

England without Cabinet authorization and without informing his colleagues. Yet the Minister's unilateral initiatives in aviation policy were certainly subsumed under what the Prime Minister described as his penchant for administering his department 'as if it were a distinct and separate government in itself.' Hughes' meddling in aviation had contributed to the final exhaustion of his leader's almost superhuman tolerance of his erratic behaviour.⁷⁸

Lord Sydenham found Borden's blanket assurance insufficient and, indeed, incomprehensible. How could the Prime Minister of a self-governing dominion accept calmly the re-establishment in his country of an imperial command not subject to the control of his own government? Even if the Canadians were negligent with respect to the principles underlying the evolution of colonial self-government, ought Britain to be negligent as well? He wondered, in fact, 'whether, since the withdrawal of the Imperial Garrison from Canada, it was possible for us to exercise command over British troops in Canada at all.' The situation was fraught with dangers. Canadians were notoriously an unruly people, and Canadian pilots had shown themselves less amenable to British discipline than was desirable. 'There had been troubles with Canadians here,' he observed gloomily, 'it would be worse over there.'⁷⁹

It was General Brancker who brushed aside these constitutional niceties and persuaded his chief to grasp the nettle. As early as 20 October, irritated beyond measure by the endless confusions of the Canadian negotiation, and more and more concerned about the prospects for the RFC's order of battle on the Western Front in 1917, he had burst out to Harvey: 'We *must* do something. We have played with this matter for more than 18 months now. If only it had been boldly handled originally we should have obtained much benefit by now.'⁸⁰

The following day Brancker began to apply pressure to Henderson, pointing out that 'increased establishments are being demanded from the Expeditionary Force, and we must start a training establishment in Canada at which the full benefit of the Canadian and American training machines can be reaped.' General H.M. Trenchard was insisting upon an increase of twenty service squadrons and thirty-five reserve squadrons; 'the matter is very urgent, as in order to obtain output both of pilots and equipment by next spring, the work must be put in hand at once.'⁸¹

As we have seen, Henderson was not yet convinced by these arguments at the time of the meeting with Flavelle on 27 October. Shortly thereafter Brancker drew to his attention the likelihood that twenty of the thirty-five new reserve squadrons would either have to be located in Canada or elsewhere outside Britain, because new training sites at home were no longer readily available. Moreover, given the heavy demands upon British aircraft production, it was vital to make use of North American capacity for the manufacture of training machines. Obviously it would be much cheaper to use these machines in Canada than to pay the costs of shipping them across the Atlantic. These cogent arguments wrought a remarkable transformation in Henderson's views. He was impressed by Brancker's reasoning with respect both to the shortage of British training sites and the economic advantages of employing North American production in Canada, but what he found most persuasive was the very scale of the training operation now deemed essential because of the crisis faced by the RFC on the Western Front. The job in prospect,

he thought, was simply too big to be entrusted to the Canadians. At a conference with Air Board members on 20 November he announced his conversion: 'If the proposed training establishment were to be on this scale it would have to be run by the Imperial authorities. We should have to send over so many senior officers that they would work better under the Imperial Government ... If of the proposed dimensions, the school would not be workable in Canadian hands.'⁸² When the full Air Board met on 22 November to consider this change in the position of the War Office, nothing further was heard of Sydenham's constitutional scruples. As Lord Curzon observed, 'a new situation had arisen' because of Haig and Trenchard's demand for twenty more service squadrons. The board therefore accepted the recommendation of Henderson and Brancker that it was 'indispensable' that so large a training organization should be under imperial control. By early December Curzon had won over the Treasury by stressing the size of the project and the military emergency which rendered it necessary.⁸³

On 23 December the Canadian High Commissioner was officially notified that a large British training organization was about to be established in Canada. This was the inception of the RFC Canada scheme, the single most important development in Canadian air history to that point. Canadians, under British tutelage, were now to be trained for the air war, and for the air age to come, not in hundreds but in thousands. For the future of Canadian aviation, RFC Canada was a priceless benefit. For the Canadian government of the day, it was an expedient that satisfied British military requirements and yet averted the creation of a Canadian air force under unwelcome auspices.⁸⁴

It was in this fashion that the Canadian government arrived at its posture of colonial dependency in the field of aviation. Many factors had brought this about. The government and its advisers were ignorant of the new significance of air power. Nor had the advocates of a Canadian role in aviation been impressive, appearing to Borden and his colleagues either as well-meaning nuisances or as self-seeking promoters. The Imperial Munitions Board, so forthright and aggressive in safeguarding what its members saw as imperial economic interests through the project of a Canadian aircraft factory, had not thought it worthwhile to fight for a Canadian air service. Sir Sam Hughes, both through his tactics and by his association with a scheme that his colleagues understandably saw as politically dangerous, had eliminated what faint possibility existed that the government might reconsider its priorities. The Prime Minister had given no leadership, but had sought instead the least burdensome form of commitment. As a result, the tide of events at the front had overtaken Canadian indecisiveness and Canada became host once again to an imperial military presence, on a scale the Cabinet could hardly have anticipated. Yet, up to the final stage of negotiations, had any minister other than Hughes taken up the idea of a Canadian flying corps with the same vision, determination, and principles that marked the government's attitude towards the CEF, there is no reason to suppose that a Canadian service might not have been inaugurated in 1916. Whatever the preferences of Sir David Henderson, given the Australian precedent and the urgent needs of the RFC, the British were in no position to refuse.

RFC Expansion and the Canadian Air Training Organization

The origins of the large training organization which functioned in Canada for the last two years of the war were unusual, and its status was anomalous, but it was to have a vital influence upon the war in the air and a decisive impact upon the development of Canadian aviation.

RFC Canada (or the 'Imperial Royal Flying Corps' as its stationery and advertisements proclaimed it) enjoyed the co-operation and support of the Canadian government, but was quite autonomous. Though the appropriate Canadian authorities were kept informed of its activities and requirements, the commander of RFC Canada was responsible directly to the War Office (later the Air Ministry) in London. Drawing recruits from across the country and from the United States, the British organization was concentrated in Ontario, with headquarters in Toronto. Never large – its staff and trainees numbered just under twelve thousand at the Armistice – it was certainly sizable in terms of existing military aviation establishments, and rapidly produced an elaborate supporting structure.

RFC Canada's unique situation, the fact that it was competing with the Canadian Expeditionary Force for recruits at a particularly difficult period of the war, and its deep involvement with the United States armed services and American trainees might well have brought tensions with its Canadian hosts. Frictions did occur, but on the whole the relationships between this extension of the British services and the government and people of Canada were remarkably free of difficulties and misunderstandings. The government had gone some way to satisfy critics of its policy towards aviation by providing financial assistance for the aircraft plant and land and facilities for flying schools and airfields, as well as direct help through the militia department. Among the general public there was increasing acceptance of the importance of aviation to the war, and some pride in the part Canadians appeared to be taking in it. The training scheme had its critics, but they were few in number.

A good measure of the success of the RFC Canada undertaking must be assigned to the diplomatic and executive abilities of its commander, Lieutenant-Colonel (later Brigadier-General) Cuthbert G. Hoare. He had received his pilot certificate in 1911, and as a captain was one of a small group of officers belonging to the recently-formed Indian Air Corps (prior to 1911 he had served with the 39th Central India Horse) stationed at Farnborough when war broke out. Posted

immediately to an RFC squadron in France, he later commanded 7 Squadron at St Omer and by 1916 had been given command of a wing.

When Hoare was selected to head RFC Canada, many of the details of the Canadian enterprise had already been worked out in a series of meetings of the Air Board, attended by representatives of the Imperial Munitions Board. It was decided that only the preliminary stages of ground instruction and flying training would be given in Canada and that trainees would complete their preparation in Britain. At a meeting on New Year's Day 1917 it was agreed to send out an advance party as soon as possible, to be followed at intervals by groups of experienced officers and men who would form the nucleus of the twenty training squadrons and the supporting ground units. The RFC commander would then be responsible for recruiting not only the cadets he was to train, but also the bulk of the people needed to operate the plan.¹

Beyond this, Hoare was given virtually a free hand. Though Toronto had been tentatively selected as his headquarters, since the plant to manufacture his training machines was located there, he was free to shift elsewhere if he wished. The Imperial Munitions Board was to handle the building of airfields, but it was Hoare who had to decide how many he needed and where he wanted them. In his hands were left such details as the number of hangars, barracks, messes, and other buildings needed, as well as type of construction. He had to set up accommodations for his staff, to form stores depots and other supporting units, devise a recruiting campaign, and provide for rations, uniforms, medical facilities, and the other multitudinous details demanded by the scheme. All these things he and his staff accomplished with remarkable speed.

The staff Hoare brought with him was almost entirely British. It included Major Dermott L. Allen, formerly a pilot with 3 Squadron, who became Hoare's chief staff officer in Canada. The only Canadian in the initial group was Lieutenant John K. Aird of Toronto. His father, Sir John Aird, general manager of the Canadian Bank of Commerce, had taken considerable interest in air matters; Aird's brother was in the Royal Naval Air Service; and Aird himself had been flying with the RFC since early 1916. He took a leading part in the inauguration of flying training and later commanded a training squadron.²

Hoare put his staff to work during the passage to Canada, and together they planned a rough schedule for the development of the training scheme. When the group landed at Saint John, NB, on 19 January, Hoare went to Ottawa while the rest of the party proceeded to Toronto. In the capital Hoare met officials of the militia department, the Imperial Munitions Board, and other agencies. His most important meeting was with General Willoughby Gwatkin. The Chief of the General Staff proved to be one of the best friends that the RFC had in Canada and came to the rescue of Hoare and his staff on several occasions when they found themselves in potentially serious trouble. Hoare's first encounter with Gwatkin, though, was not auspicious: "My first meeting with General Gwatkin on arrival in Canada ended rather abruptly. He asked me how many men I should require. On my saying 500 for a start he said I couldn't get 500 in six months and added "The best thing you can do, young man, is to turn around, go straight home, and tell them you've been sent on a fool's errand." Somewhat nettled, I replied that the

time to go home would be *after* having tried, and not *before*. On that we parted. We subsequently became the best of friends and he helped us in every possible way. Neither of us ever referred again to our first meeting.³

Despite this gruff beginning Gwatkin wasted little time in demonstrating his intentions to help the RFC in Canada. Hoare got to Ottawa on the night of 21 January and on the 23rd Gwatkin advised the commanders of his Military Districts of the RFC commander's arrival and instructed them to be ready to 'render him all assistance' possible. When Hoare left for Toronto on 25 January he took with him firm assurances that the militia department was ready to lend assistance with recruiting, administrative services, and provision of accommodation and other facilities for his men and that government land would be made available for his aerodromes. Headquarters space was obtained in the Imperial Oil Building at 56 Church Street in Toronto and the RFC Canada was in business.⁴

It was hoped that flying training might start by the beginning of April but there was much to do and many problems to solve. The countryside was covered with snow and the ground was frozen, adding to the difficulties of immediate construction work. The only aerodrome in the region was the small field at Long Branch with its several hangars. This was the site that had been used by the Curtiss School during 1915-16 but it was not suitable as a major flying field for the RFC. Other aerodrome sites had to be selected and readied and aircraft had to be obtained. The bulk of the personnel needed to operate the training scheme and to permit its development still had to be recruited, quite apart from the pilot trainees themselves.

Hoare's first job was to select sites for his airfields. The RFC's plans called for the twenty training squadrons to be grouped in four wings, each comprising five squadrons. Three of the wings were to be located in the general area of Toronto and it was tentatively proposed that the fourth would be situated in some part of the country where winter flying was feasible, the west coast being favoured. Each wing was to consist of one or two aerodromes, complete with facilities for the men and the machines.⁵

On 26 January, the day after arriving in Toronto, Hoare went to look at Camp Borden, which had been suggested by the militia department as a possible site for his first wing. The outlook was not promising. As he set out to cover the seventy miles from Toronto, the ground was snow-covered and the temperature well below freezing. Hoare was accompanied by Major-General W.A. Logie, General Officer Commanding Military District No 2 in Toronto, and several other staff officers, and when they reached Angus they found the branch railway line to Borden closed for the winter. The party had to break trail by sleigh and it took nearly two hours to cover the five miles from the rail line. In the circumstances, Hoare was not enthusiastic about what he saw when he arrived at Camp Borden. He inspected the area 'so far as possible' but it was difficult to determine how flat the ground was. Over much of it stumps protruded through the snow. Hoare had heard that the whole district had a 'very bad reputation for sandstorms.' Nevertheless, on the advice of General Logie, Hoare decided to accept the site. The land belonged to the Canadian government, which offered it rent-free to the RFC. It was close to Toronto; a power plant, a sanitation and water system, and a railway

siding had already been installed for the thirty thousand troops of the Canadian Expeditionary Force encamped there in 1916. That wintry day in early 1917 was therefore the origin of what was later to become the senior air station of the Royal Canadian Air Force.⁶

Having made his decision, Hoare returned to Toronto and the next few days were busy. On 27 January he wrote several letters to Gwatkin. He wanted to begin recruiting immediately. He wanted accommodation for one thousand men in the Toronto area. He wanted clothing and 'regimental necessities' for his recruits. He wanted to know whether the militia department could provide medical and dental services for his force and medical examinations for recruits at points across Canada. A cabled request for provision of most of these services on a repayment basis had by this time been received by the militia department and Gwatkin told the British Army Council on 30 January that they would be forthcoming.⁷

The Imperial Munitions Board obtained permission from the militia department to proceed with construction and other work at Borden and contracts for the work were signed on 27 January. Eight days later the rail line into the camp was open and 400 men were at work in freezing weather, clearing stumps from the ground and preparing the area for construction. A week later 1700 men were continuing the work through the night with the help of powerful arc lights. Six weeks after Hoare had inspected the area most of the hangars called for had been finished and enough accommodation was ready to permit a training squadron to form there and start assembling its aircraft. The initial project for the camp was finished on 2 June. Hoare specified that the buildings at Borden were to be of a 'semi-permanent nature' and he arranged for 'the cheapest forms of construction compatible with strength ... giving due consideration for the necessity of heating next Winter.' Despite this and the hectic pace at which the work was carried out, they must have built well, for most of the fifteen hangars put up for the RFC Canada are still in use, serving the Canadian Armed Forces at Camp Borden.⁸

In four months the contractors had erected fifty-seven buildings, cleared and levelled 850 acres and sowed the ground with grass seed, built almost five miles of asphalt road and laid additional sewage pipes and rail sidings. They had installed an electrical system and strung telephone lines to connect the field with Toronto and neighbouring towns. The buildings so successfully developed for the Borden aerodrome served as the standard pattern for subsequent RFC flying fields.⁹

Hoare was much impressed by the manner in which the project had gone ahead. In a report to the War Office he observed that 'work appears to be put through at a speed here which is unknown in England.' The rate at which the work was carried out was the result of efforts by several agencies and individuals, including the militia department, No 2 Military District, Toronto, and Colonel R.S. Low of the Ottawa firm of Bate, McMahon and Co, who had been in charge of the building of Valcartier, Connaught Ranges, and other military camps. Much of the credit must also be given to the Aviation Department of the Imperial Munitions Board, which was created to look after many of RFC Canada's needs, including construction and purchasing. Joseph Flavelle, chairman of the board, had initially selected E.R. Wood to head this department, but ill-health forced his almost immediate replacement by F.W. Baillie in January 1917. When Baillie became president of Canadian

Aeroplanes Ltd soon after, his assistant, G.A. Morrow, took over the Aviation Department.¹⁰

The Aviation Department, which had its headquarters in Toronto, provided almost all RFC Canada's physical and financial needs, including the aircraft made by Canadian Aeroplanes Ltd. It assisted Hoare and his staff in locating suitable sites for the aerodromes and schools, made arrangements for their use, provided designs for the many types of buildings required, and supervised or carried out the construction work. The department also looked after the arrangements for the many premises that were rented and leased and handled what modifications were needed. Building construction was at first placed by the department in the hands of contractors but from the autumn of 1917 it took over direct control of this work. The construction work force hit a peak of more than 2800 men during the spring of 1917. At the Armistice the department's engineering section still had more than 2200 workers on its payroll.¹¹

Even before construction at Borden had begun, other aerodrome sites had been inspected and procured. Deseronto, 130 miles east of Toronto, became the site for a new flying station, with two airfields, one on the Rathbun farm and the other, the Mohawk field on the Tyendinaga Indian Reserve, made available by the Department of Indian Affairs. North Toronto was a third section. Its fields were at Armour Heights and at Leaside, where land was obtained without charge from the town of Leaside and from the York Land Company. On 26 January a contract was signed for the construction of a large new plant in Toronto to house Canadian Aeroplanes Ltd. Before January ended arrangements were also made for RFC Canada to use the Long Branch field.¹²

The progressive establishment of the twenty training squadrons, to be known as 78 to 97 (Canadian) Reserve Squadrons, was undertaken as 'nucleus flights' of experienced officers and men arrived from Britain at intervals determined by forecast availability dates of aerodromes and aircraft. This phased programme unfolded with remarkable smoothness, though Hoare was quite ready to take shortcuts when he felt them necessary. On 24 February, less than a month after his arrival in Toronto, with the new airfields under construction and members of the first nucleus flights still on their way across the Atlantic, Hoare made the sudden decision to start flying. This resolve, taken at a peaceful Saturday lunch, so shook his staff that one member of it was able to recall Hoare's words clearly: 'We have two machines at Long Branch. We have enlisted some cadets and airmen. Why the hell are we not flying? I want flying training started by Monday!' On Monday a party led by Lieutenant John Aird began the assembling of the first JN4 at Long Branch, and on 28 February the unit, called 'X' Squadron, began flying. By the middle of March there were nine cadets undergoing flying training at Long Branch.¹³

Hoare was to deviate from orthodox routine many times during the period of his command, almost invariably with profitable results. At the same time, however, he developed an administrative structure which was both efficient and elaborate – necessarily so because functions carried out by the War Office in Britain for comparable training formations had to be done by RFC Canada itself. The organization was run from its headquarters in Toronto. Two branches reported directly to

Hoare: Air Organization, headed by Major Allen, which was responsible for administration, training, and personnel, and Aircraft Equipment, headed by Hoare's brother, Lieutenant-Colonel F.R. Gurney Hoare, responsible for technical and supply matters.

