulk of the losses were DH9s. Increasing numbers of Pfalz and Albatros fighters, and even the occasional Fokker (probably from front-line squadrons since so many of Trenchard's raids took place relatively close to the lines) were being encountered by the day squadrons. The month got off to a bad start with a raid by nine DH9s of 104 Squadron on the railway station and sidings at Karthaus. The formation leader, Captain E.A.

* Trenchard's report identifies the target as 'Bolchen' aerodrome. Air 1/2000/204/273/275; cf 'Operations of 100 Sqn,' 23-24 June 1918, Air 1/721/48/2. This is one of the rare occasions on which bombing reports can be checked against German information. Although the Independent Force attempted to secure photographic evidence of the results of bombing, it did not do so in the systematic manner of the Second World War, nor was assessment of photographs made with consistent rigour. Aircrew reports tended to be accepted uncritically, yet, when evidence exists to check them, they prove to have been, on the whole, over-optimistic.

McKay of Toronto, lost three of his aircraft immediately, one crashing on take-off, another force-landing with engine trouble, and a third limping back to base from the same cause. Shortly after McKay led his formation across the lines at Verdun, a DH9 lost power, dropped out of the formation, and was last seen gliding down towards the ground. McKay pressed on, but when yet another machine was forced down by two enemy scouts, he decided to turn aside from the objective and attack the railway triangle at Metz-Sablon instead. Constantly harassed by enemy scouts, the four DH9s fought their way to the new target, only to encounter an additional twelve German aircraft over it, one of which was shot down by the Canadian observer Second Lieutenant P.E. Appleby of North Sydney, NS. The four survivors then recrossed the lines without further mishap. On 7 July 99 Squadron had better luck. Returning from a raid on Kaiserslautern, six of its DH9s were attacked by eight to ten enemy scouts. In the running fight which ensued, Lieutenant William G. Stevenson of Toronto assumed command following the loss of the flight leader and distinguished himself for his steady handling of the situation, bringing the remainder of the squadron safely back.^{*49}

By comparison, the night squadrons were relatively unscathed during the month. One of their most successful operations was that undertaken by 100 Squadron on the night of 16–17 July, the Canadians Naylor and Second Lieutenant F.R. Johnson of Montreal taking part. The Hagendingen steel works were hit hard. Photographs taken the next day showed that the central blowing station had received a direct hit and that a workshop next to the rolling mills had been destroyed. German reports confirmed this, giving casualties to workers at the plant as eight killed and fourteen wounded.⁵⁰

The month ended as it had begun, with a disastrous raid. This time it was 99 Squadron's turn. By now the squadron had become much more proficient at formation keeping, but German tactics were developing rapidly. Six or more fast Albatros or Fokker fighters would manoeuvre above the bomber formation, while 'two or three machines concentrated on a single DH9 from below at very close range.' On this occasion the formation leader decided that it was hopeless, in face of such odds, to try to reach Mainz, and so diverted his aircraft to Saarbrücken. Before the new objective could be reached, four DH9s had been shot down. Three more were lost in the running fight on the homeward leg. In all, the squadron lost fourteen airmen. Among them were Lieutenant E.L. Doidge of Vancouver, commanding 'A' flight at the time, who was killed, and Lieutenant S. McB. Black of Springfield, Ont., who was taken prisoner. These heavy losses crippled 99 Squad-

* For his leadership, skill, and gallantry, this veteran of twenty-six raids received the DFC. Stevenson had had an interesting history. Born in North Bay, he moved with his family to Toronto, where his father became a police constable. After attending the city's public schools, young Stevenson took a job at the Toronto filtration plant. He managed to put together the money to buy himself thirty-three minutes of flying time at the Toronto Curtiss School, but when he applied in Ottawa to join the RNAS, Admiral Kingsmill judged that he lacked the education to become a probationary flight sub-lieutenant. He and another Canadian in similar case were sent overseas as chief petty officers, 3rd grade, and were rejected by the Admiralty, which was no longer accepting 'men' as pilots. Returned to Canada in March 1916, Stevenson was not taken on strength by the RFC until December 1917.

ron for some time, until new pilots and observers could be trained in formation flying. It is small wonder that the squadron's history noted a 'feeling of despondence' among the survivors. The DH9 was an extremely vulnerable machine.*⁵¹

The reinforcements for the Independent Force which arrived in August were therefore doubly welcome, since both 97 Squadron and 215 Squadron were equipped with Handley Page 0/400s. Of the fourteen Canadians who served with 97 Squadron during its period of operations (it had had no previous operational experience), six were already with it when the squadron joined the Independent Force on 9 August.[†] Nine Canadians were with 215 Squadron during its service under Trenchard; the squadron, as part of 5 (Naval) Wing, had taken part in night bombing operations as early as April in the attempt to block Zeebrugge.[‡]⁵²

The appearance of these two squadrons shifted the balance of the force towards night operations and the addition of the Handley Page 0/400 was itself a notable improvement in the capacity of the force. The 0/400 was superior to the 0/100 (which 216 Squadron continued to fly) in a number of respects. It had an improved fuel system, better engines (the twin Eagle VIIIs made it slightly faster), and a higher service ceiling of 8500 feet. Its new bombracks permitted it to carry varied bomb-loads, from sixteen 112-lb bombs to a single 1650-lb bomb.⁵³

The advent of these two squadrons was partly responsible for the general increase in the activities of the Independent Force. Over a hundred tons of bombs were dropped in August, a proportion upon long-range targets such as Düren, Frankfurt, Darmstadt, Coblenz, Karlsruhe, and Mannheim by day, and Cologne and Frankfurt at night. The number of actual raids, however, dropped to eighty-eight. Of these, only 15 per cent were upon the chemical and steel industries, the least attention the Independent Force had given thus far to what were, after all, its major objectives. Of the remaining raids, almost 50 per cent were against

* In his report to Weir, Trenchard drew attention particularly to difficulties experienced with broken inlet valve springs on its BHP engine. Consequently, 'Formations of these machines, not infrequently, were reduced owing to this trouble to three or even two machines before the Lines were crossed.' Another major source of trouble was cracked cylinder heads; indeed, one machine had been forced back because of this malfunction on the fateful raid of 31 July. The design requirement which placed the radiator under the fuselage increased the size of the target vulnerable to attackers from behind and below by at least one-third. Beyond everything else was the fact that the engine simply did not develop enough power to enable the DH9s to fly high enough, fast enough, or far enough either to evade at least a proportion of the enemy's fighters or to render them efficient for the purposes of long-range bombing. Report on Independent Force operations during July 1918, 1 Aug. 1918, Air 1/2000/204/273/275

† The six were C.F. David of Killarney, Man., L.R. McKenna of Ottawa, G.T. Reid of Toronto, J.A. Stewart of Montreal, P.D. Taylor and G.L. Warner, both of Vancouver. Later reinforcements were H.S. Boocock and J.J. Campbell, addresses unknown, F.M. Dunlop of Richmond Hill, Ont., R.A. Gunther of London, Ont., G.L. MacPherson of Toronto, D.B. McColl of Walkerville, Ont., P.B.O.L.B. Morency of Quebec City, and F.R. Orris of Springfield, Ont.

‡ They were W.E. Crombie, address unknown (KIA 31 Aug. 1918), Frank R. Johnson of Westmount, Que., W.B. Lawson of Barrie, Ont., J. Lorimer, address unknown, H.B. Monaghan of Picton, Ont. (POW 17 Sept. 1918), and M.C. Purvis of Toronto (all of whom were with the squadron when it came to the Independent Force); J.S. Ferguson, address unknown, S.J. Goodfellow of Toronto (POW 30 Oct. 1918), and A. Tapping of Revelstoke, BC (POW 15 Sept. 1918), who joined it later.

airfields* and another 31 per cent on various railway targets. What prompted this extraordinary concentration upon the German bomber bases? Although Trenchard told Weir that 'Up to date the attacks made by the enemy against our aerodromes have been insignificant,' he seemed to be haunted by fear of the damage that German squadrons might do to his own bases. 'It is certain,' he wrote, 'that desperate efforts will be made by the enemy to defeat our object by the destruction of our aerodromes, and a hard-fought bombing battle must be anticipated.' No such bombing duel ever materialized.⁵⁴

Nevertheless, the enemy's battle with the Independent Force continued in the air with mounting intensity. During the month Trenchard estimated that the enemy had increased its home defence force by four squadrons, noting that 'Our formations invariably meet with heavy opposition, and have on several occasions been attacked by 20, 30 and as many as 40 hostile machines.'⁵⁵ It was during one such encounter that 104 Squadron met disaster on 22 August. Just after 0500 hrs on that morning thirteen DH9s left to bomb the *Badische Aniline und Soda Fabrik* (BASF) chemical works at Mannheim. The first formation of seven machines (including one spare) was led by Home-Hay. The second formation of six machines was led by another Canadian veteran, Captain E.A. McKay of Toronto.[†] Initially all went well and the reserve machine turned for home at 0740 hrs, just before the remainder of the squadron crossed the lines at Raon l'Étape.⁵⁶

Then their troubles started. On crossing the lines both formations encountered heavy anti-aircraft fire which destroyed one machine. As soon as the firing let up the crews sighted a formation of eight enemy scouts. A few shots were exchanged at long range, serving to keep the scouts at bay, though they continued to hover at the flanks and rear of the British formation, waiting for stragglers. They did not have long to wait before another Canadian, Lieutenant J. Valentine, firing a green signal flare to indicate that his temperamental BHP engine had failed him, began to lose altitude. The enemy scouts pounced on him but despite their harassment during the long and harrowing descent, Valentine managed to land his machine under control. Both he and his observer were taken prisoner. Valentine's mishap had drawn off the enemy formation and for the moment at least the squadron flew on unmolested. Over the Forest of Waldeck in the Vosges Mountains, however, Captain McKay developed engine trouble and was forced to land in enemy terri-

* Few crews were presented with the kind of opportunity given to Lieutenant Frederick R. Johnson of Montreal and his British observer, Captain H.B. Wilson. Returning from a raid by 100 Squadron upon Bühl, Boulay, and Friesdorf aerodromes on the night of 15-16 August, and with Friesdorf just slipping behind them, they saw twin exhaust flames sinking below them and realized that a German bomber was dropping towards the flares of Friesdorf. Johnson dove on the aircraft as Wilson opened fire. 'After a burst of about 45 rounds,' they reported, 'the machine crashed alongside the flare path, the searchlight on the ground immediately put its beam on to this machine which was observed to be a total wreck.' No 100 Squadron operations summary, 15-16 Aug. 1918, Air 1/176/15/199/1

† These were two of the most experienced pilots in the squadron, both having been flying operationally since 1916. J.B. Home-Hay (POW 22 Aug. 1918) had already won an MC flying with 53 Squadron as an artillery observer, while E.A. McKay (POW on the same day) had an MC from flying photo reconnaissance missions under fire with 42 Squadron. Both won their DFCs for conspicuous gallantry and outstanding leadership in bombing raids with 104 Squadron.

tory. He and his observer were captured before they could destroy their crippled machine.