Out of this headquarters was created a series of units which underpinned the operations of the training scheme and grew with it. The Stores Depot, which acted as the general receiving, distributing, and clearing house for RFC Canada, was formed in February 1917. During that year it acquired or had built a number of buildings close to Canadian Aeroplanes Ltd on Dufferin Street. As well as handling and storing material, its personnel inspected shipments purchased by the Munition Board's Aviation Department and forecast the requirements of the many units within RFC Canada. The depot handled over twenty thousand different items from socks to aeroplane propellers. At the time of the Armistice its staff consisted of seventeen officers, 217 other ranks, and 184 women employees.¹⁴

The Engine Repair Park was formed in the spring of 1917 and at first occupied the quarters on Atlantic Avenue which had been vacated by Canadian Aeroplanes Ltd. The park was forced to train a large proportion of the men it received and this delayed its output of overhauled and repaired engines received from the training wings. Its production began modestly in July 1917 when four overhauled engines were shipped out but thereafter its output rose rapidly, reaching a monthly figure of sixty before the end of the summer. By the Armistice the unit had carried out complete overhauls of 1325 aircraft engines, all but thirty-five being Curtiss OXs, a monthly average of more than sixty-nine. Each such overhaul represented some three hundred manhours of work. RFC Canada, although enthusiastic about the Curtiss OX, considered the cost of engines and spare parts as 'inordinately high' and at times was worried about deliveries. As a result, the Engine Repair Park turned its hand during 1918 to the production and assembly of the OX. Before the war's end a point had been reached where of the several hundred individual parts of the engine, only twenty or so had to be purchased. The remainder were produced by the park and assembly was carried out with the aid of the purchased spares. The park remained at its Atlantic Avenue premises until September 1918 when it moved into larger and better equipped quarters on King Street in Toronto. Uniformed personnel strength stood at 125 at the war's end.¹⁵

It had been intended originally that repair of aeroplanes would be carried out at the wings. After flying began at the new airfields, it soon became apparent that the wings could not undertake all repairs, particularly major jobs resulting from serious accidents. By the end of July over fifty aircraft had been 'written off,' and to meet this exigency a centralized repair unit was formed in early August, quartered in the Central Prison buildings. The Aeroplane Repair Park's job was to handle the remains of serious accidents and to carry out major overhauls, required after a machine had logged four hundred hours flying time. This latter task called for a complete dismantling of the aeroplane. All parts were inspected and replaced or repaired as necessary before reassembly of the machine. The unit's formation greatly reduced the number of aircraft 'written off,' all machines damaged beyond the repair capability of the wings being sent to the repair park. Such machines were, like those undergoing a 400-hour overhaul, completely dismantled. All parts

were then inspected, feasible repairs were carried out, and the various items were then used for rebuilding machines for issue to the wings. Ultimately a salvage rate of 60 per cent was attained from badly smashed aircraft sent to the park. The Repair Park was able to make many JN4 parts itself and during the early summer of 1918 its salvage and production of components reached a point where the training scheme no longer needed to order complete JN4s from Canadian Aeroplanes Ltd. Instead, the aircraft plant supplied the repair park with only a limited range of parts and the park was able to produce sufficient JN4s to meet the training scheme's requirements. The unit's activities reached a peak in July 1918 when it turned out 130 rebuilt machines during the month. The Aeroplane Repair Park shared to some degree with the flying units the responsibility for aircraft serviceability, which throughout 1917 averaged less than 40 per cent. Thereafter it rose steadily and eventually stood at a highly creditable 79 per cent.¹⁶

A Mechanical Transport Section was formed in Toronto during March 1917 with a staff of one officer and fifteen other ranks. The section was responsible for providing motor transport services for the entire training scheme, subsections being established at the wings and other outlying units. Normal repair work was handled by these wing and other MT units while the central establishment in Toronto undertook major overhauls. The section's first home was in rented premises in the Wolseley Garage and in August 1917 the unit moved into a new and larger building on Dupont Street. Still larger quarters were obtained on Avenue Road in October 1918, the Dupont Street building being retained as a repair shop. By that time the section operated about four hundred vehicles, including staff cars, trucks of various types, gasoline tank trucks, fire engines, motorcycles, and ambulances. The last-named were heavy specially-built vehicles on Packard chassis and they carried axes, saws, heavy wire cutters, fire extinguishers, and other equipment for extricating the occupants of a crashed aircraft. Regulations called for one of these ambulances to be positioned on the aerodrome's edge at all times when flying was under way and it was not long before the cadets dubbed the vehicles 'Hungry Lizzies.'¹⁷

A Royal Engineers' Section was also formed as part of the headquarters in 1917 to look after repair and maintenance of the many buildings and facilities RFC Canada was acquiring. Two engineer officers had already been sent out, shortly after the advance party arrived. Major Osborne C. Macpherson, who was an 1891 Royal Military College graduate from Ottawa, commanded the section in 1918. Ground Tradesmen attached to the section were posted to the several stations of the RFC, where they served under Royal Engineer NCOs. The RE Section, with an authorized establishment of 135, lasted until August 1918 when, because of a shortage of men of military age with the required trades, its duties were taken over by the Aviation Department of the Imperial Munitions Board.¹⁸

Some prominence has been given to the organizational structure of RFC Canada because its nature reflects not only the normal outlines of any military training establishment, but also the special requirements stemming from the impact of warfare upon a new form of technology. The purpose of the organization was twofold: to teach young men – most of them knowing nothing of aviation – to fly and then to turn them into combat flyers in numbers sufficient to meet the inexorable demands of the air war.

The instrument chosen for the purpose was the JN4, to be built by Canadian Aeroplanes Ltd. The company began production in space leased from the John Inglis Company, previously occupied by Curtiss Aeroplanes and Motors Ltd. Meanwhile, construction of a new plant on a nine-acre site on Dufferin Street began in February, and Canadian Aeroplanes was in its new quarters by early May. Well before this, in January, the prototype was test flown by Bert Acosta, a former instructor at the Curtiss School, and was formally accepted by the RFC.¹⁹

The JN4 was a two-seater biplane powered by the Curtiss OX, a water-cooled V-8 engine produced in the United States. It had a maximum speed of about 75 mph and cruised at 60 mph, with an endurance of slightly more than two hours. The aircraft was twenty-seven feet in overall length with an upper wing span of slightly more than forty-three feet, the lower wing being nine feet shorter. The JN4 was a modified version of the American Curtiss JN3, incorporating a number of design changes requested by the RFC. For example, the lower wings were fitted with ailerons rather than relying on wing-warping to provide directional control. Sitka spruce and ash were used for the construction of the fuselage and the wings, the tail assembly was made of tube steel, the engine cowling and cockpit coaming were aluminum.²⁰

The designation chosen for the Canadian-built aircraft has caused confusion ever since, because the Curtiss Company in the United States had also developed an aircraft called the JN4. Successive American versions were designated alphabetically, from the JN4A through to the JN4H. To the Americans, the Canadian 'Jenny' was the Canadian JN4D, and the American barnstormers who flew it after the war called it the 'Canuck'.²¹

For the whole period of RFC Canada's operations the JN4 remained the training aircraft. This had not been the original intention. The DH6, specially designed as a primary trainer, had gone into production in Britain early in 1917. Both the Air Board and the Aeronautics Branch of the War Office considered the DH6 superior, particularly since it could be fitted with any of the several types of engines with which pilots had to familiarize themselves during the training process. Moreover, British officials believed that the production costs of the DH6 would be less. As a result, the Imperial Munitions Board was asked to take preliminary steps for the manufacture of the DH6 in Canada.²² But Canadian Aeroplanes Ltd was not receptive to a production changeover, and Hoare, once he had assessed the qualities of the JN4, preferred it to the DH6. Though Hoare did not regard the JN4 as an ideal trainer, he found it 'fairly suitable.' By the end of July 1917 CAL had produced more than 150 JN4s for RFC Canada.²³

Important though aircraft, airfields, and ancillary establishments were, the key to the success or failure of RFC Canada lay in recruiting. The scheme could hardly have been launched at a less propitious time. During 1916 Sir Sam Hughes had committed Canada to a fifth division for the Canadian Expeditionary Force, and had spoken rashly of a sixth. By October all thought of a sixth division had disappeared as it became evident that voluntary enlistment would not be sufficient to sustain five divisions in the field. Sir Robert Borden's fateful decision to bring in conscription was not taken until May 1917, but well before then Hoare became aware that enlistments for the CEF were virtually at a standstill. He concluded that the country had been 'worked out'.²⁴

Pilot trainees, as it happened, were not hard to get at first. In August 1916 the RFC had dropped the requirement that candidates must have a pilot's certificate, and as a result Lord Innes-Ker, without any real recruiting effort, had been able to secure a large number of recruits, only some of whom had been sent overseas. There was thus a backlog of cadets eager to begin flying training.

The real difficulty lay in finding the required numbers of ground tradesmen. General Gwatkin had told Hoare as much during their initial meeting. Hoare estimated his needs at some three thousand skilled tradesmen, if the full complement of twenty training squadrons and their supporting units was to be achieved. Engine fitters and riggers were most wanted, but altogether the RFC needed men in more than twenty skilled trades. Such men were much in demand by industry and were getting good wages. What the RFC had to offer was enlistment for the duration, including the obligation for overseas service if required, at rates of pay from \$1.10 a day for third-class air mechanics to \$2.80 for warrant officers, 1st class, plus separation allowances that ranged from \$20 to \$30 monthly.²⁵

The militia department could not be of much help. Hoare reported to the War Office that he had 'attended a Conference of 200 Officers ... and the opinion is unanimous that as far as the Militia is concerned Recruiting has ceased, and nothing short of the introduction of the Militia Act will enable them to supply further drafts.' There was nothing for it but to launch a recruiting programme in competition with industry and the militia department, and Hoare decided to embark upon one, while warning the War Office that 'there will be very great difficulty.' RFC recruiting offices, equipped to give trade tests, were opened in Toronto and Hamilton before the end of January and further offices were later opened in Montreal, Winnipeg, and Vancouver. In the circumstances of the time Hoare's pessimism was understandable but in the event the RFC did remarkably well in the recruitment of ground tradesmen, mustering some six thousand of them by July 1918.²⁶

The key unit in the handling of cadets was the Cadet Wing, established on 27 February 1917. As originally constituted, the wing both received cadets and gave them ground school training, whereas in Britain the Cadet Wing, School of Military Aeronautics, and Armament School were quite distinct. Hoare's Cadet Wing was a rough equivalent of the aircrew facilities provided by manning depots and initial training schools in the British Commonwealth Air Training Plan of the Second World War. From the first, a close association was formed between the Cadet Wing and the University of Toronto. The first group of cadets were in fact attached to the Canadian Officer Training Corps at the university. Hoare and Allen visited Sir Robert Falconer, the president of the university, to inquire about the possibility of using university buildings and facilities for the training scheme. 'At first the temperature of the discussion was glacial,' Allen recalled, 'but gradually Sir Robert thawed as he began to get the request into proper perspective. Eventually he agreed in principle. As we walked out Frog [Hoare's nickname] said: "I felt just like I did when I was sent for by the Headmaster at Harrow."' ²⁷

The Cadet wing began with a class of fifty-two and a small staff, which introduced the cadets to drill and military discipline and taught them such subjects as artillery observation, aircraft rigging, and aero-engines. At this stage the training

was severely limited by the lack of instructors and suitable instructional material, though Hoare was promised more instructors both by the War Office and by the Canadian militia department.²⁸

Shortly after both ground and flying training had begun, Hoare secured a modification in the programme which drastically altered the nature of the RFC scheme. When he left England he had been instructed to bring his cadets up to seven hours' solo time; they would receive advanced training overseas. In mid-February, after taking stock of his situation, he informed the War Office that once all training squadrons were in operation, their capacity would outstrip the likely supply of cadets. He recommended that a full training programme be instituted, so that graduates of it could go directly to service squadrons after arrival overseas. To get round the lack of an advanced training aircraft, he suggested that Canadian Aeroplanes might be able to manufacture a single-seater of advanced type, using the Curtiss engine. The obvious economies of this proposal found favour at the War Office and Hoare was told to recast his plans so that the entire range of pilot training then being offered in Britain could be undertaken in Canada. It was assumed that Canadians graduating from the scheme would need only a few hours' training on the service machines of the squadrons to which they were posted.²⁹

The new arrangements meant longer and more varied flying training for cadets, as well as a much more comprehensive ground school curriculum. In making the needed changes, Hoare showed his usual administrative flexibility, creating new units at modest levels of staffing and training content which could be rapidly expanded when the promised instructors and material came from England. To train cadets not merely to fly but to become competent in cross-country flying, wireless, aerial photography, aerial gunnery, and artillery co-operation required specialist instructors from Britain. In the interim, the amount of flying time given students was increased. After a group of officer and NCO gunnery specialists arrived in April, a School of Aerial Gunnery was formed on 1 May at Camp Borden. Its beginnings were small. A first class of eighteen cadets did a limited amount of ground range firing on one of the school's two machine guns. As equipment came in from Britain and new instructors were trained, the school expanded. No 80 Squadron was designated as a gunnery unit and aerial firing with Lewis guns started in early June. Camera guns were received in July. By autumn the course was set at three weeks, and cadets were doing aerial firing with fixed Vickers machine-guns after synchronizing gear had been designed for the JN4 so that the gun could be fired forward through the propeller arc.³⁰

A similar process marked the expansion of ground training. Since it was impossible to establish immediately a school of Military Aeronautics on the model of Reading and Oxford in England, Hoare formed an interim school at the University of Toronto, under Second Lieutenant Brian A. Peck, a Montrealer who had served

* The War Office eventually turned down Hoare's proposal for a more advanced trainer. This meant that the full training programme had to be carried out with an elementary trainer, the JN4. Probably because of this, graduates of the RFC Canada scheme needed more than 'a few hours' of service training. Fifty Canadian trained pilots who arrived in England in late July 1917 underwent at least two months more training before joining service squadrons in France.

with the Canadian Expeditionary Force for two years before joining the RFC and flying briefly on the Western front in the fall of 1916. Only on 1 July, the necessary staff having arrived, was this school designated No 4 School of Military Aeronautics. Henceforth it provided the full range of ground instruction then considered requisite, covering aircraft engines, rigging, wireless, artillery observation, machine-guns, aircraft instruments, and bombs. The school also supervised the trades training given at Lippincott Technical School in Toronto to many of the men who had enlisted for ground duties.³¹

By this time the RFC's use of university accommodation had expanded to include Burwash Hall and the East Residence of Victoria College. To lessen congestion, the Cadet Wing was detached from the School of Military Aeronautics and relocated at Long Branch field, where incoming cadets lived under canvas throughout the summer. In its new form the Cadet Wing introduced recruits to military discipline and law, provided drill instruction and physical training, and gave elementary instruction in topography and wireless.³²

As we have seen, flying had begun at Long Branch in late February. Though the RFC did not officially take over its new aerodrome at Camp Borden until 2 May, flying there began much earlier. The nucleus flights for three squadrons arrived in early March; on 16 March 79 Reserve Squadron was formed at Camp Borden, and a headquarters staff moved in the same day. The erection of the first JN4s to be shipped to Borden dovetailed neatly with the arrival of the first group of cadets on 28 March; flying began two days later. By 10 April there were five squadrons in being, 78 to 82, much understrength when formed but building up as graduates were retained to serve as instructors and as other officers and men were obtained from British and Canadian sources.³³

Camp Borden, the largest of the RFC's flying establishments, was the first of the new fields to commence training, but the others were not far behind. At Deseronto, where construction did not begin until 20 April, wing headquarters moved into town on 24 April. On 1 May 'X' Squadron moved from Long Branch to Camp Rathbun; by the middle of the month five squadrons had been formed. 'X' Squadron shared Camp Rathbun with 86 Squadron, while 83, 84, and 87 were at Camp Mohawk. For the summer all ranks slept under canvas.* Flying began at the two North Toronto fields in early July, the squadrons consisting of 'Y' Squadron from Long Branch, 88, 89, and 90 Squadrons, which had been formed at Deseronto before moving, and 91 Squadron.³⁴

By the time the first unit moved to North Toronto all cadets under flying training were receiving the extended aerial instruction now demanded of RFC Canada. Deseronto and North Toronto concentrated upon primary instruction, while the squadrons at Camp Borden were assigned specific advanced training tasks. No 80 Squadron continued as an aerial gunnery unit; 78 and 82 Squadrons specialized in wireless and in artillery observation; 79 and 81 Squadrons handled aerial photography and formation and cross-country flying.

* They included Captain Vernon Castle who with his wife Irene had made up a renowned dance team in prewar years. Castle, who had Western Front experience, commanded a squadron at Camp Mohawk. He was killed in a Texas flying accident in 1918, but his personality, his pet monkey, and his Stutz Bearcat figure largely in the memories of those who flew at Mohawk in 1917.

As the training scheme moved into high gear it was already producing its first graduates. A group of eighteen had completed training in May and sailed for overseas on 16 June, from which time their appointments as second lieutenants were dated. 'As pilots they are ... far above the average,' Hoare wrote the War Office. 'They have all over 50 hours air experience, a good proportion "loop" well, they have a good general knowledge and I feel sure will be a credit to the Corps.' Five weeks later a second draft of fifty cadets, all of whom had passed through advanced training at Borden, left for overseas, and such sailings soon became routine. Not all graduates departed, however. It was the permanent policy of RFC Canada to retain likely pilots as instructors, and so of the 167 cadets who had completed training by late August, fifty were held in Canada.³⁵

RFC Canada had concentrated initially upon the recruitment of ground tradesmen. In May, however, it began what Hoare termed 'a proper campaign' for cadets. Its chief ally was an off-shoot of the Canadian Aviation Fund, the Aero Club of Canada, formed in December 1916 under the presidency of William Hamilton Merritt to 'encourage various forms of aviation, to develop the science of aeronautics and kindred sciences ... to issue pilots' licenses to qualified aviators, and to assist those desirous of taking up aviation with a view of serving in the war.' Through the Aero Club the RFC built a national recruiting organization not dissimilar to that used by the Canadian Expeditionary Force. Citizen committees were eventually established in every community of more than ten thousand (in smaller centres one-man 'committees' were set up) and Canada was divided into five recruiting districts with headquarters at Halifax, Montreal, Toronto, Winnipeg, and Vancouver. Each district had two recruiting officers; candidates were interviewed by the committees and if recommended were examined by the local standing medical board, whose services were made available by the militia department. Those who passed were given transportation to Toronto.³⁶

In competing with the army for recruits the RFC had certain distinct advantages. The heavy casualties among military aviators were not nearly so well known as those among subalterns in the CEF. Moreover, military flying still had a glamour that Ypres and the Somme had dispelled for the army. On the other hand, public awareness of the flying services was uneven. There was much truth in Hoare's observation that 'outside of Toronto very little is known of the R.F.C.' Many believed that becoming a pilot was an expensive business, and that it was still necessary to have a pilot's certificate. To dispel misconceptions the RFC launched an advertising and news management campaign with special attention to the colleges and universities. The staff organized press visits to the training camps, prepared press releases and feature stories for the newspapers, and embarked on an ambitious display advertising programme in the press. Whether such advertising was valuable in itself the RFC was unsure, but it 'served to stimulate the newspaper, and thereby helped in the placing of news items.'³⁷

RFC correspondence and public pronouncements made clear the kind of recruit sought. Ideally, he should be between eighteen and twenty-five years of age, have matriculated from high school, and have spent a couple of years at university. He should be well grounded in algebra and geometry, be able to 'speak the King's English,' and bear 'the ear-marks of a gentleman.' Above all, he should be 'very keen to join the Royal Flying Corps.' What the RFC was after was a combination of

gentlemanliness, educational attainment, mechanical aptitude, and physical excellence, with a measure of recklessness thrown in. As a staff officer told the *Toronto Mail and Empire*, 'the type of fellow wanted as a pilot ... is the clean bred chap with lots of the devil in him, a fellow who had ridden horses hard across country or nearly broken his neck motoring or on the ice playing hockey.' The RFC was to find that not enough of such paragons, whatever their numbers in Canada, were available to sustain the training scheme.³⁸

One reason was the counter-attraction of the Royal Naval Air Service. Though its intake in 1917 was little more than three hundred, the RNAS was enlisting first-class candidates and Hoare soon came to believe that the country was too small for both organizations. He was particularly nettled when he learned in April that more naval pilot trainees were being sent to England than RNAS schools could absorb. In a recent draft of sixty-two, only forty were taken, and the remainder were given RFC commissions and sent to the School of Military Aeronautics at Reading.* Hoare feared that such actions would 'put our own cadets' noses out of joint,' especially since the War Office had also agreed to accept, on the same terms, an additional 124 probationary flight officers who were awaiting passage from Canada to England. He agreed with the War Office opinion that the RNAS was recruiting better pilot material in Canada, largely because it could offer immediate appointments as probationary flight officers, rather than the cadetships of the RFC. '... the RNAS take advantage of our publicity campaign,' he said in one of his repeated complaints, 'and without doing a hand's turn themselves can take the pick of our Cadets.' RNAS competition particularly irritated Hoare because for most of 1917 the recruiting of cadets in Canada fell much below his estimates. More and more his thoughts turned to the United States as a possible source, though initially he had rejected any active campaign there because 'there is considerable feeling between Canadians and Americans, and taking American Cadets would not be entirely popular.'³⁹

The enlistment of American citizens in the Canadian and imperial forces had been going on since the beginning of the war. The whole subject had been treated with much caution by the British and Canadian governments, since both were wary of displeasing a great neutral power whose friendship was vital and whose adherence to the allied cause was much desired. The policy to be followed had been laid down by Sir Edward Grey at the Foreign Office in the early weeks of the war. It was to respect 'the traditional policy of the United States government.' The statutory basis of that policy was the Foreign Enlistment Act of 1818, which made the recruitment of American citizens on United States soil for service against a friendly state a criminal offence. Not only had the United States strenuously

* Admiral Kingsmill received orders from the Admiralty to halt, until further notice, the shipment of RNAS recruits to England in March 1917. Before receiving the order he had already dispatched the draft of sixty-two referred to, and there remained in Canada a sizable group of accepted RNAS candidates awaiting appointments as probationary flight officers and passage overseas. They were given the choice of waiting in Canada until the Admiralty required more recruits or of going overseas immediately for service as second lieutenants in the RFC. The fifty-five who opted for RFC service were appointed RNAS probationary flight officers prior to embarkation and on arrival in England in May were transferred to the RFC as second lieutenants.

upheld that policy; during the Crimean War it had extended it beyond actual recruiting to the offering of any inducement which would entice Americans to go abroad to enlist. Nevertheless, Grey specifically reserved the right of the British government to accept as a recruit any American citizen who presented himself for enlistment on British territory.⁴⁰

Grey was speaking only for his own government. The Canadian government was informed of the position he had taken when the War Office passed to the Foreign Office an enthusiastic series of cables from Sam Hughes, who reported that 'thousands of Americans' were offering themselves for military service, and that he had 'a plan whereby they may reach Canada voluntarily.' At the same time it was made quite clear that the matter was one which the Canadian government must decide for itself.

The stance Borden adopted was even more cautious than that of the British. He discouraged any enlistment whatever of Americans in Canadian Expeditionary Force units, thus ending Hughes' vision of an 'American Legion' of sixty thousand volunteers. Only when he was assured by Sir George Perley, from London, that Kitchener was anxious to encourage American volunteers did he permit American entry into the Canadian forces. As a result, thousands of Americans entered the CEF in the ensuing years and by 1916 several battalions, exclusively American in composition, were being formed. It was this development, plus the zeal of Canadian recruiters at a number of border points who were undoubtedly luring Americans across the line with a variety of inducements, that brought Borden into conflict with the Governor General in the summer of 1916. The Duke of Connaught believed that any enlistment of Americans was a breach of imperial policy, that in any event it endangered relations with the United States, and that by accepting Americans Canada was putting into uniform untold numbers of German agents. His remonstrances, he complained, had been treated with 'persistent neglect' by the Canadian government.

Responding to the Governor General, the Prime Minister took a high constitutional line. Canada was 'a nation possessing complete powers of self-government,' and its right to enlist American volunteers was incontestable. When Connaught endeavoured to interpose his authority as 'a Field Marshal in His Majesty's Forces,' Borden coolly replied that 'the matters under consideration do not call so much for the exercise of military skill ... as the consideration of international law and the exercise of the common-place quality of common sense.' Nevertheless, he took pains to curb abuses in Canadian recruiting practices which might provoke adverse American reaction.⁴¹ It was into this delicate area that the commander of RFC Canada proposed to venture. The course of action he pursued was a flagrant breach of the policy of both the Canadian government and his own, even though it came after the American declaration of war in April 1917.

In his projections for the air training plan Hoare clearly counted upon American volunteers, who were coming to Canada to join the RNAS and the RFC long before he had arrived on the scene. When the results of Canadian recruiting proved disappointing and when American entry into the war appeared to threaten the end of that source of supply (acceptance of American volunteers might even be forbidden by the War Office), Hoare mounted his own campaign. He had to convince

the War Office that the situation was serious enough to give him a free hand and to persuade the right people in the United States not only to allow him to accept American volunteers but actually to recruit them in American territory. He was successful because of his own peculiar position in Canada, his remarkable personal qualities, and the opportunities presented for the exercise of his talents in the enthusiastic and disorganized atmosphere of newly-belligerent Washington.

In June 1917 Hoare told Brigadier-General L.E.O. Charlton, Director of Air Organization and the officer to whom he reported, that the recruiting campaign in Canada was in desperate straits: 'It is essential to take them from the States; this country has been largely drained already, and apart from quality I shall have difficulty about numbers. The fact is that I should have started a Cadet campaign 3 months ago had I known this situation would arise. As it is, owing to my rejections being about 60% and my being debarred from 280 Americans with whom I have corresponded and who were always a blank cheque ready to be filled in, I am short.'⁴² Yet a way out of the dilemma was at hand. At the end of May Hoare had received a visit at Camp Borden from Brigadier-General George O. Squier, Chief Signal Officer, United States Army, who commanded the American air service. Squier seems to have fallen under the magnetic spell of Hoare, because during the visit he agreed to the opening of an RFC recruiting office in New York City. On 30 May Hoare cabled the War Office: 'General Squier now staying with me authorizes me to say that there will not only be no objection on the part of the Air Board of the United States of America but he considers it a good arrangement ... If I cannot utilize the admirable material now available in the United States of America the quality of my cadets will deteriorate and I am not yet prepared to say that we can even obtain the quantity sufficient for four Wings in Canada. Colleges are closing down'⁴³ All that was needed, Hoare told Charlton, was the approval of the War Office: 'there is little doubt that if I can be given a free hand I can make all arrangements for Cadets from the U.S. without any friction.'⁴⁴

On the assumption that he would get a free hand, Hoare went ahead with his American arrangements. Working closely with the British Recruiting Mission, established in Washington shortly after the American declaration of war to enlist British subjects domiciled in the United States, he secured quarters on Fifth Avenue in New York City, transferred a recruiting staff there from Canada, posted 'some picked R.F.C. men at the door,' and began quietly to circulate among 'a large number of the best sort of people.' Ostensibly seeking British subjects, Hoare was in fact recruiting American citizens under cover of the British Mission, and with the connivance of American and British authorities. He summed up the position to Charlton in a letter of 28 September 1917: 'The situation is this: the British Recruiting Mission has given a written undertaking not to recruit American subjects; that I can do so is entirely due to personal influence at Washington, and though I think I can carry it through, I cannot possibly give you a definite assurance.'⁴⁵

General Charlton had consented to this scheme at the end of June, but had urged his enterprising subordinate not to relax his efforts to fill the training establishment with Canadians, 'the proper source of supply.' He also requested a forecast of recruiting prospects in Canada. Hoare was not encouraging: 'All estimates

break down ... it is a small population in a very big country. I am increasingly doubtful whether they exist in the numbers we require, I do not think it is because they will not come forward. Some of the local committees are excellent, others are lethargic but being voluntary organisations we have to put up with it.⁴⁶ By late September half of Hoare's cadet intake was American. Yet he knew that the New York operation hung by a thread: 'an arrangement which rests on an unofficial and personal basis must be a doubtful factor.' In fact, he had a surprisingly long run. Not until 6 February 1918 did he regretfully report that 'the State Department has been on my track ... I shall have to stop enlisting American citizens as Cadets,' a turn of events he attributed to 'sentiment and Congress.'⁴⁷

It had been a remarkable enterprise. Under the nose of the Canadian government, but apparently without its knowledge, a British officer, with the knowledge and consent of his superiors, had conducted from Canada a quasi-diplomatic operation utterly at variance with Canadian policy, and furthermore, had got away with it. When the Fifth Avenue office closed, the recruiting crisis had passed. Canadians had already begun to enter the RFC in much increased numbers and the need for clandestine measures had ended. It must not be imagined that Hoare had hoodwinked the guileless Americans. His first meetings with General Squier and others concerned with American aviation had been in early April 1917, when he was requested by the British ambassador in Washington to discuss air matters with American officers and government officials. Though the War Office had instructed him not to commit himself, out of these meetings stemmed a number of agreements for mutual assistance, of which the recruiting venture was only a part. For example, Hoare received assurances that there would be no interference with the supply of aircraft engines to Canadian Aeroplanes Ltd. The Americans, for their part, were anxious to profit from RFC training methods. In April Lieutenant-Colonel John B. Bennett, Chief of the Aviation Section, and Major Benjamin D. Foulois, later General Pershing's Chief of Air Service, visited Toronto and Camp Borden to study RFC Canada's structure. They were followed by Major Hiram Bingham, late of Yale and now charged with setting up a preliminary ground training programme, leading a party of eighteen American university professors. After a week in Ontario they returned to the United States burdened with training materials. Shortly afterwards schools of military aeronautics, patterned after the Toronto school, were opened at six American universities.⁴⁸

A much more ambitious form of co-operation arose directly from General Squier's visit in May. For some time Hoare had been concerned that the harsh Ontario winter would severely curtail flying training. He had investigated and rejected New Brunswick as an alternative, because it was 'a wilderness and quite unsuitable, besides being very cold.' British Columbia seemed more promising, despite its heavy rainfall and the scarcity of good airfield sites. After a visit by two RFC staff officers in February, it was decided to lease two properties south of Vancouver, one at Steveston on Lulu Island and the other at Ladner on the south arm of the Fraser River. Though construction was started, the RFC never used either field. A much more intriguing possibility had offered itself.⁴⁹

General Squier had mentioned to Hoare that the military flying schools about to open in the United States were short of instructors and had asked whether RFC

Canada could assist. Hoare leaped at the opportunity for a *quid pro quo*. On 4 June he cabled the War Office for approval of 'a reciprocal arrangement which I can make with Washington by which we would train One Hundred Cadets for them this summer and they will make a winter camp available to us in the States complete with machines.' Hoare's intention was to move the Borden Wing to the United States for a three-month period of training, the wing to use JN4s purchased from Canadian Aeroplanes Ltd by the Americans.* With War Office approval in principle, and support from the Imperial Munitions Board, Hoare left for Washington 'to get everything definitely settled.'⁵⁰

By 22 June Hoare had successfully concluded discussions with Squier and with the Aircraft Production Board, a body of which he was made an honorary member. Hoare had agreed to take a hundred American cadets; in exchange, the Americans agreed to build an airfield in a warm climate to receive an RFC Canada wing. The airfield would be fully equipped according to RFC specifications and would be available for use from December 1917 to the end of February. The only modification made to this plan in the formal agreement reached between the American War Department and the War Office in London was American consent to provide winter training facilities for two wings instead of one.⁵¹

Hoare's observation of the state of American aviation led him almost immediately to propose a second scheme. The Aviation Section of the Signal Corps, he found, was undoubtedly recruiting excellent material, but the Americans were in no position to train recruits and organize squadrons within a reasonable time. He therefore secured War Office agreement in principle to a proposal that RFC Canada would train sufficient air and ground personnel to organize ten squadrons, that these squadrons would be allotted to work with the RFC in France, and that the United States would be responsible for maintaining them. He assured the War Office that he could so arrange matters that the proposal would appear to emanate from Washington.⁵²

On 9 July Hoare placed his proposal before the Aircraft Production Board in Washington. His account of that meeting gives more than a hint of his entrepreneurial style: 'On arrival I was asked to address a meeting of their Signal Officers (as they were called then) and some chief executives of motor industries, etc. I had some ideas of a reciprocal training scheme but had not worked out detail. Before the meeting I had lunch with Col. Hiram Bingham at the Raleigh Hotel, and stimulated with cocktails jotted down some headings on the back of an envelope, Bingham collaborating. This was really where the R[eciprocal] T[raining] scheme originated. This was a great success - everything was agreed in principle and I said on return to Toronto I would elaborate in writing. I may say I pointed out the Scheme would cost them vastly more than us, but they considered that of minor importance.'⁵³ As finally approved, the scheme provided that the ten American squadrons would be issued with aircraft and other equipment after their

* Eventually the United States purchased 680 of the Canadian-built trainers. See K.M. Molson, 'Aircraft Manufacturing in Canada during the First World War,' *Canadian Aeronautical Journal*, v, Feb. 1959, 47-54; M.R. Riddell, 'The Development and Future of Aviation in Canada,' *Journal of the Engineering Institute of Canada*, II, March 1919, 200-8; Hoare to Drew, 26 Dec. 1917, Air 1/721/48/5.

arrival in Britain, and that their establishments would be increased to conform to RFC establishments for service squadrons.* RFC Canada was now committed to the training of three hundred pilots, two thousand ground tradesmen, and twenty equipment officers, in addition to the hundred cadets previously agreed upon. In return, the Americans were to provide three airfields in the southern United States, instead of the one they had previously promised. No evidence has been found to show whether the Canadian government was kept informed of Hoare's transactions, or that it was aware that the first substantial lodgment of American forces upon Canadian soil since 1814 was about to take place.⁵⁴

The first Americans to arrive in Toronto were a small party of United States Navy cadets, included in the programme as a special arrangement.[†] They arrived on 9 July and were shortly followed by the first drafts of army cadets. Enlisted men did not arrive for more than a month, then drafts of two hundred began to move in at weekly intervals. Before leaving the United States the enlisted men had been organized into squadrons, but the RFC soon discovered that they were raw recruits without basic military training who had been arbitrarily assembled into parties of the required number with scant regard for trade qualifications. Their lack of military smartness, a quality much prized by the RFC staff, dismayed those who met them. On their way from the train to the Recruits' Depot, it was said, they 'just ambled along the road like a baseball crowd.'[‡] American cadets presented no particular problem; they were simply incorporated into the training programme, though they were kept together as much as possible. The enlisted men, however, had to be given basic training, trade-tested, redistributed according to the tests among squadrons, and either given on-the-job training or sent to the RFC's technical training establishments.⁵⁵

Meanwhile, preparations had already begun for the move south. RFC staff officers had inspected areas in Florida and Texas even before the first American cadets had arrived in Toronto. Hoare's choice was San Antonio, but American concern about a possible labour shortage there led him reluctantly to accept Fort Worth. Advanced RFC headquarters was established there by a party of ninety-two RFC and American officers who left Toronto on 24 September. They were commanded by Captain Murton A. Seymour of Vancouver, who had begun his aviation career as a student at the Aero Club of British Columbia School in 1915 and had flown with a fighter squadron in France. The first batch of crated JN4s was shipped at the same time. The advance party was followed by the American cadets

* It would appear that only two of the ten squadrons flew in France under British control. These two squadrons were attached to the RAF from 20 June and 1 July 1918, respectively, and on 1 November were absorbed into the air service of the American Expeditionary Force. See S.H. Frank, 'Organizing the U.S. Air Service,' *Cross & Cockade Journal*, VII, spring 1966, 66.

† Among their number was Cadet James V. Forrestal, later United States Secretary of the Navy and Secretary of Defense.