Under the leadership of Home-Hay the remainder of the squadron made its approach to Mannheim at 11,500 feet, arriving over the city at 0800 hrs. At the outskirts of the city the hapless DH9s were met by a formation of fifteen Fokker and Pfalz scouts mixed with Halberstadt two-seaters. This time the enemy was more aggressive and during the bombing run itself a fierce battle took place. Despite this sixteen bombs were released (eight 230-lb and eight 112-lb) from which 'seven bursts were observed on the factory' causing four fires. 'A direct hit was also obtained on a large new building immediately south of the BADISCHE ANILINE UND SODA FABRIK works. In addition a fire was caused in a factory on the east side of the river.' What happened next is best told in the words of one of the observers, Lieutenant W.E. Bottrill of Hamilton:

Shortly after the bombs were dropped, I broke the top extractor of my Lewis Gun. The Observer flying with Capt. Home-Hay also had a stoppage or jamb, I noticed him working on his Lewis Gun, while both our guns were out of action an enemy scout (Phalz [sic]) dived at Capt. J.B. Home-Hay's machine. His Observer was still working on his gun. When I had my gun again in working order I immediately opened fire on the Phalz that was attacking Capt. Home-Hay (Leader). The E.A. had hit the leaders [sic] machine which emitted smoke and steam [from the vulnerable exposed radiator] and went down in a wide spiral. As a result of my fire the enemy Phalz caught fire, and his machine lost flying speed and stalled and finally went down vertically, still burning.⁵⁷

In the meantime, the remainder of the squadron had followed Home-Hay's machine down to 6000 feet and in so doing the formation broke up. This was the opportunity which the enemy had hoped to create and the scouts dived in on the scattered machines from all sides. The fight was short but furious, lasting only about ten minutes. In the process another DH9 went into a spin carrying Second Lieutenant C.G. Pickard of Exeter, Ont., and his pilot to their deaths. Home-Hay managed to execute a forced landing with his battered machine behind enemy lines.

Lieutenant Bottrill and his pilot tried to gather the scattered and leaderless formation. Eventually Bottrill was able to signal his pilot's intention by tying a handkerchief to the Scarff mounting of his machine-gun. The survivors quickly rallied around their new leader and turned for home. Order having been restored, the enemy scouts broke off the engagement. The survivors and their five machines landed without further incident at 0930 hrs.* In a little over four hours 104 Squadron had lost seven out of twelve machines and most of its knowledge-

* The reader will note that 104 Squadron took almost three hours to reach its objective and only ninety minutes to return to base. The elapsed time for outward trips was always longer than for the homeward trips, since bombing aircraft had to climb to height (in this case 12,000 feet) and assemble in formation before crossing the lines. No 104's flight to Mannheim was probably lengthened by the running battle with German fighters and the survivors may have been assisted during their return by a following wind. The airline distance from their field at Azelot to Mannheim is 103 miles.

able aviators.⁵⁸ Temporarily it was destroyed as a fighting unit, but in less than a month it was back to full-scale activity.

In striking contrast was 215 Squadron's first night attack on the Badische Works. On 25 August two Handley Pages set out, flown by Captain W.B. Lawson of Barrie, Ont., and Lieutenant M.C. Purvis of Toronto, with two other Canadians in their crews, Lieutenants H.B. Monaghan (a pilot who volunteered to act as gun-layer in Lawson's machine) and W.E. Crombie. A low-level night attack was planned, and the movements of the two aircraft in the target area were carefully co-ordinated in advance. Lawson was to approach Mannheim at 5000 feet, draw enemy fire, and when Purvis arrived, was to 'veer off four miles, shut off our engines, turn and silently glide toward the target ...' It was calculated that a four-mile glide would bring the Handley Page over Mannheim at 1000 feet, the minimum height from which bombing was supposed to take place because of blast effect. The two aircraft made contact over Mannheim according to plan, but Lawson seems to have commenced his glide more than four miles from the target. As Monaghan later recalled, 'the silence was startling with only the whistle of the flying wires and the soft sound of the wind to break the quiet ... I stood on a wooden lattice support with my arms resting on the fuselage gazing at the countryside below, wondering what was in store ahead.' When the Handley Page reached the 1000 foot level, 'to our dismay the huge factory, now in view, was about a half mile further on.' Lawson, Monaghan continued:

... flew steadily ahead, and as we swept over the huge works at 200 feet the full load of bombs crashed dead centre and exploded with a roar. The plane lurched and reared but held together and with full power on and dropping the nose to pick up speed we tore ahead. At this time a most fortunate occurrence took place. Alerted by the noise of our engines the searchlight swung down in our direction lighting up the area like day and outlining two high smokestacks and a church steeple directly in our path which Lawson just missed. Meanwhile I was throwing the Coopers [20-lb bombs] overboard and I remember looking down a long street and seeing, with astonishment, a house topple into the roadway.⁵⁹

Lawson reported that he 'circled round for seven minutes sweeping the various works and searchlights with M.G. fire.' As he left the target area Purvis glided in to 400 feet, again claiming direct hits and 'Enormous damage done.' He then swept the town with 1100 rounds of machine-gun fire. Though German reports show the damage caused to have been somewhat less than that claimed, some of the bombs failing to explode, it was nonetheless true that a division of the works was put out of action for two weeks.⁶⁰

These two raids emphasized what Trenchard already knew only too well: that day bombing was becoming prohibitively expensive in lives and machines and that the balance was swinging in favour of night raiding. As early as July 1917 he had warned that a quarter of future bombing forces would have to be trained and equipped as long-range escorts, and the Air Board itself had predicted in November that stiffening German air defences would probably force a shift to night bombing by the summer of 1918. Accurate though they were, these appreciations

had produced neither the required numbers of night bombers nor aircraft suitable for long-range escort. On 4 August 1918 Trenchard consulted Sykes directly on the escort issue, a step that testified to the importance he attached to the problem.⁶¹ One of Sykes' staff officers, Major Lord Tiverton (serving as FO 3 under the Director of Flying Operations,) argued for larger formations of bombers: 'If the enemy attaches such high importance to the results of our bombardments that he is willing to divert such personnel and material to cover his vulnerable points, and if we increase the strength of our formations in such a way as to enable the bombers not only to hold, but to defeat the hostile fighters, it follows that a constant supply of these enemy machines must flow into the area. As it will not be necessary in these circumstances to divert any of our own fighting machines, the advantage to us is obvious.'⁶² But Trenchard lacked the men and machines for mass attacks. Moreover, the problem of station-keeping in large formations, not to speak of control over them in flight, was insuperable, given the mechanical unreliability of aircraft, the primitive means of intercommunication, and the widely varying flying competence of the pilots.

There was scant sympathy for Trenchard and his problems within the Air Staff by this time. Too many hopes had been disappointed by his obvious lack of enthusiasm for the mission of strategic bombing. The imbalance between raids devoted to the industrial targets favoured by the Air Staff and those upon targets of lesser significance had become so blatant that Brigadier-General P.R.C. Groves, Director of Flying Operations and one of the chief proponents of the obliteration approach, was moved to protest to Sykes. 'I would submit that the policy pursued at present amounts to the diversion of maximum effort against targets of subsidiary importance. Such a dissipation of Air Force is at variance with the policy laid down by the Air Council ... and with the views put forward by you in the declared policy of the Air Staff submitted to the War Cabinet in a printed paper on June 27th.* Moreover, I consider that if the G.O.C., I.F., continues to pursue his present policy it will be difficult to justify the allocation of Air Forces as between the Army, Navy and the Independent Force, in which the War Cabinet has recently concurred.'⁶³ Behind Groves' blunt statement lay feelings of deep frustration on the part of members of the Air Staff. Such feelings were disclosed in a memorandum to Groves by Lord Tiverton, a self-confessed extremist on the subject of strategic bombing.[†]

The person who will offend no one offends everyone and accomplishes nothing. The fate of the new staff will be that of all invertebrates. They will have to give in to a reactionary staff who at least believe in a policy with sufficient zeal to see it carried through. Nor is it very difficult to foresee how this will be brought about. There is an evil report already abroad that

* This document, 'Review of the Air Situation and Strategy for the Information of the Imperial War Cabinet,' is printed in full in General Sykes' *From Many Angles: an Autobiography* (London 1942), 544-58.

† In June Tiverton had volunteered his services as an 'observer-bomber' with the Independent Force, arguing to Groves that 'it would not be a bad thing to have an older man who was a fanatic on the subject.' Memorandum to DFO, 21 June 1918, Air 1/461/15/312/107

the new staff are incapable of giving a virile decision. ... those who disagree with the long distance bombing policy will not be averse to seeing eye to eye with those who look askance at the new staff. This atmosphere will be studiously cultivated ... It may be advisable up to a point to sacrifice personnel, material, policy and personal good name in order to obtain the good will of one officer, but it must be remembered that the good will of many others will be alienated in the process and it therefore logically follows that the success of such policy may be too dearly bought.⁶⁴

Only Weir had the authority to bring Trenchard back to the true path, but his early zeal for the strategic bombing offensive, based as it was upon his own overly-optimistic forecasts to aircraft production, had been much diminished. Trenchard's monthly reports for the period June-October were sometimes addressed to Weir personally and at other times to him through the Secretary of the Air Ministry. These reports were, of course, much more informative and candid than the Independent Force *communiqués* issued for public consumption, and Weir had no reply to Trenchard's repeated references to the inferior quality and inadequate number of aircraft he was receiving.