‡ Introducing American soldiers to the British Army drill manual had its complications. Major Henry H. Arnold, later commander of the USAAF during the Second World War, was said to have 'exploded with rage when he saw a squadron of good "Dough Boys" doing a very creditable presentation of the British Slow March under one of the Depot Drill Instructors.' A pair of American drill sergeants were shortly posted to the Recruits' Depot. Allen to RCAF Historical Section, 22 July 1962, DHist 76/199

and enlisted men who proceeded in drafts to the Texas fields to continue their training. Grouped into the 17th, 22nd, 27th, 28th, and 139th Aero Squadrons, they left Toronto at weekly intervals commencing on 12 October.* With them went RFC instructional and support personnel, including the staff of the School of Aerial Gunnery. The thirty machines flown by the school were shipped as well, the only aircraft of its own that the RFC took to Texas.⁵⁶

The main RFC move began on 15 November, when the staff and cadets of 42 (Borden) Wing and 43 (Deseronto) Wing pulled out of Toronto aboard six special trains. They arrived in Fort Worth on 17 November. The whole complex there was known as Camp Taliaferro, with three aerodromes, Hicks, Everman, and Benbrook Fields. Everman and Benbrook were occupied by 42 and 43 Wings, respectively, while Hicks Field accommodated the five American squadrons and the School of Aerial Gunnery. As each American squadron completed its training at Hicks Field (the first was scheduled to leave for overseas in mid-December), it was to be replaced by another, formed from American personnel dispersed throughout the RFC units at the other two fields.[†] At the same time, the RFC was to carry on the training of its own cadets in normal fashion, with new drafts arriving from the School of Military Aeronautics in Toronto at phased intervals.⁵⁷

Initially things did not go smoothly. Construction work on the three aerodromes was little more than half completed, the water supply was deficient, one of the fields lacked electrical power, and the sewage systems were not yet operating. Unfinished barracks meant living under canvas. Not until early December were all aspects of the training organization in full swing. Flying, however, began immediately. For example, the School of Aerial Gunnery completed a course at Camp Borden on 30 October, spent two days packing, and left Toronto on 2 November. Its students were in the air in Texas on 5 November, the day after arriving.⁵⁸

* Twenty of the US Navy party completed the full syllabus of ground and flying training in Canada. They were the only American pilot trainees to do so.

† The 17th Aero Squadron departed two weeks later than its scheduled date, but the others left on time: the 22nd, 27th, and 28th in January, the 139th, 147th, and 148th in February, and the 182nd, 183rd, and 184th in March. Of these, all but the latter three flew operationally in France: the 17th and the 148th with the RAF and then with the 4th Pursuit Group of the Second US Army and the others with Pursuit Groups of the First US Army. S.H. Frank, 'Organizing the U.S. Air Service,' *Cross & Cockade Journal*, vi, autumn 1965, 267-8. As part of the reciprocal agreement the RFC had agreed to release a number of its experienced American pilots, and five were therefore transferred to the United States Army, where, as majors, they commanded squadrons sent overseas. Curiously enough, two of the five were unquestionably Canadians. Major Harold E. Hartney, given command of the 27th Aero Squadron, was born in Pakenham, Ont., graduated from the University of Toronto and the University of Saskatchewan, and practised law in Saskatoon before going overseas with the Canadian Expeditionary Force. After transferring from the CEF to the RFC, he flew FE2bs and FE2ds in France for eight months before being wounded. Major Laurence C. Angstrom, commander of the 139th Aero Squadron, was born in Toronto. After obtaining his pilot certificate at the Stinson School in San Antonio, he joined the RFC early in 1916 and also flew FE2bs in France. In August 1918 Hartney was promoted to lieutenant-colonel and appointed commander of the 1st Pursuit Group. See correspondence in Air 1/721/48/5; Air 2/166/RU4867; S.H. Frank, 'Organizing the U.S. Air Service in World War I,' *Cross & Cockade Journal*, viii, spring 1967, 82; Harold E. Hartney, *Up and At 'Em* (Garden City, NY 1971).

For several weeks the flying weather was ideal, and then Fort Worth experienced unusual winter conditions. The student pilots had to cope with 'northerners,' high winds combined with sudden temperature drops of as much as 50°F. Heavy rainfalls and even occasional snow turned the surface of the airfields into heavy mud. On a single day forty propellers were smashed by mud flung up and forward from the wheels of the undercarriage, and over a one-month period an average of ten propellers a day were broken, despite wire mesh guards placed over the wheels. Fortunately the periods of bad weather did not last long enough to interfere seriously with the schedule. For the most part, the facilities provided by the Americans were good, and in the case of the School of Aerial Gunnery they were superior. 'The A.G.S. here is a distinct improvement on what we had in Canada,' Hoare told the War Office, 'the U.S. have done everything we asked for in the way of ranges, etc. and in fact have spent a great deal of money for us.' The range, used for live air-to-ground and air-to-air firing, extended over the waters of Lake Worth, northwest of the city. This was the first time RFC Canada had been able to carry out live air-to-air gunnery. There was an advanced landing ground on the lake shore, cutting wasted flying time to a minimum. The school increased its hours of instruction per student from the three hours obtaining at Camp Borden in September 1917 to an average of six and one-half hours before it returned to Camp Borden in the spring, and nearly tripled its output in the same period.⁵⁹

The original agreement had specified that RFC Canada was to quit the Texas aerodromes in mid-February. Hoare had had second thoughts about that, since his training establishments would be returned to Canada with a good part of the Ontario winter yet to come. Since he and General Squier seem to have been at liberty to modify aspects of the agreement as they chose, he secured Squier's consent to an extension to mid-April, at the price of an undertaking to train eight additional American squadrons, comprising 144 pilots, 1200 men, and a number of ground officers. Delays in the arrival of these men meant that when RAF Canada (as it had then become) left Texas, training of the eight squadrons was still incomplete. Nevertheless, RAF Canada had trained or partially trained more than 4800 officers and other ranks of the American services. More than four hundred pilots had been graduated; another fifty were close to graduation. More than 2500 ground tradesmen had been trained; another 1600 had received some instruction. All this had been accomplished in addition to flight training for 1500 of RAF Canada's own cadets, most of them Canadians. Appreciation was expressed by Major-General W.L. Kenly, the new Chief of the United States Air Service, who told Hoare that RAF Canada had 'conferred a great and practical benefit on the United States Air Service.'⁶⁰

During the winter months, while the Texas experiment was under way, the Cadet Wing moved from its tents at Long Branch into the barracks vacated by the squadrons from Camp Borden and Deseronto. Both segments of the wing continued basic training at these bases until reunited in early April at Long Branch.

* The War Office had already expressed its appreciation to Hoare, promoting him to brigadier-general with effect from 1 August 1917. A statistical gauge of Hoare's work is afforded by the summary he sent the War Office on 26 January 1918, the anniversary of the inception of RFC Canada:

There new recruits once more were accommodated under canvas until autumn, when barracks were completed to house twelve hundred cadets and the wing's staff of two hundred officers and other ranks. In the summer the wing was reorganized along the lines of an infantry battalion, with a headquarters company and four squadrons. By the time of the Armistice it had provided training for nearly 6700 cadets.⁶¹

Even before the Texas move the flight training organization had been substantially altered. When RFC Canada had begun giving advanced or 'Higher' flying training, the Deseronto Wing was confined to elementary or 'Lower' pilot training. In October 1917 each wing became a composite training school giving both elementary and advanced flying training. Five squadrons were allotted to each wing, three to provide elementary training and two to give advanced training. At the same time the wings were recognized as belonging to the overall RFC training structure and were thus numbered as such. The fifteen squadrons then formed were grouped as follows:⁶²

42 (BORDEN) WING	43 (DESERONTO) WING	44 (NORTH TORONTO) WING
No 78 CTS*	No 80 CTS	No 88 CTS
No 79 CTS	No 83 CTS	No 89 CTS
No 81 CTS	No 84 CTS	No 90 CTS
No 82 CTS	No 85 CTS	No 91 CTS
School of Aerial	No 86 CTS	No 92 CTS
Gunnery†	No 87 CTS	

A further reshuffling of the wings took place shortly after the return of the Texas contingent. In the spring of 1918 42 Wing was transferred from Camp Borden to Deseronto and 44 Wing from North Toronto to Camp Borden. These wings con-

(con't from 95)	Trained and sent to England	744
	Trained and awaiting transportation	83
	Retained as instructors	138
	Commissioned and killed during instruction	6
	At Recruits' Depot	348
	At Cadet Wing	742
	At No 4 School of Military Aeronautics	753
	At 42nd, 43rd, and 44th Wings	843
	At School of Aerial Gunnery	154
	Discharges	197
	Cadets, fatal accidents	28
	Total enlisted	4036

These figures do not include American cadets trained under the reciprocal agreements. See Hoare to Drew, 6 Feb. 1918, Air 1/721/48/5.

* In June 1917 squadron designations were changed from Canadian Reserve Squadrons to Canadian Training Squadrons.

† The School of Aerial Gunnery was first operated by 80 CTS but in the summer of 1917 this squadron had moved to the Deseronto Wing and the school had been organized as a separate unit.

tinued to give both elementary and advanced training. No 43 Wing, which moved to North Toronto, was given a specialized role to be discussed shortly.

Had the war lasted into the winter of 1918-19 there would have been no need for the repetition of the shift to the United States because of what the 44 (North Toronto) Wing had learned about flying in winter conditions. Its instructors and students had become the pioneers of cold weather flying in Canada. The staff had been pessimistic. 'We had nothing to go on,' Major Allen later recalled. 'The prospect of the 44th Wing sitting on their backsides for months producing no pilots had us scared stiff.' The commander of the wing was Major J. Stanley Scott of Roberval, Que., who had won an MC as a Western Front pilot in 1916.* Under his leadership, and contending with a Toronto winter more severe than normal, the wing demonstrated that flight training in the snow and cold was perfectly feasible.⁶³

The chief technical factor in this victory over winter was the adoption of a ski-fitted undercarriage for the JN4s. Its inventor is unknown; probably the idea of replacing undercarriage wheels with skis or toboggan-like devices was one that occurred to many.† The real problem was to produce a sturdy mechanism that would stand up to rough landings by inexperienced pilots. A suitable design was achieved by joint experiments carried out by 44 Wing, the Aeroplane Repair Park, and Canadian Aeroplanes Ltd. The problem of taking off, landing, and taxiing on snow-covered airfields had been solved.

Engines and pilots also needed protection. Experiments hit upon the right anti-freeze mixture for the coolant system. On very cold nights the fuel, anti-freeze, and lubricating oil were withdrawn from the aircraft and the coolant and oil heated before being replaced in the morning. Though the electrically heated flying suits just coming into use on the Western Front were not available in Canada, adequate protective gear was devised, including chamois face masks, thigh-length flying boots, and goggles with amber-tinted glass to cut down glare from the snow.

During the winter 44 Wing flew in ground temperatures that dropped as low as 22° below zero Fahrenheit. Normal flying training proved possible at 14° below zero. There were occasional misadventures and a number of minor frostbite cases, but the morale and performance of the wing remained high. Its spirit was characterized by the determination of a student pilot who, after a forced landing in a snowy field, taxied two miles across country to his aerodrome. In the ninety-day period from the New Year to the end of March, the wing was able to fly on seventy-two days; most of its instructors were able to log an average of more than two hours' flying a day.⁶⁴

* Scott later served as Director of the Royal Canadian Air Force from 1924 to 1928.

† The Russians had already flown aircraft fitted with ski-type undercarriages. The principle went back to the beginnings of the air age. The Wrights had flown machines equipped with skids, takeoffs being made from a trolley running on fixed tracks, and most early aircraft continued to use skids. The Aerial Experiment Association's *Red Wing* had used runners for its flight from the ice at Lake Keuka. F.G. Ericson, chief engineer at Canadian Aeroplanes Ltd, had made speed runs over the ice of Lake Superior before the war on propeller-driven vehicles fitted with skis and runners. See Ericson's account in *Aviation News*, 11, Dec. 1919.

Winter flying, then, had little effect upon the length of time it took to train a pilot. At this stage of the training scheme's operation, that period, from swearing in to the passing of final tests, was about four-and-a-half months, though the exact duration was determined by weather conditions and individual rates of progress. By late 1918, because of additions to the curriculum, the average period was about six months. A circular prepared by the chief recruiting officer for distribution to the civilian committees outlined clearly the training process experienced by cadets. After tracing the cadet's path from medical examination and swearing-in to the end of his three-weeks' course at the Cadet Wing, where he was 'trained as a soldier,' the circular went on to describe the training at No 4 School of Military Aeronautics. There the cadet '... undergoes instruction in engines, care and maintenance of machines, map reading, cross country flying, and in fact in all branches of aeronautics from a theoretical standpoint. He should be able to detect from the sound of an engine whether it is running correctly or not. It is necessary for him to be expert in the assembling and truing up of the machine. He also learns the first principles of theory of flight and wireless telegraphy. He must be able to read twelve words a minute from the buzzer.'⁶⁵ On successful completion of this course, the cadet was sent to a 'Lower Training Squadron' for initial flight training.* 'The average Cadet takes two or three hours' dual control with an Instructor and is then able to go up solo. After five or six hours' solo flying and thirty to forty landings a Cadet is drafted to a Higher Training Squadron for more complete training in cross country flying, wireless telegraphy, photography, bomb dropping, artillery observation, aerial gunnery, etc. He must do at least thirty hours' solo with this Squadron, after which he is sent to a School of Gunnery. This comprises a three weeks' course on fighting in the air, manoeuvring and air tactics.'⁶⁶ Only after passing through the School of Gunnery was the cadet 'granted his commission as 2/Lt., given his "Wings" and after a short leave ... sent overseas.'[†]

This bald outline gives little inkling of the nature of the training process from the viewpoint of the cadets. What struck an American officer who went through the course was the discipline to which trainees were subjected:

All cadets are required to wear white hat or cap bands. This serves to distinguish the cadets from regulars, and makes them easily marked, when 'walking out,' for matters of discipline. There is a healthy fear on the part of the cadets for their officers, not because of any

* From May 1918, after completing the School of Military Aeronautics course, cadets were sent to the Armament School, located in Hamilton after 20 June 1918. At the school they were given a four- to five-week ground course on Lewis and Vickers guns, synchronizing gear, ammunition, gun-sights, bombs, bomb-sights, and bomb dropping. Observer trainees were given three weeks' training, chiefly on the Lewis gun. The formation of the Armament School freed the School of Aerial Gunnery (now entitled the School of Aerial Fighting) from most of the ground instruction it had previously given. See Alan Sullivan, *Aviation in Canada, 1917-1918* (Toronto 1919), 159, 166, 170-9.

† RFC/RAF Canada simply published lists of those qualified along with Daily Orders. 'No qualifying ceremony was held and no "wings" appeared,' a former cadet has recalled. 'We didn't know whether to wear them or not. The usual compromise was to have them quickly detachable and out of sight when on duty.' Gibbard to RCAF Historical Section, 8 March 1962, DHist 76/288

injustice on the part of the officers, but rather because of their firmness in all matters of discipline. A cadet failing to stand at attention when an officer enters the lecture room will find himself up for orders. Salutes must always be executed and executed properly. All regulations are rigidly enforced. Disciplinary measures are thorough. Every cadet is accorded thirty units or marks when he enters the School of Military Aeronautics. The loss of these credits renders him liable to discharge. A cadet ... for purposes of discipline may lose any number of these credits ... and be accorded an additional penalty, as 'C.B.' ... There are usually two or three men in the guard house most of the time. This punishment does not of itself render the man liable to discharge. Failure in examinations is cause for discharge, but is seldom used, some men having been given as many as four opportunities to pass them.⁶⁷

The combination of strict discipline and a lenient attitude towards failure in examinations contrasts with the policy pursued in the British Commonwealth Air Training Plan of the Second World War. Unlike the BCATP, RFC Canada cadets deficient in ground school studies or laggard in flight training were given repeated chances to pass. In the first year of RFC Canada's operations the wastage rate among cadets was only 4.9 per cent, a figure far below the 'wash-out' rate of approximately 33 per cent for Second World War pilot training in Canada.⁶⁸

On the whole, cadets gave their instructors, both ground and air, high marks. Some complained of the teaching by rote practised by NCO demonstrator-instructors. 'Some instructors on the Monosoupape engine are in no way acquainted with any other engine,' an American cadet sarcastically observed, 'and their knowledge of the fundamental physical principles of the gasoline engine is fantastic.' Other Americans found gunnery instruction by NCOs highly competent, and ' marvelled at the extent to which the British and the Canadians left the running of everything to these men.' About the officer instructors, there appears to have been no conflict of view. 'Each officer lecturing has had actual and practical military experience in the line he teaches,' one student noted. 'These officers are all returned men ... Their simple practicality and earnestness have a clearly steadying and business-like effect upon the cadets.' Most cadets seem to have found the School of Military Aeronautics a challenging experience. 'I studied harder than I had ever studied in high school and college,' recalled a cadet who had been educated at Massachusetts Institute of Technology before coming to Canada. 'My life, and perhaps the lives of others, might depend on what I learned.'⁶⁹

The promise of flight was the spur that drove most cadets through the hours of lectures and note-taking at ground school. Once posted to a training station, their keenness to fly was intense. William C. Gibbard, of Moose Jaw, Sask., went overseas as a second lieutenant in July 1917 after training at Camp Borden. His recollections of flight training are typical of the enthusiasms of that time:

Our Borden experience was frustrating, too few machines for the over-anxious cadets. Early flying (daybreak) was the rule and I recollect bugles arousing us, not often necessary. Day-break found each flight's cadets hopefully grouped round its one or two airworthy JN4's. They were taken in turn by the instructor ... He expressed his amazement at the fanatic zeal of Canadians to get flying. Said an aircraft was nothing to get lyrical over - just a mechanical

contrivance to carry us through the air ... We lived for flying and were in despair when shortages of machines, sickness, orderly duty, etc. grounded us. Outside social activity was non-existent and was not desired. No time for anything that did not further our aviating.⁷⁰

Gibbard's memories reflect the shortage of serviceable aircraft during the early days of the training scheme. Flying time was really dependent upon deliveries from Canadian Aeroplanes Ltd, and as late as June 1917 only thirty-four Jennies were received. By October, however, the factory was producing at the rate of two hundred aircraft a month, a change that enabled RFC Canada to increase sharply its monthly log of flying hours. Whereas in May only 2164 hours were flown (and only 140 in April), by September the operation was in full stride and 13,000 hours were recorded. Figures for 1918 are somewhat larger; between May and October the monthly totals ranged between 17,000 and 20,000 hours.^{*71}

No pilot ever forgets his first instructional flight. William C. Lambert,[†] who was credited with seventeen victories and won a DFC with 24 Squadron in France, remembered every detail:

Compton gave me the controls at about 1000 ft. He told me to climb to 2,000 ft., do some turns, right and left, glide down to 1,000 ft. with throttle back, then climb up again and circle the field several times. He cautioned me about my air speed. My first two or three turns were flat with very little bank and lots of skids. After several attempts, I gained confidence and began to bank as I should. In a few minutes Compton told me to glide down, throttle back, turn into the wind and head in for a landing. I did this and glided down to about 300 ft. before he took over the controls for landing. I had to keep my hands and feet on the controls to feel his actions in landing. We taxied up to the parking line and climbed out. Compton said: 'You did fair.' I thought I had done very well.⁷²

Pilots learned to fly by 'feel,' since the JN4's instrumentation consisted of an altimeter and an engine revolution counter. The instructor sat in the rear seat, and communication was sometimes awkward. A story repeated by many cadets was that when a student froze at the controls, 'some instructors were known to stand up and hit the cadet on the head with a monkey wrench or anything available.'⁷³

Dual instruction did not last long. J. Sterling Halstead, one of the United States Navy cadets trained in Canada in 1917, stated that the members of his unit soloed 'after periods of dual instruction that ran from a maximum of six hours to a minimum of 45 minutes, compared with the ten hours dual then required in the flying schools of the U.S. Army and Navy.'⁷⁴ This was a matter of policy and applied not just to the navy cadets but to all trainees. The object of the elementary training squadrons was to get their pupils flying solo as quickly as possible. Of the five or six hours' dual instruction a student received, only about an hour was away from

* The JN4 was a rugged aircraft, and the RFC flew it hard. In September 1917 each serviceable aircraft was flown an average of 105 hours. That was a peak figure; the norm was between 75 and 95 hours per month. Sullivan, *Aviation in Canada*, 20

† Lambert was a chemical engineer born in Ironton, Ohio. He worked in a Montreal explosives plant before joining the RFC in early 1917.

the airfield; most of the time was spent on landing and takeoffs. The ensign in charge of the American naval party was impressed by the system:

Once an instructor is satisfied that the cadet is not going to hurt himself, he sends him solo regardless of what he may think the cadet will do to the machine. It has been found that a man learns far more quickly by teaching himself and the instructor takes far greater chances on the pupils making a rocky take-off or landing. This policy is made possible by having unlimited spare equipment on hand. A broken undercarriage, propeller or wing should not render a machine unserviceable for more than an hour. On all sides of the R.F.C. you will find an indifference to breakage unknown at home, but nowhere more so than at the Preliminary Flying Camps ... At the same time no pupil is ever sent soloing unless the instructor feels confident that he is not going to hurt himself severely.⁷⁵

It was this system which produced the characteristic elementary flying school landscape of 1917-18, as portrayed in many photographs of the period: expanses of rolling grassland, dotted into the middle distance with JN4s in unnatural attitudes - leaning on their propellers, or wingtip to ground and undercarriage buckled, or, much less frequently, in the tangled heap that signalled a serious accident.

Ontario communities close to RFC Canada's training establishments, though at first enthralled by the romance of flight, discovered on further acquaintance that the aircraft, at least in the hands of cadets, was highly accident-prone. Such was the case in Orillia. The first aeroplane to visit Orillia arrived on 20 May 1917, when three JN4s from Camp Borden landed on the town's old racecourse. A large crowd assembled, for as the *Orillia Times* observed, 'While many Orillians are familiar with the aeroplane from photograph and description ... few have ever had the opportunity of examining one at close range.' For readers who had missed the great event the *Times* defined the JN4 as 'a motor car with small front wheels only,' having wings 'cross-wise with the car' and driven by 'motormen' - the latter term shortly to be replaced by 'birdmen.' It had two seats, 'one being for the pilot and the other for the driver.'⁷⁶

The mysteries of aviation were soon dispelled. Within a month the *Times* found that 'the novelty of aerial navigation is rapidly wearing off' since airmen from Camp Borden were making daily use of the racecourse as a practice field. Instead, readers received a steady diet of stories about aircraft from Camp Borden 'coming to grief.' Sometimes these accidents were serious and shocking; on 16 August the *Times* reported the death in a crash of Cadet A. Heyler of Midland, Ont., and on 27 September a mid-air collision in which Lieutenant Arthur Williams of Toronto and a cadet from Venezuela, John Edward Ludford, were killed. Usually, however, the mishaps were minor. On 24 June, for example, 'an immense crowd' watched as a JN4 taking off from the racecourse 'fouled a tree top' and 'hit the ground with a thud,' the pilot emerging unscathed. One of two aircraft sent from Camp Borden to provide help landed on a stump hidden in the grass. Further interest was soon provided by two aircraft which 'had the misfortune to alight head down.'⁷⁷ Eventually the passage through town of trucks bearing bent and tattered

sections of dismantled aircraft, as well as disconsolate cadets, became a customary sight for Orillians.

For the cadets as well accidents became routine. But the first solo was always an occasion. Gibbard remembered: "Solo" was the highest achievement at this stage and the subject of endless discussion in the mess to perfect the mental image of correct procedure. It nevertheless always came without warning. A series of landings ... ended with Russell stepping out and telling the cadet to take it off himself. He was usually airborne before the jitters developed. Every 1st solo had a little something extraordinary to talk about. After mine, the carburettor was found to be hanging by a thread.⁷⁸ Once a student had logged ten solo hours and made thirty landings, including one emergency landing procedure in a field away from the aerodrome, he was ready to proceed to advanced instruction. In the higher training squadrons, and in the specialized schools beyond them, was undertaken the business of converting student pilots into military aviators.

The object of these units was to build upon the ground school instruction already given, to teach the student to become master of his aircraft, and to acquaint him more than superficially with the wide range of skills required of pilots at the front. In 1918, for example, a School of Artillery Co-operation was formed at Camp Leaside under 43 Wing. The three squadrons at the field dealt only with this aspect of air operations. Training techniques were as realistic as possible. The open country which virtually surrounded the aerodrome was turned into an artillery ranging area. Smoke puffs were released on the ground to represent shell bursts and the cadet, flying at 2000 feet, had to locate them on his map, tap out a Morse message giving the map reference of each shell burst to a ground receiving station, and pass adjustments in range and direction to the 'battery.' Since wireless communication was then only air to ground, the student had also to read messages sent from the ground by Aldis lamp, ground strips, and the Popham panel.

This aerial training was bolstered by a number of ground training aids. The school had two huge maps prepared from aerial photographs of sections of the Western Front, each studded with hundreds of light bulbs which could be flicked on singly or in combinations to represent shell bursts from one or more batteries. The cadets sat on elevated benches above the maps, noting shell bursts and passing information by 'buzzer' to the instructor. Similarly, contact patrol instruction was given on a map on which three trench lines, machine-gun emplacements, and other features were represented.

The Artillery Co-operation School also gave instruction in bombing, using the camera obscura method. The student flew towards a designated target, adjusting his bomb sight for the correct altitude, airspeed, and heading of the aircraft, and for estimated wind speed and direction. When he believed the target to be within his sights, he sent down a wireless signal to simulate the dropping of a bomb, while an instructor, watching the aircraft's reflection in a 'target' mirror, could determine from the position of the reflection the accuracy of the student's aim.⁷⁹

An already existing school, the School of Aerial Gunnery, acquired in 1918 a new home, more challenging standards, and a new name. Before the school had been moved to Texas, plans were already under way to find it a new aerodrome. The place selected was the village of Beamsville, a Niagara Peninsula community

on the Lake Ontario shore some twenty miles southeast of Hamilton. The Imperial Munitions Board leased a site and carried out construction of an airfield and necessary buildings and facilities during the winter of 1917-18. Apart from British Columbia, Hoare reported to his superiors, this was the warmest part of Canada and he was confident that he would get 'a more complete school' going there in the spring.⁸⁰

On its return from Texas the school moved directly to Camp Beamsville. It then consisted of three squadrons with a total establishment of fifty-four aircraft. From the start the school introduced new training techniques. Shooting at static targets on the range was discarded in favour of travelling targets, so that students could immediately become accustomed to deflection sights and deflection firing. The same approach governed air exercises in which the student, armed with a camera gun, endeavoured to register in his sights a JN4 flown by an instructor while at the same time avoiding being 'shot down' himself. The proximity of Lake Ontario made possible air-to-air firing with live ammunition at towed drogues. Air-to-ground firing practice included shooting at full-size silhouettes of aircraft mounted on rafts, at a heavily-armoured motor launch, and at dummy trenches. In its last months the school, by this time known as the School of Aerial Fighting, attempted to simulate, so far as the JN4's performance would permit, the conditions of actual aerial combat. The commandant, Major A.E. Godfrey of Vancouver, and the commissioned instructors were all former combat pilots, and their experience was now used directly in the training curriculum.⁸¹

In 1918 the whole approach to the training of pilots was similarly influenced by lessons derived from the fighting fronts and the need to bring a new realism to flying instruction. This approach was pioneered by Major R.R. Smith-Barry at Gosport and at the Central Flying School at Upavon in England. After having commanded a fighting squadron in France, he took over a training unit at Gosport on the south coast of England, and there developed the training system which made him the most influential instructor of his time. Too many poor pilots were reaching France, he believed, where they were of no use to their squadrons and sitting ducks for the enemy. The blame for this rested squarely upon the training systems. His prime cure was to dispel the cloud of ignorance about the nature of flight and the capabilities and behaviour of aircraft in which most pilots were enveloped. As he said in his best known training pamphlet, some experienced pilots might consider his methods heterodox, 'but most, it is thought, will consider them quite normal, and indeed rather old-fashioned.'⁸²

Until Smith-Barry's time, the mind of the fledgling pilot was filled with taboos about flying. For the student, and often for the instructor, flight itself was unnatural. An aircraft in flight was in precarious balance; any deviation from rote procedures brought sudden, irreparable disaster. Pilots learned to fly by the seat of their pants. Survival of initial flight training and the accumulation of experience brought increasing skills and a greater knowledge of dangers, but no added understanding

* RAF Canada began training observers in June 1918. To do so, a fourth squadron was added at Beamsville. The observers worked almost exclusively with Lewis guns on Scarff mountings in the rear cockpits of the JN4s, though they also used camera guns.

of why, in certain attitudes, an aircraft behaved as it did. Smith-Barry's approach was to encourage instructors and students to fly at the limits of their aircraft's capacities, to experiment with the controls of the aircraft when in abnormal or unusual attitudes, and thus to build up the knowledge, confidence, and skill needed to meet any exigency in the air. He put it as follows:

The object has been not to prevent flyers from getting into difficulties or dangers, but to show them how to get out of them satisfactorily, and having done so, to make them go and repeat the process alone. If the pupil considers this dangerous, let him find some other employment, as, whatever risks I ask him to run here, he will have to run a hundred times as much when he gets to France. How can a young officer be expected to do very much in France, if, during the whole of his training in England he has been told of nothing but what it is considered dangerous to do in flying? As most of the supposed dangers are not dangerous at all, but both easy and pleasant, it would seem a simple matter for the pupil to be taught, chiefly by example, to be frightened of nothing connected with flying on this side of the lines.⁸³

Smith-Barry placed a much heavier emphasis upon the theory of flight than had previously been the case, and also sought to give practical demonstration of its principles in the air. As one of his staff recalled, 'the gospel he preached was that the aeroplane was a nice-tempered, reasonable machine that obeys a simple honest code of rules at all times and in any weather.' By directly relating the code of rules to the actual behaviour of the aircraft while in flight, 'he drove away the fear and the real danger that existed for those who were flying aeroplanes in the blackest ignorance even of first principles.' Instead of concentrating on dual instruction in the hours before solo and then letting the student virtually teach himself after he had soloed, Smith-Barry extended dual instruction well beyond this stage in order that the instructor might teach difficult manoeuvres and also catch bad flying faults before they became fatal.⁸⁴

Two developments assisted him. The first was the solution to the mystery of the spin. In the first years of the war to spin was almost inevitably to crash. Pilots who had recovered from spins did so by luck or by impromptu experiment, but were unable to explain why they had done so. E.C. Burton of Kenora, Ont., who received his pilot training in 1917 and later became an instructor, was given no aerial instruction whatever in recovery from spins. Instead, spinning was discussed at ground school, and in a fashion that demonstrated both the ignorance of the instructor and the danger to students. 'One lecturer stated,' Burton recalled, 'that not much was known about spins but it was best to keep out of a spin by avoiding a stall.' This officer hazarded the guess that 'If you get into a spin it might be best to keep your hands and feet off the controls and it would come out itself.'⁸⁵

At the time when student pilots in Canada were still being fed such nonsense, the terrors of the spin had been dispelled overseas. By late 1916 a number of pilots had discovered that by moving the stick forward and applying opposite rudder, recovery from the spin occurred. During the same period, experiments at the Royal Aircraft Factory at Farnborough had revealed the aerodynamics of the spin and consequently the measures required for recovery from it. Smith-Barry was thus able to incorporate deliberate spinning and recovery into his training curriculum.⁸⁶

The second development was the introduction of the Avro 504J. This two-seater biplane, fitted with a 100-hp Gnôme Monosoupape engine, was at first used as an advanced trainer. Smith-Barry saw that it was ideal for *ab initio* training. It was a reliable aircraft with the handling characteristics of a single-seater fighter and thus could be used to carry out all the aerobatics in his syllabus. So impressive were the results he obtained by using the 504J that the aircraft was selected as the standard trainer for the RFC.⁸⁷

In August 1917 Smith-Barry's training school became the School of Special Flying, with the task of training instructors according to his new principles. These instructors were then posted throughout the pilot training establishment in Britain to spread the gospel. Word of the 'Gosport System,' however, does not appear to have reached Canada until March 1918. It was then that Hoare complained to the War Office that he was not being sent vital information about new training methods. He had obtained a copy of Smith-Barry's pamphlet unofficially and thought the approach 'so admirable' that he was immediately introducing it to the RFC Canada training system.⁸⁸

This was done at Armour Heights, beginning in April. A special training course for instructors was instituted and the equivalent of an additional squadron of eighteen aircraft was formed to handle the programme. Soon Hoare was able to report that the new course was working smoothly; by the beginning of July ninety-five instructors had passed through it and been sent out to training squadrons. A second squadron had been added to Armour Heights and the new unit was re-formed as the School of Special Flying. By the end of the war the school had trained or retrained 257 instructors.^{*89}

* The only difference between the Canadian school and Smith-Barry's was, however, an important one: RAF Canada did not have the Avro 504. The JN4's limited performance and handling characteristics diminished the value of the advanced training that could be given on it. Moreover, since it could not be fitted with a rotary engine, pilots trained in Canada were totally lacking experience with an engine type widely used on first-line aircraft. Not only was familiarity required with the running characteristics of the engine, but also with the distinctive aerodynamic effects its rotary action imparted to the aircraft. Canadian cadets were therefore required to take additional training in Britain on service types of aircraft, a fact that put into question the heavy investment made in the Canadian training scheme. Almost from the beginning of the scheme Hoare pressed for a more advanced trainer to supplement the JN4, and saw no reason why such a machine could not be manufactured by Canadian Aeroplanes Ltd, provided suitable engines could be obtained from the United States. During the fall and winter of 1917-18 serious consideration was given to the manufacture of the Sopwith Pup in Canada as an advanced trainer. It was finally decided, however, that the Avro would become the Canadian 'all-through' trainer, and that CAL would produce it. A long delay ensued before CAL was given authority to begin production because of problems with engine supply from the United States. The Avro 504J was therefore modified to take other rotary types - the 110-hp Le Rhône and the 130-hp Clerget - in addition to the 100-hp Mono-Gnôme. The modified version was known as the Avro 504K. The engines for it were to be supplied from England. In July 1918 CAL was given a contract to produce five hundred 504Ks, the intention being to complete re-equipping RAF Canada by April 1919. A number of design changes by CAL, including a distinctive V-type landing gear, further delayed production. At the Armistice parts for about a hundred aircraft had been produced, but only two complete machines were manufactured before the end of the war. The contract was then cancelled. The 504K was the standard trainer of the Canadian Air Force and the RCAF until the late 1920s, but these aircraft were obtained from Britain after the end of the war, as the major part of the British aviation gift to Canada. See Minutes of the Air Board in Air 6; correspondence

For most of its existence, the Armour Heights school was commanded by Major Jack Leach of Toronto, one of the most colourful and popular figures in Canadian aviation history and a particularly fine pilot despite the loss of a leg while flying with 56 Squadron in France. Leach was an RMC graduate who had gone overseas with the First Contingent of the CEF and won an MC before transferring to aviation in 1916. He proved an able Canadian counterpart to Smith-Barry, applying the Gosport methods so effectively that not only were better pilots being produced, but a significant reduction in accidents and flying fatalities occurred.