The Air Staff had little more success in advancing the cause of strategic bombing and of British primacy in it in another conflict of the same period. In May Sykes had drafted a proposal to give Trenchard command of an inter-allied independent bombing force to include French and American as well as British units. Presented to the Supreme War Council in June, the proposal met from Foch almost precisely the same arguments previously employed by Haig and Trenchard when they had attacked the idea of independent air operations. Not until 24 September was agreement reached to establish an Inter-Allied Independent Air Force. Even then the Supreme War Council laid down that the IAI AF was to engage in independent operations only after 'the requirements of battle' had been met; during periods of 'active operations' of the armies its prime function was to supply bombing support for the ground battle. Trenchard was not finally confirmed as its commander until 29 October 1918.⁶⁵

The striking power of the Independent Force reached its maximum in September, when Trenchard received his last reinforcements. No 110 Squadron was equipped with the new DH9As, and since they had been donated by His Serene Highness the Nizam of Hyderabad, the unit became known as the Hyderabad Squadron.⁶⁶ The DH9A was the long-awaited replacement for the DH9, but unfortunately it too had many defects. It used the 12-cylinder American Liberty engine, whose 400 hp made it the most powerful in operational use, but in terms of rated performance the 9A was still not up to the older DH4.

* When 110 Squadron was taken on strength on 31 August, only four Canadians were with it. They were H.V. Brisbin, address unknown (POW 30 Oct. 1918), J.D. Thomson of Winnipeg, N. Wardlaw of Brampton, Ont., and K.B. Wilkinson of Toronto. Later arrivals were D.B. Aitchison of Hamilton, A.P. Cannon of Winnipeg, J.C. Gilchrist, address unknown, S.C. Henderson of Winona, Ont., A.S. Robertson of Pownal, PEI, and W.E. Windover of Petrolia, Ont. (POW 7 Nov. 1918).

BOMBER PERFORMANCE CHARACTERISTICS (NO BOMB-LOAD)⁶⁷

	DH4	DH9	DH9A
speed at 10,000 feet	133.5 mph	114 mph	120 mph
service ceiling	22,000 feet	18,000 feet	19,000 feet
endurance	6¾ hrs	4½ hrs	5¾ hrs

The operational record of the DH9A with the Independent Force was most disappointing and its loss rate exceeded that of both the DH4 and the DH9. Undoubtedly the heavy rate of loss was owing in part to the inexperience of 110 Squadron, which had seventeen of its aircraft shot down and another twenty-eight wrecked during its two months of operations. But the DH9A was not a successful machine.*

The other new squadron was No 115. Though it too was untested, having been formed at Netheravon in April, it was equipped with the far more reliable Handley Pages. The squadron did not have a strong Canadian representation – there were six on strength when it arrived on 31 August, and only three more joined it subsequently – but of this small number one was wounded, two injured, and two taken prisoner within the squadron's first three weeks of operational duty.† On its first raid, against the Metz-Sablon rail complex on the night of 16–17 September, the squadron claimed that six of its aircraft reached the target area and that 'The Station was well plastered with bombs, several fires were started, and a searchlight got a direct hit.' Anti-aircraft fire over the target was heavy and a machine piloted by Lieutenant E.G. Gallagher of Leamington, Ont., was crippled and forced down. Both Gallagher and his observer, Second Lieutenant R.S. Lipsett of Holland, Man., became prisoners of war.⁶⁸

The night-bombing squadrons now outnumbered the day squadrons five to four, and with their superior load-carrying capacity they became the predominant arm of the Independent Force. The force was reorganized into three wings. While 41 Wing consisted of the day-bombing squadrons excluding the DH9As of 110 Squadron, 83 Wing comprised all five of the Handley Page squadrons. With the arrival of 45 Squadron from Italy in September a third wing, No 88, was formed to

* No 110 Squadron was the only IF Squadron to be fully equipped with the DH9A. No 99 Squadron began to replace its DH9s with the DH9A on 4 September, but this programme remained incomplete at the Armistice. It was considered impractical to fly mixed types of aircraft in formation, and therefore 99 Squadron used its new machines operationally on only a few occasions. L.A. Pattinson, *History of 99 Squadron, Independent Force, Royal Air Force, March 1918–November 1918* (Cambridge 1920), 43, 55

† The original Canadians on the squadron were G.A. Firby of Toronto (WIA 21 Sept. 1918), E.G. Gallagher of Leamington, Ont. (POW 17 Sept. 1918), T.E. Greer of Toronto, R.S. Lipsett of Holland, Man. (POW 16 Sept. 1918), J.W. Taylor of Guelph, and R.J. Whitaker of Kenora, Ont. J.A. Bell of Edmonton, J.M. Catto of York Mills, and W. Dougall joined later. Whitaker and Greer were the first members of the squadron to undertake a night flight, on 13 September, but were injured in what the squadron history described as a 'bad crash.' 'History of No. 115 Squadron, Royal Air Force,' nd, Air 1/176/15/206/1

include this unit and 110 Squadron.* The posting of 45 Squadron to the force was a belated and rather inept attempt to solve the escort problem. The Sopwith Camel did not have the endurance to escort bombers. This distinguished squadron took no part in the operations of the Independent Force, though administered by it, and was confined instead to patrols of the front-line area.⁶⁹

During September the Independent Force reached its peak of bombing activity, dropping over 178 tons. The overall pattern of the force's operations during the first ten days of the month remained as before, with the day squadrons encountering heavy resistance. For example, ten DH9s from 104 Squadron attacked the BASF works at Mannheim on 7 September, together with eleven more from 99 Squadron. On both the outward and homeward flights the two squadrons met strong formations of enemy scouts. Second Lieutenant P.E. Appleby, of North Sydney, NS, was credited with having shot down two fighters during this taxing operation, but his squadron lost three, and 99 Squadron another, before the mission was concluded.⁷⁰

On 12 September the operations of the Independent Force were suddenly shifted to the support of an offensive of the American First Army, launched on the Meuse with the intention of pinching off the German salient at St Mihiel. To this offensive 1481 allied aircraft were committed, 'the largest aggregation of air forces that had ever been engaged in one operation on the western front at any time during the entire progress of the war.' All aircraft except the squadrons of the Independent Force were placed directly under American command.⁷¹

Trenchard seems to have played little part in planning this operation, and indeed received only two hours' warning on 12 September that it was about to commence. Nevertheless, during the period from 12 September to the night of 16-17 September the force dropped over sixty-one tons of bombs in support of the Americans. Its principal targets were the railway junctions at Metz-Sablon and Courcelles, as well as a number of enemy aerodromes near the front. On 13 September, beginning at 1210 hrs when Appleby took off with his British pilot, 104 Squadron sent out all its machines against Metz-Sablon in a series of attacks lasting until nearly 1800 hrs. Other Canadians joining in this operation were the observer W.E. Bottrill of Hamilton, Ont., and pilots E.A. Forbes of Westmount, Que., O.L. Malcolm of Toronto, and B.F. Ross of Grimsby, Ont. Again on 14 September both 99 Squadron and 104 Squadron raided Metz-Sablon, Bottrill receiving credit for destroying an enemy fighter. The next day these squadrons once more attacked this familiar objective, while 110 Squadron raided the aerodrome at Bühl. Extremely heavy German resistance was met, and though three enemy scouts were claimed shot down (one by Appleby), 104 Squadron lost three DH9s.⁷²

The involvement of the Independent Force in the highly successful St Mihiel offensive had been at the express desire of Marshal Foch. He then ordered the

* No 45 Squadron, largely Canadian while in Italy, still had six on its strength when it came to the Independent Force. These pilots were J.R. Black of Orillia, Ont., H.H. Crowe of Victoria, A.V. Green of Vancouver, M.R. James of Watford, Ont., G. McIntyre of Montreal, and J.C. McKeever of Listowel, Ont. L.F. Hawley of St Catharines, Ont., and J.C. Williams of Westchester, NS, flew with them before the war ended.

Franco-American forces to launch a further attack in the Verdun-River Suippes sector to cut off enemy troops retreating northward. On 23 September Trenchard was informed that this new offensive would start in three days. Despite the advance warning, the force was unable to play much of a part in these operations because of deteriorating weather conditions. On 26 September, the first day of the offensive, both day and night attacks were carried out against Mezières, Metz-Sablon, Thionville, Ars, Audun-le-Roman, and Frescaty aerodrome. On one of these raids, that by 99 Squadron against Thionville, severe losses were sustained. Ten machines took off for the raid. Engine trouble brought two back early, and another subsequently returned, having lost the formation. The remaining seven pushed on for the objective, but over Metz were attacked by large enemy formations estimated at between thirty and forty aircraft. In order to manoeuvre more freely the DH9s dropped their bombs on Metz. Either over Metz, or on the return flight, five of the seven were shot down. A sixth was destroyed upon landing. Only Lieutenant H.D. West of Toronto, bearing home his dead observer, survived. For the next three days weather grounded Trenchard's squadrons, and operations in support of the Franco-American offensive were not resumed until the end of the month.⁷³

Army operational support did not preclude long-distance bombing. The night of 16-17 September saw the commitment of all night squadrons against Cologne, Frankfurt, Coblenz, and Treves, as well as targets closer at hand. The Handley Pages were hard hit, seven being lost to enemy action and three more crashing on the allied side of the lines. The aircraft piloted by Lieutenant F.R. Johnson of Montreal had just released its bomb-load when one of its two engines quit. Johnson coaxed it another ten miles before being forced to land in a field near Darmstadt. The aircraft's three crew members, including rear gunner Lieutenant R.C. Pitman of Saskatoon, then set off on foot for the Swiss border, only to be captured two days later, hungry, footsore, and exhausted. Lieutenant H.B. Monaghan of Picton, Ont., and his crew were approaching Treves 'when, without warning, there were two deafening explosions on our port side and the port engine ground to a stop.' Monaghan lost control of the aircraft during descent, but their crash-landing was cushioned by telegraph wires. After setting fire to the Handley Page the three set off for neutral Luxembourg, carrying their stores of two tins of sardines and a few chocolate bars, but they were picked up the next day by soldiers with police dogs.⁷⁴

More fortunate were Lieutenant J.A. Stewart of Montreal and his observer, Captain G.T. Reid of Toronto. Their Handley Page was the only one sent out that night by 97 Squadron to reach Frankfurt. Over the target heavy anti-aircraft fire was experienced, but Stewart dove through fire and searchlight beams to 500 feet, at which height Reid released his load of nine 112-lb bombs and four cases of incendiaries. Escaping unscathed, Stewart and Reid reported that many direct hits had been obtained on the railways and adjacent buildings.⁷⁵ A few days later a letter was taken from a German prisoner which told a fuller story: 'G.F. arrived yesterday from Frankfurt and was therefore an eye-witness of the English raid on Sunday. The Opera House and a great part of the splendid street "*Die Zeil*" are a heap of ruins, and 120 were killed.'⁷⁶ If the report was true, then this attack had

caused the heaviest casualties to have been inflicted by the Independent Force during its entire bombing campaign. Both Stewart and Reid were awarded the DFC.*

The matter did not end there, however. On 21 September the *Daily Mail* published an interview with Trenchard in which he used the captured letter to demonstrate the effectiveness of the bombing campaign upon German civilian morale. Within the Air Staff this story aroused a protest on the ground that Trenchard had declared publicly that 'the morale damage is of far greater importance than the material,' and that he was substituting psychological effect for the Air Ministry's policy of physical destruction of German war industry.⁷⁷

The author of this objection was Lieutenant-Colonel J.A.H. Gammell, who had recently joined Lord Tiverton in the Directorate of Flying Operations. Gammell's protest was at least curious. Whatever its public professions, the Air Ministry contained many men who were as anxious to destroy German morale as they were to damage German industry. Such views began at the top. Weir had suggested to Trenchard, according to the latter's biographer, that 'I would like very much if you could start up a really big fire in one of the German towns.' Elaborating, he told Trenchard that 'If I were you, I would not be too exacting as regards accuracy in bombing railway stations in the middle of towns. The German is susceptible to bloodiness, and I would not mind a few accidents due to inaccuracy.'⁷⁸

For his part, General Sykes had no doubt about the psychological value of bombing. In his June memorandum to the War Cabinet he had proposed 'numerous attacks by small forces on all the larger cities of Germany with the object of obtaining the most widespread dislocation of municipal and industrial organization.' He went on to explain that '... the aim of such attacks would be to sow alarm broadcast, set up nervous tension, check output, and generally tend to bring military, financial, and industrial interests into opposition ... The wholesale bombing of densely populated industrial centres would go far to destroy the *moral* of the operatives.'⁷⁹ Gammell, indeed, had to look no further than his own office. In June Tiverton had pointed out to Groves that the 'Baby Incendiary' was ineffective against industrial plants but could be used for 'burning down a town of residential houses.' With characteristic zeal he suggested that they should be used during the daytime, 'when the people are out at work, and perhaps only children left to look after the house.' A special target list of towns containing large concentration of workers' dwellings, 'such dwellings therefore forming a reasonable target,' had been compiled within the directorate, and Gammell had given it his approval.⁸⁰ There can be little doubt that like its German counterpart, the Independent Force was indulging in terror bombing, and that this was both known and approved of by all concerned.

In October the pace of activity for the Independent Force slackened considerably, just over ninety-seven tons of bombs being dropped because of 'extremely

* Neither citation specifically mentioned the Frankfurt raid, but 97 Squadron's historical report states that the decorations were awarded for it, although the report mistakenly identifies Cologne as the target: 'The theatre at the time was crowded and the raid had a great moral effect on the people of Cologne. For this both officers were awarded the DFC.' 'The History of No. 97 Squadron, Royal Air Force,' 14 Jan. 1919, Air 1/176/15/196/1

unfavourable weather conditions' with 'prolonged periods of mist, fog and low cloud.' On nineteen days and twenty-two nights of the month even short-distance raids could not be made. Most of the force's operations continued to be in support of the Franco-American offensive in the Rheims-Verdun sector, with over seventy tons of bombs being dropped on railways at Mezières, Thionville, and Metz-Sablon and upon German aerodromes. In the strategic aspect of its operations the Independent Force achieved some spectacular results with the 1650-lb bomb now being routinely used by the Handley Page squadrons. On the night of 9-10 October, for instance, such a bomb dropped by 216 Squadron struck a powder magazine in the Metz Weise island, causing 1,000,000 marks damage and a fire that burned for four days. On the night of 21-22 October a 1650-lb bomb dropped by 97 Squadron completely demolished a munitions factory at Kaiserslautern, with damage estimated at 500,000 marks. Weisbaden was the recipient of the large bomb two nights later when a Handley Page of 97 Squadron dropped one in the 'middle of town' despite bad visibility, causing forty-nine casualties.⁸¹

Though operations were reduced in October, casualties remained fairly high. During the month the force lost fourteen machines in action and fifty-nine in accidents. Particularly hard hit was 110 Squadron. On 5 October twelve of its DH9As had set out for Cologne, but poor weather and continuous attacks by German fighters forced a diversion to Kaiserslautern and Pirmasens. One of its two formations, led by Captain E. Windover of Petrolia, Ont., lost two machines to enemy action and another in a crash short of its base. The second formation also lost two aircraft.⁸² Even more disastrous was the fate that overtook the squadron on 21 October. Its two formations were led against 'railways and factories near Frankfurt' by Windover and the squadron commander, Major L.G.S. Reynolds. What happened to this inexperienced squadron was graphically set down in the bomb raid report:

Twelve machines left in good formation. Crossed lines at 16,000 ft. Course followed at first about 15° afterwards erratic. Evidently crossed Rhine and ... appeared to have mistaken it for Moselle. Wind must have increased from the West ... After crossing River big bank of cloud encountered, formation then at 17,000 and cloud going much higher. Leader fired Red Light. Formation closed up, Leader went down and all machines followed. Machines got broken up in cloud, Leader appears to have turned, apparently to try and get a gap, other machines over shot him. Two machines climbed and went S.W. until they came out of cloud. 1 machine followed Leader till out of cloud at about 11,000, Leader waved 'Wash out' at about 9,000 ft but continued descending. Two machines which went up again bombed Railways and a Factory and returned to Aerodrome ... Three others including deputy leader of No. 1 Formation came back climbing again. A few E.A. Scouts were met but easily driven off or outdistanced. 1 machine landed at 1730 [hrs] near Toul by the light of a burning dump of American Ammunition which almost immediately commenced to go off. 1 machine landed 1730 [hrs] near Mamey in amongst barbed wire close to lines. Third machine landed near Pierrefitte at 1730 [hrs]. The remaining 7 machines are missing.⁸³

Among the aircrew who returned from this raid were two Toronto pilots, Lieutenants D.B. Aitchison and K.B. Wilkinson. Neither Reynolds nor Windover were

as fortunate, both becoming prisoners of war. According to the squadron's historical report, Windover failed in a desperate attempt to avoid capture when he '... had his petrol tank pierced when close to Coblenz. He landed, and his Observer Lt. Simson kept the Huns off with his gun whilst Capt. Windover attempted to plug the leak in the tank. He was unable to do this and had to take off again and flew until his petrol ran out, when he was compelled to land on the German side.'⁸⁴ As an operational unit the Hyderabad Squadron was finished, and was grounded for the remainder of hostilities.

It could be spared. With the end of the war in sight, the Independent Force wound down its activities and only a few raids were conducted in November. At the same time, however, frantic efforts were made to bomb Berlin before the war ended. It is not clear who was responsible for this push, nor what such a gesture was meant to signify. But on 7 November Major W.R. Read, commander of 216 Squadron, was ordered by Trenchard to take a flight of six Handley Pages to Bohemia, find a suitable landing ground north of Prague, and bomb the German capital. Read used the next three days to select crews and assemble stores. Then, on 10 November, he got new orders. A single machine was to be prepared for what he interpreted as a raid on Berlin direct from France, with a subsequent landing at Prague. Though he had grave doubts that the loaded Handley Page could make such a flight, Read volunteered for it as pilot. The order, however, was cancelled the next morning.⁸⁵

The wish to bomb Berlin originated at Cabinet level, and the idea of a strike against the German capital was entertained until very close to the end of the war. The chosen instrument for this purpose, however, was not one of Trenchard's squadrons in France but another unit under his command and based in England. No 27 Group, with headquarters at Bircham Newton near King's Lynn in Norfolk, had been formed with considerable secrecy at the end of August. Its commander was a Canadian, Colonel R.H. Mulock, whose leadership qualities and organizational skill had long impressed his superiors. Mulock later stated that 'we were known as the 27th Group of the Midland area; however, we never took instructions or had anything to do with Midland area, England, but were an Active Service Unit reporting directly to Trenchard, only hidden and camouflaged in various ways in England.'⁸⁶

No 27 Group was to be equipped with the Handley Page v1500, the British answer to the German giants. In July 1917 both Handley Page and Vickers had been awarded contracts to develop heavy bombers with sufficient range to attack Germany from bases in England. By April 1918 the Handley Page prototype was close enough to the testing stage for the Air Staff to begin planning for its operational use. One of the first decisions taken was that these 'super-bombers' should raid Germany from an airfield in Norfolk. Mulock's recollection was that an English base was decided upon because 'these machines were so large that they could not be operated from France as the railway clearances were not large enough to take spares over.' Though this may have been a factor, the reasons offered by the staff were purely strategic. Mulock did not take any part in planning until after the middle of July, but Lord Weir's authority for the Bircham Newton base was given no later than the beginning of that month. Well before then the staff had founded its planning upon the selection of a Norfolk base. In a paper probably

written in late April Brigadier-General P.R.C. Groves, the Director of Flying Operations, saw a Norfolk base as offering three advantages. It would be 'on the flank of the German position in Flanders,' and aircraft would therefore not have to cross trench lines; it would be 'within easy striking distance' of the German industrial heartland in the Cologne area; and it had 'very salient advantages for an attack on Hamburg, Berlin and Central Germany.'⁸⁷

Target selection for the new British giant preoccupied the staff for some months. Although they were informed, optimistically, that the v1500 would have an endurance of fourteen hours at a cruising speed of 100 mph, with a bomb load of perhaps two tons, the staff made their calculations on the basis of a 1000-mile round trip. A common concern of planners was that neutral Holland lay inconveniently across the direct track to the German heartland. Just over the Dutch frontier were such great industrial cities as Essen (with its Krupp works), Düsseldorf, Krefeld, and Cologne. A number of staff papers were predicated upon the infringement of the neutrality of Holland, either with Dutch collusion or unilaterally, because such an overflight would be both shorter and safer than alternative routes.