Accidents had been the bane of the RFC Canada training scheme. As has already been noted, during elementary training accidents were accepted as routine. A cadet who trained at Camp Mohawk in the summer of 1917 wrote at the time that the afternoon he soloed 'there were about ten crashes and several machines were completely wiped out, but no one was hurt.' Another Camp Mohawk cadet recalled that 'there were lots of crashes but relatively few killed; I think there were three planes wrecked the first day we were there.' C.H. Andrews, who trained in the Deseronto Wing, noted in his diary on 21 October 1917 'the results of the day's work: 17 crashes, (three complete washouts) one killed, 5 in hospital. Very cheering.' At the Texas field in the winter of 1917-18 'the death rate was out of all proportion,' another recalled. 'There were no curbs on any type of flying; every good stunt ever heard of was attempted by anyone crazy enough to try it.'⁹⁰

It is true that flying discipline was extraordinarily lax compared with that enforced in more recent times. Students were encouraged to show 'dash,' and practices which would have brought 'washout' and worse during the Second World War earned no more than a reprimand in the First. Frank Ellis recorded one example from his days at Camp Borden:

One practice as far back as the summer of 1917 was for a pilot to wait in the air at the time the Toronto express for Barrie was due, and then to come in from behind at a fast clip, low down above the tracks. As he and his plane swept by over the length of the train, the crazy man at the plane's controls would deliberately bump his wheels on the roofs of several of the coaches before reaching the engine, when he would speed over the top and actually dip down in front of it along the tracks far enough in front to swing away and yet not have his identifying numbers on the rudder seen by passengers or train crew. It was supposed to be great fun along a particular section of the C.P.R. track between Baxter and a small town named Ivy, where the telegraph wires and poles were amply spaced to allow for such mad exploits.⁹¹

Such escapades undoubtedly contributed to the accident rate and to the toll of injuries and fatalities but the major cause, as Smith-Barry had argued, was insufficient training. J. Sterling Halstead, in assessing his period as a US Navy cadet in Canada during the summer and fall of 1917, had no doubts of the explanation: 'The principal reason for the large number of crashes was insufficient dual instruction. Whether this insufficiency was due to lack of instructors or a studied policy

of Hoare with the War Office and Air Ministry in Air 1/721/48/5; correspondence of General Brancker with the Air Ministry about American engine supply in Air 1/680/21/13/2205; and K.M. Molson, 'Aircraft Manufacturing in Canada during the First Great War,' *Canadian Aeronautical Journal*, v, Feb. 1959, 47-54.

based on the theory that it was more economical in the long run to have the poor material eliminated in this way early in the training course was hard to determine.⁹²

Statistics sent by RFC/RAF Canada headquarters to the War Office exist only for the period April 1917–May 1918:⁹³

ACCIDENTS AND FATALITIES BY SECTION,
APRIL 1917–MAY 1918

STATIONS	ACCIDENTS	FATALITIES
Fort Worth	74	30
Camp Borden	49	19
Deseronto	30	12
North Toronto	29	12
Beamsville	5	4
Long Branch	3	1

These figures are of limited value, since only those accidents resulting in injury or death were reported. They exclude accidents and casualties to non-RFC and RAF personnel. An analysis of the causes of aircraft accidents is available for the period August–November 1918. During that time there were 174 accidents (not necessarily linked to injury or death). Of these, 110 resulted from errors in judgment, thirty-nine from 'machine trouble,' eleven were assessed, mysteriously, as 'physical or mental,' and the remainder were put down as unavoidable.⁹⁴

Overall, RFC/RAF Canada lost 129 of its cadets in fatal flying accidents, one for every 1902 hours logged by the training scheme. That rate disguises the fact that RAF Canada's performance in this respect improved markedly in its last months. Moreover, statistics compiled for the whole of the RAF's training establishments, both in the British Isles and abroad, show that from January to October 1918 there were 1.34 fatalities per 1000 hours of flying, or about one every 750 hours. Though RFC/RAF Canada plainly had a better record than other RAF training formations, its fatality rate was exceedingly high compared with that of the British Commonwealth Air Training Plan in the Second World War.⁹⁵

HOURS FLOWN PER FATAL ACCIDENT,
RFC/RAF CANADA AND BCATP

RFC/RAF CANADA		BCATP	
April 1917	200	1940–1	11,156
May 1917	1000	1941–2	14,001
June 1917	1960	1942–3	17,725
December 1917	1500	1943–4	20,580
July 1918	1560	1944–5	22,388
August 1918	3300		
October 1918	5800		

There seems little doubt that the introduction of Gosport methods of flying training is the chief explanation for the sharp improvement shown by RAF Canada in

August 1918, a date that coincides well with the dispersal of Armour Heights-trained instructors through the system. And despite the improvement, it is evident that learning to fly in 1918 was still a risky business.

Accident rates, and flying training generally, were matters completely under the control of General Hoare and his staff, subject only to the approval of authorities in Britain. In 1918, however, two policy questions arose with which Hoare could not deal unilaterally, since both had to do with the peculiar position of the training organization, an arm of a British service, operating in Canada, a self-governing dominion. The first was the situation precipitated by the creation of the Royal Air Force on 1 April 1918. The British statute which established the RAF, the Air Force (Constitution) Act, provided that no one serving with the RNAS or the RFC could be transferred to the new service without consent. In Britain, those refusing consent were returned to their parent service, either the British Army or the Royal Navy. A period of three months, later extended to six, was allowed for members of the former flying services to exercise this option. In Canada the cutoff date was 10 October.⁹⁶

The problem confronting Hoare was not a threatened exodus of instructors or students; very few officers or cadets chose to leave the RAF. The crisis lay with the other ranks, the backbone of support for the training scheme. When, in July, Hoare protested to the Air Ministry that the extension of the option period from three to six months was 'going to have a paralyzing effect on us,' he did not exaggerate. Over 1600 RAF tradesmen, more than a quarter of those on strength, had applied for discharge and another 1000 were expected to follow suit. The tradesmen were not primarily, or even necessarily, signalling their antipathy to RAF service; rather, they were responding to the high wages to be earned in Canadian war industries. Most of those objecting to RAF service had been without skills at the time of enlistment. Now, having been taught trades, the men were seeking to take advantage of an unusual situation. Many of those wishing discharge were to be found in highly-skilled trades, such as engine mechanics and aeroplane riggers, which were vital to RAF Canada. More than half the other ranks at the Aeroplane Repair Park had asked for release and the proportion in several other units did not go below one in three. Hoare's initial reaction was that discipline was likely to suffer, because 'any man who received a minor punishment or is in any way disgruntled, can walk out as a protest and in most cases will not be liable to further service.'⁹⁷

The last point was the crux of the matter. RAF Canada had little leverage over its other ranks. Had Hoare been commanding a similar unit in Britain, his course of action would have been straightforward: those wishing release would have been paraded for immediate transfer to the Army or the Royal Navy, a sanction formidable enough to discourage all but those opposed root and branch to the formation of the Royal Air Force. But though Canadian tradesmen in the training organization were in fact liable to precisely the same treatment, common sense and ordinary political judgment (apart from other reasons) warned Hoare against the shipping of batches of recalcitrant Canadians overseas to serve in British units.

If the threat of immediate transfer to the British services was ruled out, then why not use the CEF for the same purpose? This was the line that Hoare decided

to take, but to make it stick he needed the co-operation of the Canadian government. He got it. With the collaboration of the Department of Militia and Defence and the Military Service Branch of the Department of Justice, Hoare arranged what might be termed a series of 'deterrent parades' throughout the summer and autumn of 1918. Groups of twenty men, all of whom had requested release, were paraded on the drill grounds of the Recruits' Depot, given their final pay and their discharge certificates, and then handed their call-up papers, previously obtained from the Ontario Registrar. They were then turned over to a waiting escort of Canadian military police who took them immediately to a CEF depot.⁹⁸

These draconian tactics served to encourage the withdrawal of a number of applications for discharge, whatever they may have done for morale. Unfortunately for RAF Canada, most of its men were in categories not liable for CEF duty. Many of them, through the co-operation of the militia department, had originally been recruited from the CEF because they were unfit for overseas service. Such men, it was determined, once having been released from the CEF for the purpose of enlistment in RAF Canada, could not legally be conscripted into the CEF upon discharge from the RAF. To stave off the loss of men in these categories, RAF Canada fought for time. Aside from the 'deterrent parades,' RAF Canada adopted the position that no releases would be granted during the option period and successfully obtained an extension of that period until 30 November. At the same time the Canadian government gave every assistance, through passage of a number of orders-in-council as well as orders and instructions from the militia and justice departments, all intended to plug loopholes and extend liability for CEF call-up. When, with a month to go before the expiration of the option period, the RAF appealed to General Gwatkin for legislation rendering *all* men wishing release liable for service with the CEF for the duration of the war, he was quick to oblige. A draft order-in-council was prepared stipulating that '...any man who, having been enlisted in Canada as a soldier of the Royal Flying Corps, has applied ... to annul his transfer to the Royal Air Force and whose transfer is annulled accordingly, shall immediately thereupon become liable to military service with the Canadian Expeditionary Force, and shall report to such unit of the Canadian Expeditionary Force as may be directed by the General Officer Commanding, Royal Air Force.'⁹⁹

This far-reaching order was justified by the militia department on two grounds: first, that its object was to deter men seeking release, not to recruit them for the CEF; second, that since the men involved had voluntarily undertaken military service with the RFC for the duration of the war, a commitment they now could void only because of the 'accident' of the reconstitution of the flying services, no injustice would be done to them by taking them into the CEF. This was an argument which some of those concerned might well have questioned. However, the armistice of 11 November made the order irrelevant and on 23 November the Air Ministry informed Ottawa that all men objecting to RAF service could now be released.¹⁰⁰ RAF Canada had managed to ride out its manpower crisis, but only the help of the Canadian authorities had enabled it to do so.

The training scheme's problems with its ground tradesmen gave rise to another policy consideration, this time originating with the Air Ministry in London. At a meeting of the Air Council on 18 July Major-General Sir Godfrey Paine, Master-

General of Personnel, suggested that the solution to RAF Canada's dilemma was for Canada to take over the training organization. 'This would release our own personnel and instructors,' he argued, 'and make the Canadian government responsible for their own establishment.' At a subsequent Air Ministry conference on 29 July, called primarily to discuss the formation of two all-Canadian squadrons, Paine raised the question again, this time with Major-General S.C. Mewburn, the Canadian Minister of Militia and Defence, in attendance. 'The matter had been brought to a head,' he said, 'by the attitude taken by a large number of the Air Force personnel (rank and file) now in Canada' who 'had refused to transfer to the R.A.F.' Paine went on to tell General Mewburn and his party that the Air Ministry was not satisfied with the output of the training scheme. Its graduates needed a good deal of additional instruction in Britain before being sent to squadrons (because, of course, RAF Canada had no advanced trainer). He alleged, indeed, that only six weeks were saved by training cadets in Canada. Instead, he proposed that Canada take over the training of all cadets recruited in the dominion, that an advanced training element be added, and that complete squadrons of trained pilots, ready for service at the front, be formed and sent to England. Any surplus of trained pilots could be absorbed by other squadrons after their arrival in England. Though he did not make this proposal with a view to the creation of a separate Canadian flying corps, Paine did not rule it out since that question was 'being discussed alongside.'¹⁰¹

That the Canadian government had some ultimate responsibility for the training plan and should answer for its deficiencies must have been news to Mewburn and his associates. The minutes of the conference state that 'the subject having been thus ventilated, the Canadians asked that they might have a memorandum in writing which they can place before their Prime Minister at once. They would like to consider it in the light of their naval defence requirements as well.' This was not the recollection of Major T. Gibson, Assistant Deputy Minister for the Overseas Military Forces of Canada, who was also present. He told his Deputy Minister on 2 October 1918 that after the proposal for a Canadian takeover had been discussed, 'Major-General Mewburn intimated to the Meeting that he could not see his way clear to advise the Government to accede to the proposal.'¹⁰² This seems very likely, not only because of the well-established reluctance of the Canadian Cabinet to make heavy commitments towards aviation, but also because Mewburn had been thoroughly briefed on the proposal by Gibson before the 29 July meeting. Gibson argued that there were two good reasons why Canada should not take over the training scheme. First, there was no connection between it and the proposed Canadian flying corps, since the Canadian Air Force was to be formed from RAF officers already overseas. Second, a Canadian takeover at that time would be an unsound and short-sighted investment:

While some criticism has been offered against the manner in which the Royal Air Force has carried on its work in Canada, the Government would not be justified in response to this criticism, in taking over the plant and activities of the Royal Air Force in Canada on account of the very large expense involved, which would be out of proportion to the benefits that

* The genesis of the Canadian Air Force is discussed in chapter 19.

would accrue. One of the strong reasons for the formation of the Canadian Air Force at this time is that Canada should have at the cessation of hostilities a flying corps trained in all branches of the air service including organization, administration and technical. It will be of advantage to Canada to acquire after the war such of the property of the Royal Air Force as may be needed for the administration and training of the post bellum Canadian Flying Corps. It will then be possible to take over at comparatively small cost such of the plant as Canada may require for the purpose indicated.¹⁰³

Whether Mewburn temporized at the 29 July meeting or not is of little consequence, since there was no likelihood, for the reasons advanced by Gibson, that the Canadian government would accede. The Canadian authorities were saved the necessity of formally rejecting the Paine plan when it encountered heavy weather within the Air Ministry itself. A senior finance official summed up his proposal as tantamount to saying that 'Our training establishments in Canada are not a success; let us therefore hand them over to the Canadian Government,' while Brigadier-General B.C.H. Drew stated flatly that the idea was 'really an impossible proposition.' He prevailed upon Paine to agree to a letter to the Canadian High Commissioner conceding that 'in view of the large financial adjustments necessitated by any such transfer, it would be inadvisable to proceed further with the proposal.'¹⁰⁴

The Canadian government thus retained its position of benevolent non-commitment towards RAF Canada. General Hoare appears to have taken little part in these proceedings, although he was at the Air Ministry in June and early July, and could hardly have escaped hearing some of the criticisms then circulating about his training scheme.* According to the recollections of Wing Commander D.L. Allen, Hoare then had other plans for the disposition of his Canadians: 'About April 1918, knowing the dreadful shortage of manpower in [the] U.K., we offered the newly-formed Air Ministry to supply the ground crews for five squadrons: ie, 150 N.C.O.'s [and] men per squadron, plus a first reinforcement to 50 per squadron, 1000 in all. We further undertook to keep these squadrons up to strength. We stipulated however, that the five squadrons so formed should be called "Canadian Squadrons" and be clearly identified as such. We did this as we were fully alive to the feelings throughout Canada that greater recognition should be given to the contribution she was making in air warfare.'¹⁰⁵ According to Allen, Hoare pushed this idea at the Air Ministry during his visit, but it was turned down because 'Canadian rates of pay and allowances could not be paid without causing trouble among the other airmen.'[†] Though no trace of this initiative has been located in

* That Hoare was sensitive to criticisms of RAF Canada was indicated by his request for the preparation of statistical data on the relative rates of progress of Canadian-trained pilots and those from other training brigades at advanced training units in Britain. Unfortunately, such statistics do not appear to have been compiled. Hearson to Hoare, 8 Nov. 1918, Air 1/721/48/5

† Allen also claimed to have taken the matter up with General Brancker in September, at the time of his return to England. 'He told me in confidence,' Allen stated, 'that his principal objection to forming Canadian Squadrons at that time was the fact that it was the Canada-trained pilots who were doing the bulk of the actual fighting in France in the R.A.F. squadrons. Suitable pilot material was in such short supply from U.K. sources that the squadrons just could not have carried on without the Canadian-trained element with their high morale and greater number of flying hours to their credit.' Allen to RCAF Historical Section, 22 July 1962, DHist 76/199

the documents surviving in the Public Record Office, it is a fact that by this stage of the war Hoare had become thoroughly committed to what in later years would be called 'Canadianization.'

While he was at the Air Ministry Hoare had proposed that graduates of the RAF Canada scheme be kept together while undergoing advanced training in England. On returning to Canada, he referred to the idea in a letter to the new Master-General of Personnel, Sefton Brancker. 'I think if Canadian pupils can be sent to certain definite Wings and grouped as much together as possible, preferably with officers who understand them, better results would accrue,' he wrote. No evidence exists to show that Canadians going through advanced training in England were encountering difficulties; it is more likely that Hoare's letter reflects both the increasingly nationalist tone of the Canadian press with respect to aviation and a number of complaints of discrimination by Canadians already flying with RAF service squadrons. At any rate, Hoare elaborated on his proposal in a second letter to Brancker. He suggested that one of the 'all-through' training wings in Britain should be allocated solely to graduates of RAF Canada. He could provide instructors for it from his School of Special Flying and augment them with additional staff from his organization, so that eventually the wing would become, except for groundcrew, entirely Canadian and 'practically a branch of the R.A.F. Canada.' Not only would the Canadian wing then have a strong *esprit de corps*, but its formation would find much favour in Canada. To round things off, he suggested that communications would be better on both sides of the Atlantic if the wing were commanded by one of his own officers. He therefore nominated his Inspector of Training, Major Arthur K. Tylee, for the job.*¹⁰⁶

This modest proposal won no converts at the Air Ministry. Brigadier-General J.G. Hearson, the Director of Training, told Hoare that although the total output of pilots from the Canadian scheme was satisfactory, the rate of supply fluctuated too much to permit the economic utilization of a wing solely for its graduates. Moreover, Hoare's essay at empire-building in reverse was 'most undesirable.' 'The whole object of the organization of the Royal Air Force is to prevent short-circuiting,' he informed Hoare. 'Your proposition would absolutely nullify this organization.' Short-circuitry, at which Hoare had proved so adept in Canada and the United States, could not be tolerated when it affected the structure of the RAF itself. Nevertheless, Hearson gave some encouragement. The Air Ministry had arranged that Canadians receiving advanced training in England would be sent to a selected number of Training Depot Stations and similar units, where they would comprise at least one-third of the students and be grouped in their own flights. A 'certain percentage' of the stations would be commanded by Canadians. In a separate letter Brancker expressed the hope that this policy 'will meet your request to some extent.' 'I am against putting Canadians and nothing else at the one Station,'

* Tylee, from Lennoxville, Que., had graduated from the Massachusetts Institute of Technology in 1907 and taken employment with an American heavy machinery company. Sent to open a company office in Montreal in 1913, he enlisted in the RFC in 1915, served overseas, and joined RFC Canada in 1917. After commanding a training squadron and then a wing, he was appointed Inspector of Training in 1918. After the war, he became the first commander of the Canadian Air Force, formed in Canada in 1920.

he continued, 'chiefly because they are a better type than we are getting in England now, and by distributing them throughout the country we gain by the good leaven they impart to the others.'¹⁰⁷

Hoare had to be content with this concession, which in any event came too close to war's end to have any noticeable results. That his espousal of Canadianization was genuine, and not motivated merely by stirrings in Canada, can be seen from the transformation which had taken place within the structure of RAF Canada itself. The ground trades, as already noted, were almost wholly Canadian, but at the outset of the training scheme the directing staff was nearly all British. Through the posting home of Canadian pilots and observers with operational experience, the secondment of officers from the CEF in Canada, the retention of graduate pilots as instructors, and the commissioning of technically qualified citizens, RAF Canada's directing staff had become at least two-thirds Canadian by the beginning of 1918. At the time of the Armistice, Canadians commanded two of the three wings and twelve of the sixteen training squadrons, as well as the School of Aerial Fighting and each of its four squadrons, the Cadet Wing, and the Mechanical Transport Section. About 70 per cent of all flying appointments were held by Canadians.* In the improbable event that the Canadian government had taken over the training organization, most of the men required to run it would have already been in place.¹⁰⁸

RAF Canada in 1918 was a much larger organization than had originally been projected, even though it now consisted of only sixteen numbered training squadrons and three wings, instead of the twenty squadrons and four wings planned.[†] It was the associated schools that made the difference: there were four squadrons at the School of Aerial Fighting (1 to 4 Aerial Fighting Squadrons), and two more at the School of Special Flying. Nor was it necessary in 1918 to employ the extraordinary methods of the previous year in order to find the recruits to keep the organization going.¹⁰⁹

The passage of the Military Service Act undoubtedly prompted many young men to choose the RAF rather than be conscripted for infantry service and the upturn in recruiting in the spring of 1918 may in part be attributed to this factor. In addition, the Chief of the General Staff, whose assistance to the training scheme had already been great, took steps to ensure that the RAF would not be starved for

* There were also some anomalies. For example, in February 1918 about one-third of the flying instructors on training squadrons were American.