Production estimates were that eight aircraft would be available by the beginning of October, thirteen by early November, and forty-two by the end of the year. The weight attached to these figures in operational planning varied with the gullibility of the planner. Those who took a rosy view argued for the 'material' approach to the use of the v1500, and for a concentration upon industrial targets. If as many as twelve Handley Pages were available by early October, and since each giant 'carries roughly the same amount of bombs as would be carried by a squadron of 18 DH9s,' then there were real prospects of causing heavy damage.* If the Norfolk force concentrated upon the Düsseldorf group of industrial towns while Independent Force struck at the Frankfurt group even greater results might be achieved: 'It is ... most attractive to use this independent force in conjunction with the force under General Trenchard's command, for the purpose of obliterating, as soon as possible, root industries. The strength of General Trenchard's command, during this year, if unaided will not be sufficient to accomplish much but if it were aided by this strength the effect would be very marked indeed ...'⁸⁸ This appreciation combined a good deal of wishful thinking mixed with some uncharacteristic realism about the potential of the Independent Force.

Most planners were much less optimistic about the prospects of obtaining v1500s in sufficient quantities to inflict significant material damage before the end of the year, and they therefore argued for the 'moral' use of the new weapon.

* A sample target analysis based on previous bombing results was completed by the staff in June. It indicated that only 23.5 per cent of bombs dropped could be expected to be effective in the selected target area, a finding most discouraging to those who believed in obliteration. Only the inimitable Tiverton was undismayed. 'Putting aside all error curves and coming down to simple arithmetic,' he argued, 'it is a considerable underestimate to suggest that a 230 lb. bomb will obliterate everything within 10 yards of it. Assuming this, however, one could divide an area into squares of 20 yards x 20 yards, with a bomb in the middle of each. Krupp's works and workmen's dwellings would contain 7,744 such squares. It is proposed to drop in one effort 20,000 such bombs ... If Krupp's works are not obliterated by such an attack, then there is something very peculiar about them.' FO 3 to DFO, 21 and 22 June 1918, Air 1/461/15/312/107

Judging by the material results of our bomb attacks in France and by the results obtained by the enemy's raids on London no very effective *material* results could be obtained in a short time by 12 'v' type Handley Page machines. So far as I am able to ascertain 12 of these machines could drop approximately 12 tons in a single attack. At this rate and taking into account that in the present system of high flying attack 75% of effort is wasted, a long series of raids would be necessary to bomb to 'cessation' or 'obliteration' any one of the 'root' industrial groups. On the other hand the moral and political results ... by even six 'v' Type Handley Page machines would be considerable. These results would be of a 'disintegrating' character i.e. they would tend to set the capitalist and the masses against the military power.⁸⁹

This officer therefore gave primacy to Berlin and Hamburg as political targets of the first magnitude and it was this view that gradually became dominant within the Air Staff. The 'material' approach was never lost sight of – as late as 17 August Mulock was given a staff briefing paper on the obliteration of the Westphalian industrial complex – but the slow development of the v1500 meant the gradual abandonment of the staff vision of a master weapon striking crippling blows at German industry. Its best use – and that of all other bombers – was as a weapon of terror. As Colonel Gammell admitted, 'we are in fact attempting to frighten the German people out of the war.'⁹⁰

As the Air Staff began to wrestle with the problem of the best use of the v1500s, Mulock, quite unaware of what was in store for him, was going about his duties as a lieutenant-colonel on the staff of No 5 Group at Dunkirk. At the end of May he was given command of 82 Wing, the group's bomber force. Almost at once orders were received from the Air Ministry that he was to report for other duties. Brigadier-General Lambe, commanding No 5 Group, pressed Vice-Admiral Keyes to block this transfer, because 'it is essential to retain this officer's services.' Mulock, 'an officer of very high ability,' wanted to stay with the group and Lambe thought it 'would be disastrous to move him at this period.' All that Keyes could get was a postponement. He warned Lambe that it was probable that Mulock would have to go 'at an early date' to a more senior appointment.⁹¹

* Scenarios in which the Handley Page v1500 figured as vengeance-dealer and destruction-bringer proved irresistible to the Air Staff. As late as 30 September 1918 a staff paper outlined the virtues of the combined use of incendiary bombs and high explosive on population concentrations. It was estimated that the v1500 could carry 16,000 Baby Incendiaries, and lay down a belt of fire sixty yards wide and 2500 yards long. 'If the target is large the operation may be described as simply a plastering of the locality with a predetermined density of fire nuclei.' Night attacks with incendiaries would produce 'a magnificent spectacle' that would 'engender a spirit of enthusiasm in the attacking personnel.' 'To obtain the maximum strategic, moral and material effect from an attack upon a suitable target such as a town or large works the effect of depositing high explosives closely followed by B.I. Bombs could hardly be improved upon. The results might safely be described as terrific, and no ordinary populace could contemplate with equanimity the possibility of further similar attacks.' Such use of the v1500s would 'bring home to the Hun populace ... a due reward for the approval shown by them of the barbarous acts perpetrated by their Armies on the Western and other fronts.' Before this paper was circulated, the Cabinet had already laid down that the destruction of German towns with incendiaries was to be undertaken only 'as a defensive act of retaliation.' 'Incendiary Operations as a Means of Aerial Warfare,' 30 Sept. 1918, Air 1/461/15/312/111; FO3 to DFO, 18 Sept. 1918, Air 1/461/15/312/107

The Air Ministry had in fact already settled upon Mulock as the commander of the Norfolk striking force, and the Admiralty's intervention served to confirm the estimate that had been made of him. His appointment was deferred only because calamity had befallen the v1500 programme. In May the prototype had made its first flight. Over the next few weeks further test flights took place during which problems were experienced with the control surfaces. Then, in June, the prototype crashed, killing all but one of the six occupants. There was no duplicate prototype. Production of the v1500, which had already begun, was continued, but the first production model would not be available for further testing until the autumn.⁹²

The v1500 had virtually been ordered off the drawing board, and the first, ill-fated machine had been produced in the remarkably short time of six months. It was not quite so large as the Staaken VI, the German giant, its wing span of 126 feet being twelve feet shorter and its weight 700 lbs lighter. Its engines – four Rolls-Royce Eagle VIIIs of 375 hp – were much more powerful and gave it a maximum load of 7500 lbs against the Staaken's 4400, but over extended ranges this advantage disappeared. Though in its final form the v1500 was undoubtedly much better engineered than its German equivalent, the British, as it turned out, had entered the super-bomber competition too late.⁹³

This Mulock could not know. On 18 July he was ordered to report to the Air Ministry and plunged immediately into a series of briefing sessions with the operational planning staff, discussions with senior officers such as Sykes and Groves, and visits to General Trenchard in France. By early August he had won acceptance of his organizational plans for the group, including a promotion policy, normal in operational units, that conflicted with headquarters practice. Though the Deputy Chief of Air Staff would have preferred to exert headquarters control over promotions, he thought it best to accept all Mulock's recommendations, 'in view of the important political effect of the operations of the British Independent Force.'⁹⁴

Nor did Trenchard delay long in imposing his views about the structure and role of the new formation upon the Air Staff. In a forceful letter to Sykes he recommended, in terms that left no room for discussion, that the new group should be an integral part of the Independent Force and that, except for matters of administration (which were to be handled by the Air Ministry), Mulock should deal directly with him. Therefore he had 'delegated to him [Colonel Mulock] a large amount of responsibility on lines which I have laid down ...' Above all, he asserted that 'this organization is based upon my plan of operations, and operation orders will be issued by me.' He went on:

There is, however, one point connected with operations which it is necessary to lay down and lay down very clearly and definitely. That is, it would be a great mistake in policy to use these machines for active operations until such time as I consider we shall get the utmost efficiency out of the machines and have the confidence of the Pilots who carry out the operations.

I fully realize the necessity of starting operations early, and therefore I would press that the organization ... is provided at the earliest moment. If this is done, I hope it will be possible to start work with these machines by October. It may be earlier, but it is useless to be too optimistic.⁹⁵

All was carried out in accordance with Trenchard's wishes. On 29 August authority was given for the formation of No 27 Group, Independent Force, with two wings, Nos 86 and 87, to be based at Bircham Newton. Mulock now took up his new command.⁹⁶

Shuttling between Norfolk and London, Mulock soon found himself immersed in administrative details. As he wrote his parents, 'some of my friends have given me a new name, "The Wanderer." It fits my duties and mode of life very well. I wonder what the end will be, as usual I am tackling something so large that at times it seems almost impossible but I never suffered much from a weak heart and we are driving away at it.' To Lieutenant-Colonel E.B. Gordon, Trenchard's senior staff officer, he was more explicit. 'We are all "full out" up here,' he told him, 'and are just in the throes of trying to get to the bottom of this Home Administration. After Active Service, it is rather a shock to see what one has to go through with over here in order that we may go out to kill Huns.'⁹⁷

By judicious use of his direct access to Trenchard, Mulock was able to cut through most of the bureaucratic snares laid in his path. Pilots and observers experienced in bombing operations, many of them with distinguished records, were obtained from the Independent Force and from General Salmond's command. Training courses for them, and for the navigators, wireless operators, engineers, and gunners who would make up each crew of six, were set in motion. A meteorological staff was assembled at Bircham Newton whose duty it was to make 'accurate weather forecasts for a period of sixteen hours from the time machines started,' using information 'covering a distance of 1,600 miles in a circle from our base.'⁹⁸ Wireless operators and navigators were given special training in the use of the directional wireless equipment being fitted to the v1500. As Mulock later explained: 'To control the operation of these machines, it was necessary to have exceptional Wireless equipment and Meteorological forecasts. The Wireless control was accomplished by cutting-in the Wireless Marconi Station at Chelmsford, which had been shut down by order of the Admiralty at the outbreak of the War - [the] Eiffel Tower in Paris and the large Wireless Station at Lyons. This was the main Wireless control from which code messages were sent to the machines, and by taking back bearings on these stations, the machines with their Directional Radio, could locate themselves without giving their positions away.'⁹⁹ These and a host of other matters were taken care of with Mulock's usual down-to-earth efficiency.

Mulock's chief concern, however, was with the v1500s and the infinite difficulties being encountered in their development. On this crucial subject he communicated with Trenchard every three or four days, as well as seeing him occasionally in London, and he worked closely with Frederick Handley Page and Brigadier-General J.G. Weir (the Air Minister's younger brother), who was the RAF's chief technical officer. On 28 August the first production v1500 had left the Handley Page works and been flown for testing to Martlesham Heath. Problems with the rudder and ailerons, engine placement and radiators plagued the aircraft, so much so that on 20 September Mulock was forced to report that the first machine was unsatisfactory and would have to undergo extensive changes. Meanwhile the second machine, by this time ready for testing, would be 'tied up.' The best esti-

mate he could get was that four v1500s would be ready for service by the end of October.¹⁰⁰

By early October modification and flight testing on the two completed aircraft began to progress more favourably. On the 15th the impatient Trenchard wired: 'Understand v1500 been tested last few days. Send full report of trials.' One of Mulock's crack pilots, Major F.T. Digby, a much-decorated British veteran of 216 Squadron, had been flying the new bomber, and Mulock reported that he found it 'as nice as 0/400 to fly.'¹⁰¹ On receiving this favourable news Trenchard posed the big question to Mulock: 'Urgent your definite views as to whether the v1500 as result of your experience can do the long trip and if so the earliest it can be used. Wire me again when you are going to be at Air Ministry. Important that I talk to you on telephone ...'¹⁰² Mulock's reply was simple: 'Yes, it is possible under favourable weather, with the figures we have at present.' In fact, he had already discussed 'the long trip' with Sykes and Lord Weir on 15 October. Both 'were very anxious that a long-distance trip be made at the earliest possible moment on account of the general conditions prevailing both at the Front and internally in Germany.' When Mulock told them that two v1500s would be ready in two weeks, Weir asked that they 'be put in action at the earliest possible moment,' instead of being used for training purposes. Mulock had therefore selected crews for the two aircraft and ordered the Meteorological Section to begin making forecasts 'for the whole area concerned i.e. NORFOLK and 'X' and NANCY.' What was 'x'? There seems no doubt that it was Berlin. In his letter to Trenchard Mulock argued for a 'Northern route.' A map in Mulock's papers shows the intended track: 240 miles from Bircham Newton to Borkum, thus avoiding an infringement of Dutch territory; an alteration to starboard and a 300-mile flight to Berlin; a last leg of 420 miles to one of the Independent Force fields in the Nancy area.¹⁰³

Mulock had only one other question to raise. 'You have definitely laid down in your original letter to me that no operations are to be carried out except under your instructions,' he wrote Trenchard. 'In view of the above, would you kindly give me the orders required for this emergency operation.' In his reply Trenchard expressed his full agreement with the steps Mulock had taken, and then gave him a free hand: 'I give you freedom to carry out this operation on the lines you propose when you consider you are ready, as you are in a better position to judge for an emergency operation than I am.' So to Mulock was given responsibility for what would have been, politically, the most significant British air operation of the war. But Berlin was not to know the roar of hostile bombers for another generation. Early on 11 November Mulock received a signal from Trenchard: 'Hostilities cease today at 11.00. You will not carry out operations without orders from this HQ but preparations are to proceed.*' The strategic bombing campaign was over

* In a short historical account of No 27 Group in his personal papers Mulock stated that because the Air Staff was fearful that 'we might push off and take a chance' on bombing Berlin, he was 'withdrawn from my Unit and kept in London the last ten days of the war,' returning to Bircham Newton only on the afternoon of 10 November. 'They thought it was too big a temptation to leave in the hands of anybody.' Nonetheless, No 27 Group had a last fling of sorts. On Armistice Day one of the v1500s flew over London 'with forty-one on board - ten girls and thirty-one men.' After the Armistice, Mulock recalled, 'our Unit was kept on duty and the Germans were

before the machine, which more than any other embodied the hopes of the Air Staff, could be used. Except for a single aircraft which bombed Kabul in early 1919 during the Afghan War, the Handley Page v1500 was never to be employed in operations.¹⁰⁴

In assessing the work of the Independent Force as an autonomous 'strategic' weapon, that is as a war-winning weapon separate from other armed forces, it is important to emphasize once again that in Trenchard's hands it was never used primarily for that purpose. Despite Sykes' instructions, only 16 per cent of Independent Force raids from 5 June to 30 September were directed against German chemical and steel plants.* By October the force was committed so heavily in support of ground forces that Trenchard no longer had a genuine freedom of choice with respect to targets. In his final despatch to Lord Weir he defended his decision to give low priority to industrial targets:

(i) It was not possible with the forces at my disposal to do sufficient material damage so as to completely destroy the industrial centres in question.

(ii) It must be remembered that, even had the Force been still larger, it would not have been practical to carry this out unless the War had lasted for at least another four or five years, owing to the limitations imposed on long range bombing by the weather.^{†105}

Nor was it weather alone which limited the effectiveness of the British bombing force. As we have seen, the Independent Force was a long way from having solved its technological problems. It is also questionable whether, measured against its limited effectiveness, the force could have been sustained indefinitely in view of its heavy losses. There surely can be no quarrel with Trenchard's rejection of the Air Staff's 'obliteration' approach as utterly impracticable. For it, however, he had substituted another strategic aim: the crippling of the German will through the psychological effects of bombing. As he told Weir, he had spread the raids of his bombers over as many targets as possible in order to maximize these effects, for 'at present the moral effect of bombing stands undoubtedly to the material effect in a proportion of twenty to one.'¹⁰⁶

told that if they hesitated or played any tricks, these long distance bombers would go over and pay a visit to Berlin. The Unit was kept armed and on duty for about two weeks.' Mulock Papers, 121, R.H. Mulock biographical file, DHist. Confirmation of part of the last statement is to be found in the minutes of the Air Council of 29 November 1918, in which it is noted that two v1500s 'must remain available fully equipped for carrying out special demonstrations [over Berlin] if needed.' The phrase 'over Berlin' is stroked out in the draft copy of the minutes. Minutes of 64th Air Council meeting, 29 Nov. 1918, Air 6/13

* During the 396 days of the strategic bombing campaign from bases in the Nancy area, 508 raids and 51 individual bombing sorties were carried out, during which 14,911 high explosive bombs and 816,019 incendiaries of a total weight of over 665 tons were dropped. Bombing records show that in the June–September period there were 416 raids, of which 34 were against chemical works and 34 against steel plants, while there were 185 raids against rail targets and 139 against aerodromes. Miscellaneous targets of purely military value accounted for the remaining 24 raids. Air 1/415/15/312/20; Alan Morris, *First of the Many: The Story of the Independent Force, R.A.F.* (London 1969), 172–3

† Trenchard's final despatch was published as a supplement to the *London Gazette* on 1 January 1919 and was subsequently reprinted in the 9 January issue of *Flight* (52–55) under the title 'The Work of the I.A.F.'

Trenchard's doubts about the importance of the material damage wrought by his squadrons were confirmed by a British investigating commission which surveyed some of the force's chief targets immediately after the Armistice. The commission found that the physical results of bombing had been minor. Little impact had been made on the steel industry: 'With perhaps few exceptions, damage of Works cannot be said to have been great. Very complete records have been kept of the position in which every bomb has fallen that was anywhere near the Works, together with reports stating what damage each bomb caused. The damage has, except on rare occasions, been confined to masonry, roofs, gas pipes, windows, blowing engines, coke ovens and machinery shops. It is very noteworthy how surprisingly little serious damage has been throughout 4 years of war, and on no occasion has a Works been forced to close down for more than a week as the direct result of bombing.'¹⁰⁷ The commission's findings were similar with respect to the chemical plants it visited: 'Generally speaking the damage caused has never been of such a formidable nature that repair has been impossible. Such damage as was caused was annoying and entailed extra labor, but did not affect the output of the factory in any way. The total output from a military point of view was never once diminished.'¹⁰⁸ In monetary terms the damage inflicted upon German industry by allied bombing in 1918 amounted to 15,380,000 Reichsmarks – a sum that is less than a tenth of 1 per cent of German war expenditures.* Trenchard's judgment had been convincingly vindicated.

How successful had the bombing campaign been in sapping the morale of the German people, and hence in adding to the political pressures to end the war? Both Trenchard and the Air Staff had been encouraged to believe that civilian morale was breaking down in the face of the bombing by an intelligence survey based upon agents' reports and a number of letters taken from German prisoners of war. Typical of such letters was the following, written from Mannheim in late March 1918: 'Today at noon they were here again. The noise of the bombs and crashings was terrible. How will all this end? Others will be so affected that they will be ill all their lives, and still no peace.'¹⁰⁹ Unquestionably, in the case of this individual, the bombing campaign had already been spectacularly successful. But how general were such feelings, and what was their duration? The survey men-

* It is impossible to determine with any reasonable degree of accuracy what proportion of the damage was done by British bombers alone. The nine centres surveyed by the commission had received 59 British and 110 French attacks. On the other hand, a detailed examination of operation summaries for October (the only month in which the IF provided French tonnages) shows that the British, at that point, were accounting for two-thirds of the tonnage.