† H.A. Jones, *The War in the Air: being the Story of the Part played in the Great War by the Royal Air Force*, v (London 1935), 467, notes that 'at the time of the Armistice the full organization of the Royal Air Force in Canada comprised, in addition to the three training wings, another of five squadrons in process of formation,' but this does not appear to have been the case. Much of Hoare's correspondence with the War Office and the Air Ministry throughout the course of the training scheme concerned the question of whether or not a fourth wing should be formed. Had the British Columbia plan been carried through, a fourth wing would have been placed there, but this idea was dropped at the time of the Texas agreement. When the manning picture brightened in late 1917 with the influx of American recruits, Hoare was told to form the five squadrons required to make up the new wing. No 93 Squadron was formed as the nucleus from which the others would emerge, but in the spring of 1918 this squadron was simply added to those already with the Camp Borden Wing.

recruits as a result of the act. Provision was made under the administration of the new act for the creation of a cadet reserve class, in which applicants between seventeen and three-quarters and nineteen years of age were enrolled. Cadets could be held on this reserve for six months. It served the double purpose of protecting RAF applications (under the act a man was required to register on reaching his nineteenth birthday) and providing a guaranteed supply of pilot trainees who could be fed into the training stream at desired intervals and rates. What amounted to a similar reserve of cadets and mechanics was also created within the CEF in Canada. Gwatkin urged commanding officers 'not to deter but to encourage men to volunteer for service in the R.F.C.' Depot Battalions were asked to publicize the existence of vacancies in the air service. Prospective cadets and mechanics were held for up to three months on the strength of the battalion and shown as 'not available for overseas draft.'¹¹⁰

In October 1917 Hoare had told Gwatkin that it was essential, were the training organization to continue to operate effectively, that 4500 cadets be obtained over the ensuing twelve months. At that time the intake was 350 cadets a month. The value of the help provided by Gwatkin, in addition to whatever inducement the Military Service Act produced, was demonstrated by the fact that from the end of 1917 to the Armistice 5900 cadets were recruited. At the end of May 1918 RAF Canada had 1200 cadets in the reserve class awaiting notice to report and a surplus of 800 cadets at various stages of ground instruction. Fourteen hundred cadets had been recruited during that one month alone. At that point it was thought wise to 'slow up to some extent.' Over the summer 457 pilot trainees who had finished their ground instruction were sent overseas for flight training because RAF Canada had more cadets than it could handle.*¹¹¹

On Armistice Day there were close to 12,000 men on the strength of RAF Canada, including some 600 officers, 4333 cadet pilots, 444 cadet observers, and 6158 other ranks. As well, nearly three hundred newly-commissioned second lieutenants were awaiting embarkation for overseas when the war ended, but by the end of the year the training organization had been almost completely dismantled. Demobilization began before the end of November, cadets with the least training being the first released. Hoare and British members of his staff departed for England, though RAF Canada continued as a skeleton organization until December 1919.¹¹²

* In 1918 RAF Canada flirted briefly with the notion of recruiting women. It already employed a substantial civilian female work force. Women not only held clerical jobs, but despite local criticism were also employed as transport drivers. In 1918 the manpower shortage drove RAF Headquarters in Toronto to advertise that a wide range of jobs were open to women. About 1200 were hired, and many were given technical training. Six hundred women were working as mechanics at airfields at the end of the war and another 135 were doing engine overhaul work at the repair parks. In May 1918 Hoare obtained the permission of both the Air Ministry and the Canadian government to recruit for a branch of the Women's Royal Air Force in Canada. The idea appears to have been dropped because upon investigation it was discovered that although the cost of barrack accommodation for men was about \$235 per capita, for women, because of 'the necessity of special provision,' the figure was \$430. See Sullivan, *Aviation in Canada*, 144-5, 283; Hoare to Air Ministry, 28 May 1918, Air 1/721/48/5; Governor General to Colonial Office, 1 Aug. 1918, PAC, RG 7 G22, vol. 9 (2).

The contribution of RAF Canada to the war in the air and to aviation in Canada was significant. Mention might first be made of some of its lesser achievements. One of these was in the field of aviation medicine, a branch of medicine in Canada which dates from the training scheme. The medical and dental staff of RAF Canada came from the Canadian Army Medical Corps and from the Canadian Army Dental Corps, through the co-operation of the militia department. These officers, nurses, orderlies, hospitals, and equipment were paid for by the British government. The medical staff was headed by Major Breffney O'Reilly, before the war a Toronto physician. He and members of his staff became increasingly interested in the physiological and psychological aspects of flying; their reports of their own work and of developments in Britain were the basis for further work in the postwar period.^{*113}

RAF Canada also made the first officially authorized airmail flight in Canada. On 24 June 1918 Captain Brian Peck flew a JN4 from the Polo Grounds in Montreal to Leaside, with stops near Kingston and at Deseronto, in less than seven hours, bearing a mailbag which he then delivered by car to the main Toronto post office. The *cachet* on the letters, authorized by the Deputy Postmaster General, bore the words 'Via Aerial Mail Montreal 23 6 18' (bad weather had forced Peck to delay his flight by a day), and surcharged, misleadingly, by the phrase 'Inaugural Service.' The affair was really a stunt concocted by the Montreal branch of the Aerial League of the British Empire, a body which had been active in publicizing the importance of aviation and in raising funds to donate aircraft to the RAF. Three more such flights between Toronto and Ottawa, again sanctioned by the postal authorities and this time under the auspices of the Aero Club of Canada, were carried out by RAF Canada in August 1918. The flights won some press attention, and served to demonstrate the feasibility of inter-city mail service, but they were not followed up.¹¹⁴

More important was the contribution of RAF Canada to the Canadian aircraft industry. Canadian Aeroplanes Ltd produced about 1200 JN4s for the Imperial Munitions Board. If the production of spares is added to this total, the overall output of the company was at least 2900 training aircraft. Of these, 680 were purchased by the American government for use at Fort Worth and in pilot training in 1918. It has been estimated that at least one in five American pilots trained during the First World War received instruction on Canadian-built JN4s.[†] Canadian Aeroplanes Ltd was far from being merely an assembly plant. Though the OX engines for the JN4 came from the United States and radiators, wheels, tires, and instruments were purchased from other firms, all other components, including pro-

* RAF Canada also developed the first Canadian flying ambulances. These were devised when it appeared that training might well continue throughout the winter of 1918-19 and some provision might be required for emergency evacuation of casualties from airfields when the roads were blocked with snow. On a number of JN4s the upper part of the fuselage was stripped away aft of the rear cockpit and replaced with an enlarged turtle deck hinged on one side and therefore capable of carrying a stretcher-borne patient.

† It should be mentioned, however, that when CAL production was just picking up in early 1917, and RFC Canada was desperate for aircraft, 150 JN4As were bought from the Curtiss plant at Buffalo, NY. Most of them were used at Deseronto. Hoare to Charlton, 25 April 1917, Air 1/721/48/5

pellers and even turnbuckles, were made within the plant. Almost all the materials used came from Canadian sources. To begin with, Irish linen was used to cover the wings, fuselage, and tail assembly of the JN4, but the successes of the German submarine campaign of 1917, as well as high demands from the British aircraft industry, cut down the amount of linen available to CAL. As a result, cotton produced in Quebec textile plants, after suitable doping, was used instead and proved both satisfactory and much cheaper.¹¹⁵

As well as the JN4, and the abortive work on the DH6 and Avro 504, Canadian Aeroplanes also produced flying boats for the Americans. The Felixstowe F5, a large two-engine patrol aircraft, was one of a series of F-boats developed by the RNAS, all their designs having been derived from the Curtiss H4 and H12 flying-boats. The US Navy placed large orders for F5s with a number of American plants, and an order for fifty was given to CAL. This was a large undertaking. The American version of the F5, the F5L, was fitted with 400-hp Liberty 12s instead of Rolls-Royce Eagles. These engines, as well as 'intercom' and wireless equipment, were shipped to Toronto from the United States for installation. The aircraft had an upper wingspan of more than 102 feet, was over 49 feet long, weighed 8250 lbs empty and about 13,000 lbs when fully loaded. It had mountings for as many as eleven Lewis guns and a position in the bow for a Davis quick-firing recoilless cannon.* Altogether the F5L was a much more advanced aircraft than the JN4, and a true test of the capabilities of Canadian aircraft manufacturing.

Canadian Aeroplanes Ltd shipped its first F5L to the Philadelphia Navy Yard at the end of July 1918, and it was successfully test flown the following month. By the Armistice the Toronto plant was producing eight boats a month. With the end of the war, the original order was cut back to thirty. The final F5L was delivered in January 1919. This was the last aircraft to go into production in Canada until 1923, when the aircraft department of Canadian Vickers got under way. Not until 1938, when Vickers began producing the Supermarine Stranraer, was a larger aircraft built in Canada.^{†116}

- * The Davis gun was essentially a tube, open at both ends, which was loaded through a slot in the centre. When it was fired a three-pound projectile was launched at the target through the muzzle and an equivalent weight of small shot took up the recoil energy in being ejected from the rear.
- † Aero engine manufacture had a less successful record in Canada during the First World War. The Imperial Munitions Board attempted unavailingly to interest the Wright-Simplex Co in making Hispano-Suiza engines in Canada for use both overseas and in the training scheme in 1916. Canadian Aeroplanes Ltd had the right to make Curtiss OX-5 engines, but found it more convenient to import them from Hammondsport. In early 1917 the IMB concluded an agreement with Willys-Overland to manufacture 240-hp Sunbeam Arab engines in its Toronto plant. The Arab was a v-8 engine with overhead camshafts, designed for lightness. The crankcase, cylinder heads, and engine block were aluminum (the block had hardened steel liners) and the overall weight was only 550 lbs. Unfortunately, while Willys was getting under way, testing of the engine in Britain disclosed cylinder and crankcase weaknesses. Numerous modifications and changes in specifications delayed the adoption of a final design until the end of 1917 and played havoc with the production schedule. Moreover, Willys' workmen were frequently unable to meet the precision machining demanded by the design. An inspector for the IMB reported in 1918 a pile of rejects 'about as high as the first floor of the plant.' By the end of the war only about 150 Arab engines had been shipped overseas from Toronto. All work then ceased. F.H. Hitchins, 'Aero Engine Manufacture,' Hitchins Papers, DHist, 75/514, file G5; C.W. Thomas, 'Sunbeam Arab: Canada's First Production Aero Engine,' *Aircraft*, March 1959, 47-8, 75

The JN4s produced by Canadian Aeroplanes for RAF Canada were to have a usefulness that outlived the training scheme. F.G. Ericson, formerly chief engineer of Canadian Aeroplanes, formed his own company (later Ericson Aircraft Ltd) and bought from the Imperial Munitions Board the whole of RAF Canada's aircraft inventory except for fifty JN4s given by the British government as a gift to Canada. Only ten of the latter were in fact retained; it was decided that the trainers were already obsolescent for military purposes and forty were turned back to the Imperial Munitions Board, winding up in the hands of Bishop-Barker Aeroplanes Ltd of Toronto. Both these and the aircraft acquired by Ericson were used in Canadian commercial aviation during the 1920s, whether for timber surveys in Labrador, for flying passengers and supplies to Northern Ontario gold strikes, or by barnstormers giving flying exhibitions. It was a JN4 that made the first flight over the Canadian Rockies.¹¹⁷

The contribution of RFC/RAF Canada to the war in the air was considerable. Of the 9200 cadets enlisted by the training organization, 3135 completed pilot training and over 2500 were sent overseas. Most of the others were either awaiting overseas posting or were serving as instructors in Canada before the end of the war. In addition, 137 observers were fully trained and eighty-five had been sent overseas. There seems little doubt that RAF Canada was just reaching its peak in late 1918. Despite the criticism Hoare had encountered in Britain, the output of the scheme compared favourably with an organization of similar size, the training brigade in Egypt.* The following table compares the pilot output of these two formations with that of training establishments in the British Isles from June 1917 to March 1918, the only period for which data is available:¹¹⁸

PILOTS GRADUATING

MONTH	BRITISH ISLES	EGYPT	CANADA	
			GRADUATING	SENT OVERSEAS
June 17	580	51	30	20
July 17	545	37	60	50
Aug. 17	456	59	95	50
Sep. 17	457	52	120	100
Oct. 17	634	39	80	78
Nov. 17	458	47	170	83
Dec. 17	434	49	240	180
Jan. 18	426	139	170	247
Feb. 18	588	79	210	160
March 18	892	136	245	230

Though RAF Canada's monthly average of pilot graduates was about 230 for the whole of 1918, output of pilots was climbing rapidly during the last months of the

* In the comparison period, the training establishment in Egypt attached to Middle East Brigade was larger than RFC Canada. As of January 1918, in addition to No 3 School of Military Aeronautics and a school of aerial gunnery, it contained six training wings and four additional training squadrons. DAO to RFC Records South Farnborough, 4 Jan. 1918, Air 1/1306/204/11/190

scheme. Had the war continued into 1919, RAF Canada would have met about a fifth of the estimated pilot and observer reinforcements needed for the Western and Italian fronts. A statistical summary and operational forecast prepared in the Air Ministry in November 1918 found that the average pilot casualties per month, during 1918, for all overseas operational units was 551, a wastage rate of 32 per cent a month.* Monthly casualties at operational stations in the British Isles averaged 287 pilots a month, for a total of 838. The average output of trained pilots from all training establishments during 1918 was 1200 a month. Given the planned expansion of the RAF for 1919, there was a narrow operating margin, made possible chiefly by the output of RAF Canada. From mid-1917 onwards a considerable and steadily increasing stream of badly needed pilots, the bulk of their training completed, had arrived at British ports and, after final training, had been sent to service squadrons. Their presence and that of the Americans also trained by RAF Canada was crucial to the winning of the air war.^{†119}

Much of the credit for the success of RAF Canada belongs to its commander, Brigadier-General C.G. Hoare. His resourcefulness and energy pulled the training scheme through its most precarious stages, his leadership produced an efficient organization and a remarkably loyal staff, and his tact won him the strong support of General Gwatkin and other Canadian authorities, without whose assistance the training scheme could hardly have functioned. Sterling qualities Hoare had in good measure. What is finally so impressive about him is the free-wheeling verve with which he brushed aside impediments insuperable to more orthodox men. International boundaries, national policies, and the hidebound ways of bureaucracies meant little to him; he ran over all of them wearing velvet boots. Certainly he deserves to be regarded as one of the fathers of Canadian aviation.

It is a testimony to Hoare's capabilities that his organization never found itself in trouble with Canadian politicians, and only rarely with the press. While Hoare was in Texas his staff in Toronto became involved in an injudicious attempt to muzzle press criticism of the number of fatal flying accidents occurring at the North Toronto airfields. When the chief press censor, Colonel E.J. Chambers, was drawn into the matter, he told a meeting of Toronto newspaper editors that some of their 'objectionable reports ... indicated a disposition to produce trouble for the Officers of the Flying Corps and ... appeared to have been written without a realization of the injury likely to be done to the service by the publication of statements reflecting upon the administration of the school.' He discovered, however, that the editors had a unanimously unfavourable view of the Royal Flying Corps; 'The Royal Flying Corps Officers do not seem to understand the position of the press on this side of the water and the relation which exists in Canada and the United States

* This summary estimated that the average number of operational hours flown per casualty (killed or missing) was 222.

† Because of the heavy recruitment of Americans in the early stages of the training plan, a high proportion, perhaps as much as one-third, of the pilots sent overseas came from the United States. The overall proportion of Americans in the total of cadets recruited by RAF Canada was of course much lower. Of the total of 7463 ground tradesmen enlisted by the RAF, more than 600 were recruited from the United States. RAF Canada HQ to Gwatkin, 30 April 1918, HQ 6978-2-62, vol. 3, PAC, RG 24, vol. 2031; Sullivan, *Aviation in Canada*, 146, 150

between newspaper men and Military Officers and officials generally. They appear to think that as they are Imperial Officers administering a Branch of the Imperial Service in Canada that their actions are entirely beyond criticism and beyond the reach of Canadian laws and Canadian institutions, this notwithstanding that the lives of young Canadians are in their charge. When these gentlemen are asked for news they seem to take pleasure in refusing it, and if any information is forthcoming it is supplied too late to possess any news value.¹²⁰ Gwatkin advised the RFC to temper its attitude towards the press. 'I strongly recommend you not to fight the Press,' he wrote, 'but to conciliate and make use of it; otherwise you will be set upon by masked men with poisoned weapons, and they will do you to death.' This sound advice was accepted. A 'discreet young officer,' Major Murton Seymour, was appointed to work with the press, and, with one exception, appears to have smoothed things over.¹²¹

The exception was the *Toronto Star*. RAF Canada had fallen foul of the press for understandable reasons. Its staff, or most of it, was accustomed to a more circumspect mode of journalism and in any event was inclined to be overly conscious of security. Such attitudes were bound to irritate newspapermen, and in the case of the *Star*, a paper with a decidedly nationalist outlook, triggered the closest approximation to a campaign against RAF Canada that was to occur during its existence. The *Star*'s hostility focussed first upon an incident in which a seventeen-year-old cadet, after being slightly injured in a training crash at Leaside, was recommended for discharge. Instead of receiving his discharge, the *Star* alleged that he had been ordered to serve as a mechanic. To the Toronto paper, this was arbitrary action against a 'boy volunteer' on the part of the RAF, 'or as it calls itself in Canada, the Imperial Royal Air Force, although why it should be only Royal in England and both Imperial and Royal out here in Canada we do not know, but would very much like to find out.'¹²² A subsequent editorial drew attention to the anomalous position of Canadians in the air service, and of the RAF in Canada:

... we have an Imperial Royal Air Force with branches all over this country, enrolling, enlisting, and training Canadian boys for war service under such conditions that they are outside the control of their own Government here at home, are not connected with the Canadian forces when they go abroad, and rely for pensions or any future provision their possible disabilities may require on authorities three thousand miles distant from the capital of their own country. It is curiously inconsistent with the part Canada is playing in the war, both at home and in the field, that both here and in the field there is flying over us an Imperial Royal Air Force and that we are manning a force not officered and administered by us.¹²³

In June 1918 the *Star* resumed its attack, the occasion this time being the refusal of the provincial Attorney-General to order an inquest into the death of a cadet at Camp Borden. 'The fact is,' an editorial claimed, 'that the coroner's inquest is the only hold that Canadian authority possesses on the operations of the R.A.F. in Canada.' Neither Parliament nor ministers of the crown could be appealed to for redress of grievance; instead, Canadians who had been injured by this British organization had recourse only to authorities in London, 'as in the days of their

grandfathers.¹²⁴ For the *Star*, there was only one solution: 'We should have our own Air Force in Canada, in England, and at the front. Particularly we should have no war-service recruiting and operating here independent of the supervision and control of the Government of Canada. To have such a service operating here is two generations behind the times, and it isn't working and it won't work. It is a plan that did not work in the governing of this country before Confederation.'¹²⁵ Though, as will be shown later, there were other voices calling for a separate Canadian air force, the *Star* was all but alone in its attacks upon RAF Canada. Indeed, except for occasional feature stories, the training organization attracted surprisingly little attention in the press, a condition with which its headquarters staff was quite content.