Gen Hugo Grimme, *Der Luftschutz im Weltkrieg* (Berlin 1941), 109, 136, DHist SGR I 196, Set 87, is a guide to German property damage from air raids. Though property owners had a natural tendency to exaggerate damage, their estimates were thoroughly investigated by German officials and the figures they finally accepted probably reflected fair market value. The significance of monetary estimates of damage is affected by the wartime depreciation of the mark – it fell by 50 per cent in terms of the United States dollar between 1914 and 1918 – but it by no means invalidates them, since hyperinflation did not hit Germany until 1922. See Gustave Stopler, Karl Hauser, and Knut Borchardt, *The German Economy, 1870 to the Present* (New York 1967), 57, 84. Because of the decentralized nature of the German federal system, it is impossible to give a precise figure for German war expenditures. Grimme estimated an expenditure of 147,000,000,000 RM, while Stopler *et al* give the figure 164,300,000,000.

tioned made use of several such letters; there seems to have been no follow-up. Since wartime intelligence is of necessity built up from such shreds of evidence, it is understandable that some weight – perhaps undue weight – was given to this tiny sampling by those most concerned with the bombing offensive.

The British commission of investigation seems to have expected to encounter all the signs of a widespread collapse of civilian morale caused by the bombing. Certainly they were extremely sceptical of any evidence to the contrary. When a director of the Rombas steel works stated that the time spent by workers in air raid shelters was 'largely devoted to dancing and other amusements,' the commissioners were notably unimpressed. 'Although the Directors of one or two of the Works visited affected to make light of the moral effect produced by air raids, there can be no doubt whatever that it has been very considerable in many cases,' they reported, 'and, if we regard the results as a whole, relatively greater than the material damage achieved.'¹¹⁰

Nevertheless, the commissioners were impelled to record evidence in conflict with their views: 'The management of the Works visited did not appear to have experienced much difficulty in retaining their employees, even during 1918 when the moral effect of bombing was beginning to make itself seriously felt. In the case of the men this is not surprising as, in the event of their refusing to remain, they would doubtless have been sent to the trenches or other unhealthy spots. But equally little trouble seems to have been experienced with regard to the women.'¹¹¹ At the Oppau Chemical Works in Ludwigshafen the commissioners were told that absenteeism had been high during the spring and summer of 1918, but had dropped sharply in the autumn. They attributed the absenteeism to bombing and the influenza epidemic and the recovery from it to higher wages which had been given to workers in the fall.¹¹² Yet the influenza epidemic reached its height in Germany during the autumn months; the earlier outbreak had been comparatively mild. Even leaving influenza out of account, how serious was the malaise from bombing if it could be dispelled by higher wages? It is worth noting that Ludwigshafen, unlike some other industrial centres, continued to receive raids until 24 October. The likeliest explanation seems to be that, as in Britain, there was considerable early unease among industrial workers because of bombing, but that ultimately most workers were able to build up mental defences against it.

The commission, one of whose members was Brigadier-General Newall, concluded that 'had the war continued a few months longer, a more or less total breakdown of labour at several of the Works might have been confidently expected.' On its own evidence, this claim was unconvincing. No more persuasive was Sykes' judgment that 'Had these attacks been carried out earlier and with adequate forces, say, five hundred bombers devoted solely to this purpose, there can be no reasonable doubt that the Germans must have collapsed during the summer of 1918, owing to the disorganization of their munition factories and industrial resources.'¹¹³ The myth that the Independent Force had made major inroads upon the German psyche was given further credence by the treatment accorded the question on the part of the British Official historian. Although *War in the Air* did refer to the 'unevenness' of the effects of bombing upon morale, the evidence there presented accords with the commission's findings. The further

claim is made that 'There were German authorities who believed that a stage had been reached in the autumn of 1918 when intensification of the bombing attacks must have caused a break-down of labour in those steel works which had suffered most.' This judgment appears to be based upon a speculative statement made by a certain Major Grosskreutz, writing in *Die Luftwacht* in October 1928: 'The direct destructive effect of the enemy air raids did not correspond with the resources expended for this purpose. On the other hand, the indirect effect, namely, *falling off in production of war industries*, and also the *breaking down of the moral resistance of the nation*, cannot be too seriously estimated.'¹¹⁴

It is undeniably true that bombing affected morale. As the directors of some of the firms surveyed pointed out, even an air raid warning could cause workers to down tools for an hour or so, a break that could spell the most serious consequences for a steel plant.¹¹⁵ A case in point, mentioned in *War in the Air*, was that of *Roechlingsche E & S Werke* of Völklingen. According to the management of this large steel works the production loss during the last year of the war amounted to 15,563 tons. Impressive at first glance, this figure in fact represents only 4.6 per cent of the factory's 1913 production of over 340,000 tons.* Even if extended to the whole of that fraction of the German war economy touched by Independent Force raids, losses such as these are well within tolerable limits. They scarcely testify to a morale problem so acute as to threaten the capacity of the state to wage war. To put the matter in proportion (having in mind the limited incidence of the 1918 raids), it was not until the end of 1944 that significant deterioration occurred in German war production as a result, in part, of the allied bombing offensive in the Second World War. By then the Anglo-American bomber fleet had reached a delivery rate of over 90,000 tons of bombs monthly, the product of a staggering 18,000 sorties per month.† This deterioration was the result principally of *material*, not *moral* damage, through pinpoint raids on the oil industry and other key industries.

Absenteeism induced by bombing may have caused a slight drop in German war production. Raids and raid alarms may also have added to the general war-weariness of the population, at least in the affected zone. There was sufficient dispirit in early 1918 for a Cologne deputy to propose 'a cessation of bomb raids other than on battle fronts.' The public voicing of such sentiments is surely of some significance, even though the Cologne press repudiated them. The government position, as stated in the Reichstag, was that the deputy 'had lost sight of the plight of French cities which had endured more than three years of war with great steadfastness, and that up to the present we have received no proposals from hostile governments and that no definite measures could be taken unless certain advances were made by the enemy.'¹¹⁶ Perhaps had Berlin been bombed the

* Although the 1918 production of this works is not known, the 1913 figure was available to the British official historian. The 1918 production is unlikely to have been lower and was conceivably considerably higher than the prewar output. Minute to FO3, 5 July 1918, Air 1/460/15/312/97

† For the allied bombing effort see Appendices 40 and 44 of Sir Charles Webster and Noble Frankland, *The Strategic Air Offensive Against Germany, 1939-1945*, IV: *Annexes and Appendices* (London 1961); Appendix 49, 'Indices of German Finished Munitions Output,' gives monthly figures for eight classes of war goods.

Cabinet and the High Command might have had a different reaction, but under the circumstances, and given the nature of Imperial Germany's political system, it would be difficult to contend that the psychological effects of the bombing of the German southwest had much to do with the decision of the government to seek an armistice.

Despite the claims of the Air Staff, therefore, and despite the report of the commission, it cannot really be said that the work of the Independent Force was a success strategically, either in terms of the damage it caused or the psychological havoc it wrought. What is surprising about Trenchard's assertion (not to speak of the uncritical acceptance it has received) is that it should have been made at all, given the disproportionate attention he gave to targets of a non-industrial character.* It is here that the real criticism of the force is to be made. Nearly half of all raids were directed against railways, yet it is hard to see that these targets merited the lives and material expended upon them. Trenchard himself told Weir: 'I ... had to decide, when it was impossible to reach their objectives well in the interior of Germany, what alternative objective should be attacked, and which attacks would have the greatest effect in hastening the end of hostilities. I decided that railways were first in order of importance ... The reason of my decision was that the Germans were extremely short of rolling stock, and also some of the main railways feeding the German Army in the West passed close to our front, and it was hoped that these communications could be seriously interfered with, and the rolling stock and trains carrying reinforcements or reliefs or munitions destroyed.'¹⁷

Trenchard's decision was a rational one. It was based firmly on his previous experience and was perfectly consistent with the principle for which he had fought so tenaciously before the formation of the RAF and the creation of a strategic bombing force – that is, that the prime use of the air weapon was as an auxiliary to the armies in the field. The bomber, however, was not yet a lethal weapon against rail traffic. The most heavily attacked target of the whole campaign was the Metz-Sablon railway triangle, a scant twelve miles behind German lines and of purely local military significance. Though occasionally spectacular results were obtained, such as when 100 Squadron blew up a munitions train in Metz station, for the most part the lines there were never completely closed to traffic, and in all cases normal service was restored within a short time. As the official British historian has said, in characteristic style, 'the results of the bombing operations against railway stations and rail communications generally may be summed up as, on the whole, disappointing.'¹⁸

* In his diary Trenchard was much more cautious about the material and moral effects of bombing than he was in his public pronouncements. On 18 August 1918 he wrote: 'I wonder whether when the war is over what truth we shall get out of the enemy with regard to the actual damage done by this bombing. I am certain the damage done both to buildings and personnel is very small compared to any other form of war and the energy expended. The moral effect is great – very great – but it gets less as the little material effect is seen.' And then he added a sentence which allows quite another construction of his famous dictum: 'The chief moral effect is apparently to give the newspapers copy to say how wonderful we are, though it really does not affect the enemy as much as it affects our own people.' Quoted in H.M. Hyde, *British Air Policy Between the Wars, 1918-1939* (London 1976), 44

Of all the aspects of the Independent Force's work, the bombing of enemy aerodromes was the most dubious. No less than 40 per cent of the entire tonnage of bombs dropped between 6 June and 10 November was aimed at aerodromes. According to the force's commander, such a concentration of effort was necessary to 'prevent enemy's bombing machines attacking our aerodromes and in order to destroy large numbers of the enemy's scouts on their aerodromes, as it was impracticable to deal with them on equal terms in the air.' There are, unfortunately, no trustworthy German accounts of aircraft losses resulting from bombing, but verifiable fragmentary returns show that on six raids a total of twelve aircraft were destroyed and twenty-one damaged. Nor in postwar German accounts of the air battle do losses from aerodrome bombing figure as a problem.¹¹⁹

What is important to stress is that the forces opposed to Trenchard were not large, being neither so formidable as he thought nor as postwar British commentators believed them to be. Only one bombing wing, No 8, a Bavarian unit composed of eighteen Class B aircraft, was directly opposite the Nancy bases. Its base at Boulay was attacked forty-nine times from June until September, including twenty-two raids in August alone. This amounted to a third of all aerodrome attacks by the Independent Force. Yet even in August this wing managed to retaliate against Xafféwillers five times and Azelot four, with a signal lack of success.¹²⁰

The inroads made by German fighters upon the day bombers were probably good cause for counter-attacks upon their home fields. Yet there were never more than six home defence squadrons defending the area attacked by the Independent Force. Moreover, *Kerst* airfields at Saarbrücken and Mainz, two areas where heavy bomber losses were sustained, were never attacked, nor were the two *Kerst* bases at Freiburg. The success of the German interceptors (though they were probably aided by front-line squadrons) led to a natural exaggeration of their magnitude by Trenchard and by later commentators. Sykes, for example, stated that Independent Force bombing had caused twenty squadrons to be withdrawn from the front for home defence, while E.J. Kingston-McCloughry, using Air Ministry estimates, wrote in 1935 that the Independent Force was opposed by sixteen home defence flights and five pursuit squadrons, a total of 330 aircraft. Had the true strength of German forces been established, perhaps a sounder estimate of the challenge of fighter forces to unescorted bombers would have obtained prior to 1939.¹²¹

The losses of the Independent Force were indeed high. As the direct result of enemy action 104 day bombers were lost, against sixty-four German machines claimed to have been shot down. In night operations thirty-four bombers were lost, most of them probably to anti-aircraft fire or because of navigational error or mechanical failure. To these figures must be added the enormous total (in First World War terms) of 320 bombers which crashed behind allied lines. Casualties reached their height in September, when thirty-seven machines were lost over enemy territory and fifty-four crashed within the lines; in a single month the force lost 75 per cent of its establishment of 122 aircraft. A concerned Air Staff noted that during the same period No 5 Group, flying long-distance raids out of Dunkirk, had lost a single DH9 out of fifty-eight and one Handley Page of sixteen.¹²²

Though invited to do so, Trenchard never offered an explanation of his losses. He might legitimately have given many reasons, but his own approach to the air battle was not a negligible factor, and certainly stood in contrast to that of No 5 Group, a formation infused with RNAS thinking. Thus when Trenchard appointed Major Read to command 216 Squadron, a former naval unit, he did so in order to purge it of 'RNAS ideas.' According to Read, Trenchard took exception to the reluctance of naval airmen to fly in poor weather, or to fly more than one raid a night. He objected to their general conservatism and lack of 'ginger.' No 216 Squadron, having lost only two aircraft in its previous ten months of operations, obviously required shaking up. Read was an aggressive commander, but even he was not prepared to push his squadron quite as hard as Trenchard would have wished.¹²³

Trenchard's own aggressiveness and apparent readiness to accept high casualties were inseparable from his idea of war. His central belief was in the relentless pursuit of battle, in the seeking out of combat, in the incessant struggle in which the weaker side ultimately gave way. His ruthless application of this approach to the RFC had caused Sir William Robertson qualms as early as September 1916 and had brought serious morale problems to the front-line squadrons in 1917. Like most of his fellow army officers, Trenchard accepted the idea of victory through attrition. Such a cast of mind, wedded to the weapons then in use, had led to four years of profitless slaughter on the Western Front. Neither the RNAS nor the German air force seem to have taken the view that the technological factors which had created the stalemate on the front, and seemed to dictate the war of attrition, necessarily applied to the air. Trenchard was of another opinion.^{*124}

Though the Independent Force was successful neither as a strategic weapon nor as an auxiliary to the allied armies, the achievement of its airmen was extraordinary. Some of the young men who found their way to its squadrons were unable to meet the harsh demands of the bombing campaign. But under adverse circumstances most of the force's airmen carried out their missions with high courage and tenacity. Some were outstanding, among them the twelve Canadians who received the DFC. For all Canadians, as for all their crewmates from Britain and other parts of the empire, the bombing war was a test of steadfastness and teamwork in the face of multiple hazards. Of the more than 150 Canadians who served with the force, a third became casualties on actual operations.

Given the central place that strategic bombing occupied in the operations of the Second World War, it seems appropriate to consider whether the Canadians who took part in the work of the Independent Force had any influence upon the RCAF prior to 1939. This does not seem to have been the case. Most of the Canadians who survived the bombing campaign went back into civilian life, some, of course, to civil aviation. None who joined the RCAF rose to high rank in that service. Not

* Trenchard's private valedictory was filled with bitterness. 'A more gigantic waste of effort and personnel there has never been in any war,' he wrote in his diary on 11 November. Though his airmen had 'done splendidly,' they would have done as well had an independent force never been created. 'It has certainly taught me what I really knew before - an impossible organization was set up by the politicians simply in order that they could say, "I am bombing Germany."' Trenchard Diary, 11 Nov. 1918, quoted in Hyde, *British Air Policy*, 44-5

even R.H. Mulock, most advantageously placed of all the Canadians to form an assessment of the worth of strategic bombing, seems to have become a convert. He imparted his thoughts on air power to a meeting of the Canadian Club in Winnipeg on 18 September 1919. His remarks made clear his strong belief in the future of military aviation, but in an auxiliary role only. He mentioned bombing only in passing, and then apparently because pressed to do so.

Mulock did attempt to explain why Canadians should have taken, numerically, so large a part in the war in the air: 'The men of the air service would take any risk, do anything. And the wonderful thing we found towards the end was that, no matter how much our losses were – and they were terrific – there was never any lack of volunteers. And the colonial chaps came forward in greater numbers than anyone else. There is perhaps a reason for that. Perhaps it is due to the freedom in which the colonial chap is brought up.'¹²⁵ Mulock here was touching on an explanation offered by many Canadians of his time, who thought of themselves as tough, individualistic northerners schooled by a rugged environment and therefore possessing the kind of qualities the air war pre-eminently demanded. Yet those who flew with the Independent Force were scarcely frontiersmen or 'wild colonial boys.' Of the eighty-nine whose occupations are known, 40 per cent came from the professions or from business and another 31 per cent were university students. Most of the students and fifteen of the twenty-seven professionals were, like Mulock, engineers. Two-thirds of the 120 men whose place of residence upon enlistment is known were from urban centres.¹²⁶ In other words, the typical Canadian member of the Independent Force was a well-educated, technically-oriented, middle-class city dweller, at a considerable remove from the picture of the airmen held in popular mythology. Yet this conventional background seems to have instilled the quiet courage to endure patiently the numbing cold and unpredictable hazards of black night flights, and the discipline to hold to tight formation when every normal instinct urged otherwise.

PART FOUR
Airpower in the Land Battle



M.M. Bell-Irving and A.D. Bell-Irving,
Loretto, Jan. 1915 (RE 19933)

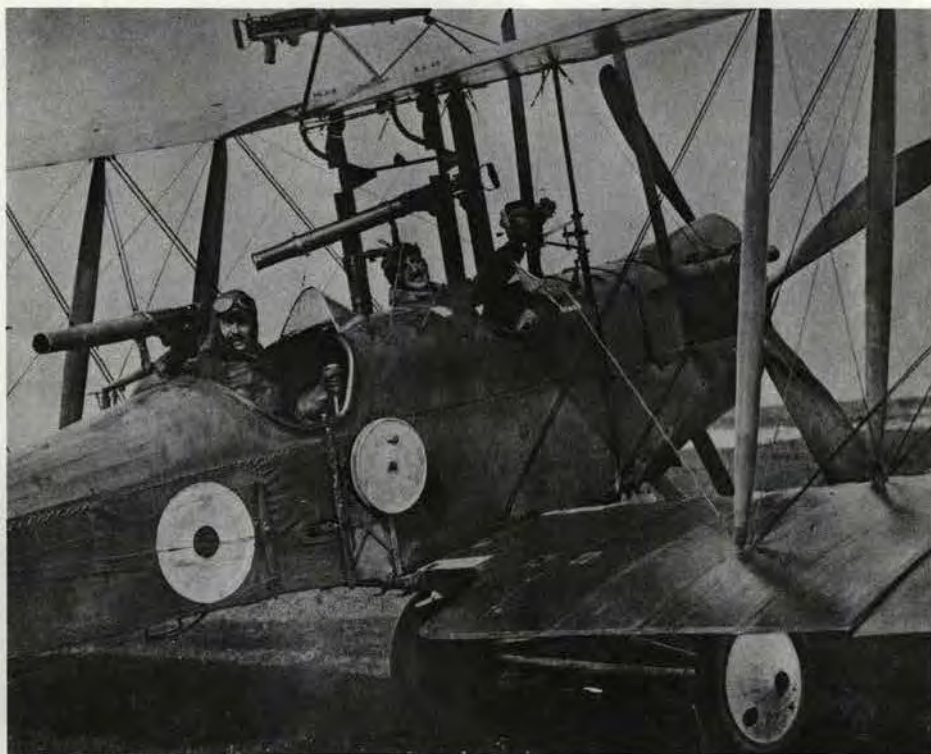
Lt-Col. F.A. Wanklyn of Montreal was the first Canadian to join the British flying services. This photograph was taken at the time he flew his tests for his RAE pilot's certificate no 284, dated 3 Sept. 1912. (AH 585)



The Vickers FB5 'Gun Bus' – the first aircraft designed for air-to-air combat – reached the Western Front in the spring of 1915. (AH 177)



Stanley Winther Caws, who enlisted in Edmonton, was probably the first Canadian airman to be killed in action. (AH 596)



One of the first Canadians to fly in France was Capt. K.E. Kennedy of Sherbrooke, Que. He was an observer with 4 Squadron from mid-April to mid-August 1915. This BE2c was unusually well armed. (DND 65-188)