As a result, however, the training organization never received the credit it deserved for contributing to the air-mindedness so much a part of the Canadian outlook since the First World War. Two-thirds of the Canadians who served in the British air arms during the war joined through the training scheme; without it, thousands of them, especially the ground tradesmen, would have had no association with flying. Their exposure to aviation and their knowledge of it permeated the public consciousness in the interwar years and helped foster a climate sympathetic to the role of the aeroplane in Canadian development and communications. It is hardly too much to say that RFC/RAF Canada was the single most powerful influence in bringing the air age to Canada. Without it, both the RCAF and the civil air industry would have been much less solidly based and inevitably Canadian aviation would have been far more dependent upon American flyers and technicians, and upon American innovations. As it was, RFC/RAF Canada, and through it a number of Canadians, had made an impact upon the early history of United States aviation.

PART TWO
The Admiralty and the Air



The intrepid Commander Charles Rumney Samson about to start on one of his excursions over the Turkish lines of Gallipoli. (Q 13542)



Admiral Sir Charles Edmund Kingsmill was born at Guelph, Ont. In 1910 he became the first director of the Canadian Naval Service, playing a notable role in recruiting for the RNAS. (DND RCNO-776-2)



F/S/L R.F. Redpath of Montreal poses in front of a Voisin biplane at RNAS Station Eastchurch in early 1916. A comparison of this machine with a Handley Page V1500 or Sopwith Snipe (illustrated elsewhere) will demonstrate the great strides in aeronautical engineering made during the war. (RE 20959)



A group of Canadians at Felixstowe, 1916. Back row (l to r) F/S/Ls J.L. Gordon of St Lambert, Que., unidentified, F.S. McGill of Montreal, G.R. Halliday of Victoria, BC, and Robert Leckie of Toronto; front row, F/S/L George Hodgson of Montreal, B.D. Hobbs of Sault Ste Marie, Ont., and W.E. Robinson of Winnipeg. (PMR 74-508)



The German submarine U 14 was hit on the stern by an aerial bomb during the night of 1/2 Feb. 1915, while alongside the Zeebrugge mole – the first time in history that an aerial bomb inflicted serious structural damage on a warship. (Q 51410)



British naval airships on coast patrol (Q 18268)



A seaplane version of the Maurice Farman 'Shorthorn' piloted by F/S/L H.A. Peck of Montreal, taking off at Felixstowe, probably in 1915. (RE 19409-3)



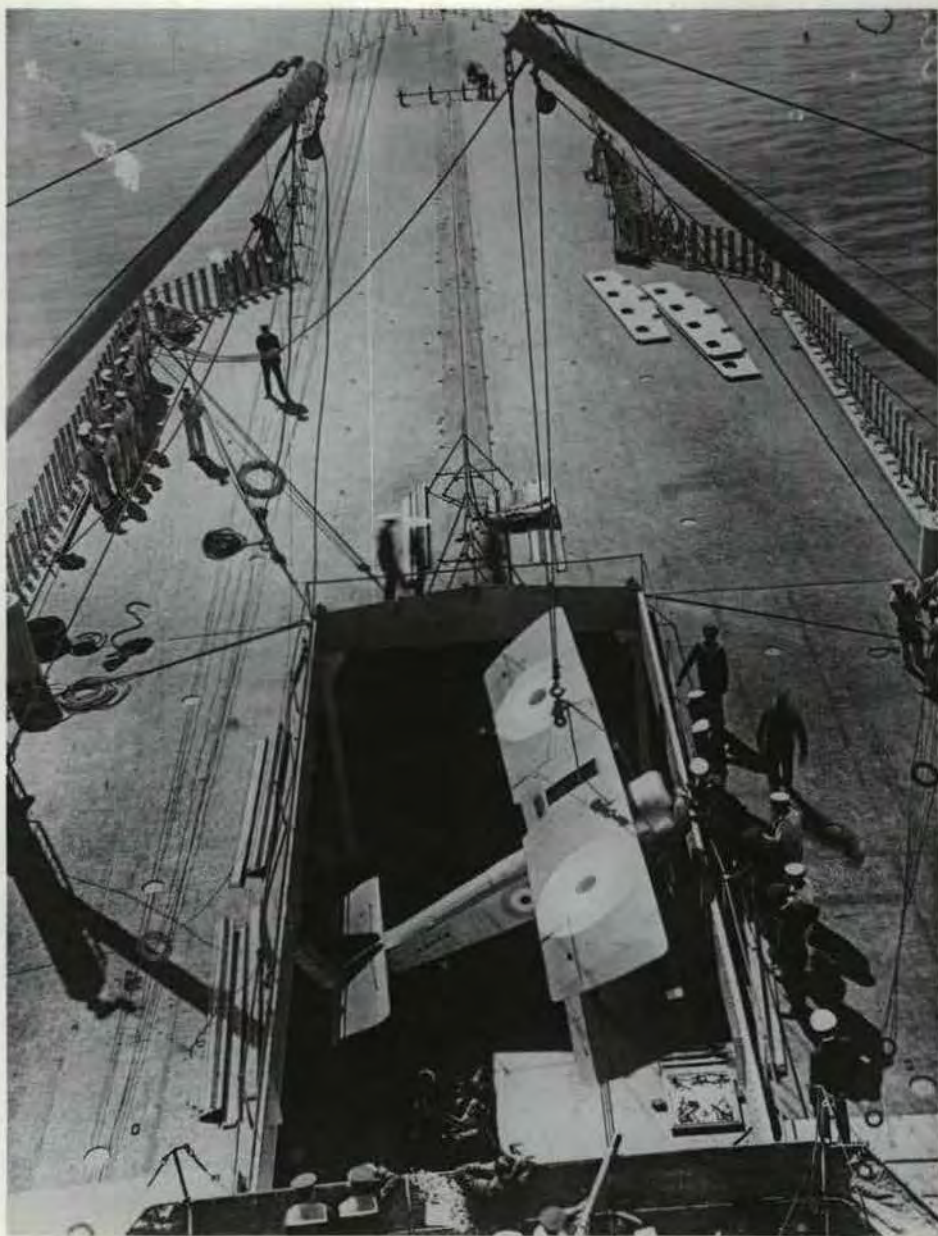
An early SS-type coastal airship returning to its base in the Aegean after a patrol over Gallipoli. The combined control car and engine gondola is simply the fuselage and power plant of a BE2c suspended beneath the gas bag. (Q 13498)



Canadians who joined the RNAS in Canada eventually found themselves at the Crystal Palace in London, undergoing basic ground training which included rifle drill. Visiting them, J.B. Brophy of Ottawa (then serving in the RFC) noted that 'The place was alive with Naval youths, whom I scorned ... A useless outfit. They sure have a nice place at the Crystal Palace, but it is not war.' (AH 456)



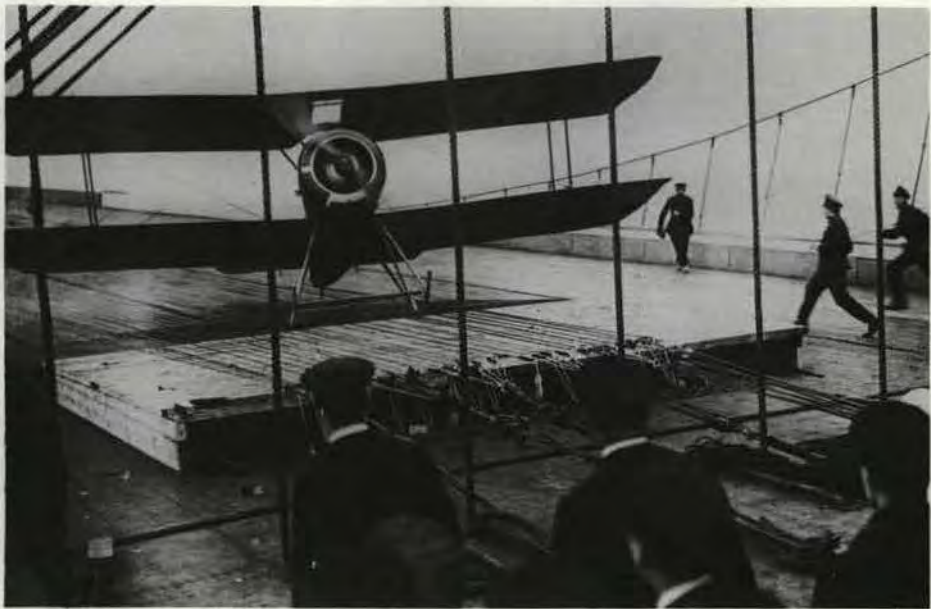
This reproduction of the painting by Charles Dixon shows F/S/L Robert Leckie of Toronto landing his H12 'Large America' flying-boat in the North Sea to pick up the crew of a downed DH4 on 5 Sept. 1917. With a damaged hull (from landing in the rough seas) and six men aboard, the H12 drifted for three days before being found by a minesweeper and towed to Yarmouth. (RE 17486)



Hoisting a Sopwith Pup from the hangar to the deck. A Pup became the first aeroplane to land successfully on the deck of a ship at sea aboard HMS *Furious* on 2 Aug. 1917. (Q 20638)



Sopwith Camels lined up on the 228-ft forward flight deck of HMS *Furious*. Originally a heavy cruiser, *Furious* was converted to an aircraft carrier by stages, a longer (280 ft) after flight deck being added later. (PA 6280)



A Sopwith Pup, with skids instead of the usual wheels, lands on HMS *Furious*. Note the longitudinal arrestor gear on the deck. (Q 20634)



2/Lt W.S. Lockhart of Moncton, NB, flying a Sopwith Camel off the forward turret ramp of the light cruiser, HMAS *Sydney*, 1918. Machines launched in this manner either had to land on shore or 'pancake' into the sea beside the mother ship. (PMR 71-872)



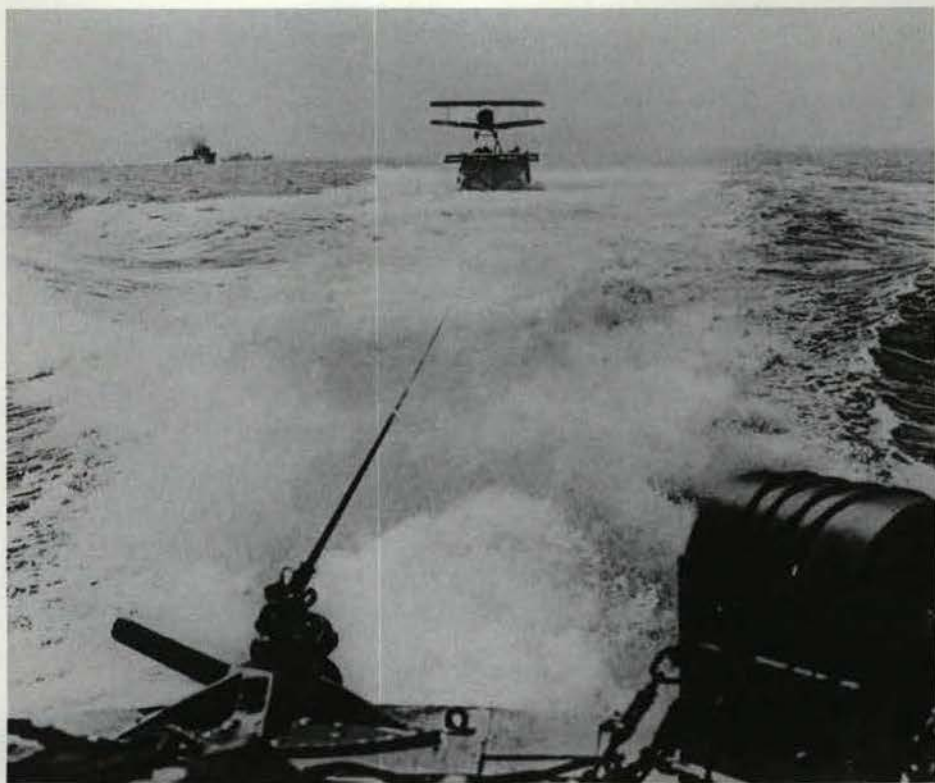
A Sopwith Camel aboard a lighter at Felixstowe. Towed into the wind at 30 knots by a destroyer, lighters like these provided an adequate take-off platform for the Camel. Landing, the aircraft either had to reach dry land or come down in the sea alongside the lighter. (Q 69367)



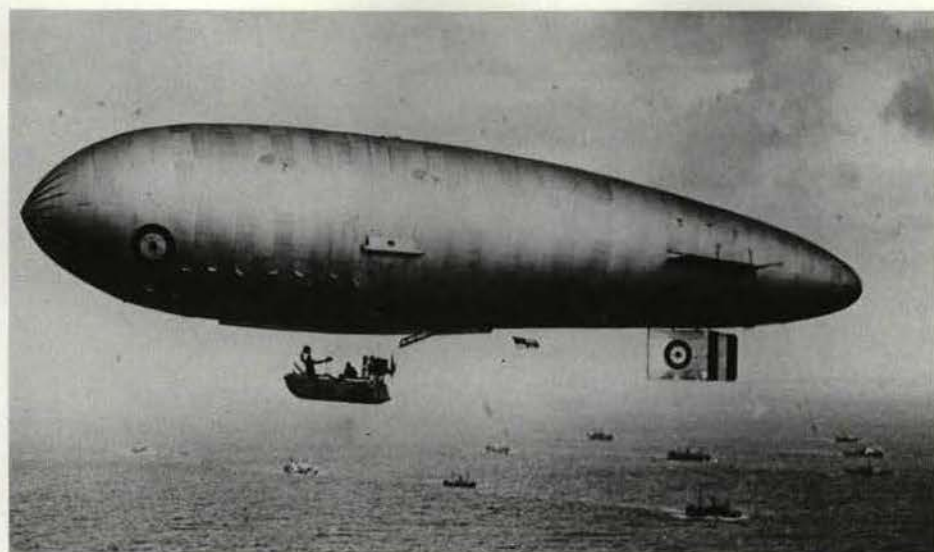
A lighter carrying a Sopwith Camel being towed at speed (HC 5066)



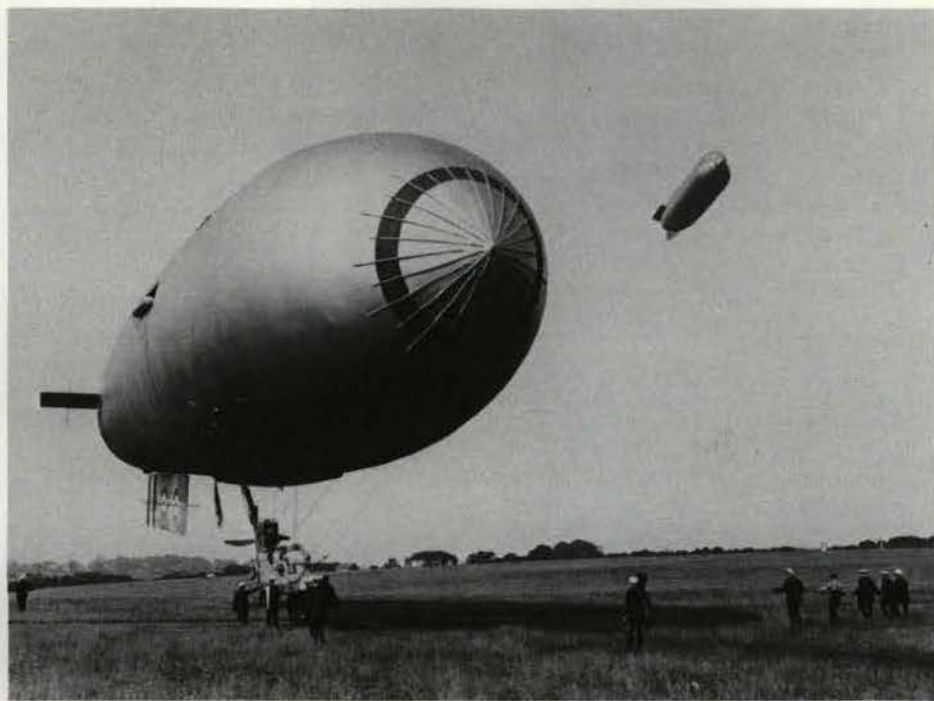
A Sopwith Cuckoo drops a practice torpedo, 1918 (RE 22020-1)



Lt S.D. Culley made the first successful take-off from a towed lighter on 31 July 1918. Less than two weeks after this picture was taken Culley shot down zeppelin L 53 over the North Sea, having taken off from a lighter. Born in the United States of a Canadian mother, Culley and his family had lived in Vancouver before the war. (AH 527)



An SS 'Z' non-rigid airship escorting a 1918 convoy. One of the crew is semaphoring a message to the airship carrying the cameraman. (Q 20643)



In the foreground an SS 'Z' airship ready to lift off on patrol. Behind it (and already in the air) a SS 'C': note the trefoil cross section of the latter. (Q 18263)