

Canadian Airmen and the First World War

S.F. WISE



Canadian Airmen and the First World War

S.F. WISE

The first of four projected volumes of the Official History of the Royal Canadian Air Force, this book provides the definitive story of Canadian airmen in World War I and, moreover, a revisionist account of the war in the air.

Organized topically, this volume begins with an overview of military aviation in Canada prior to 1914, as successful aircraft experiments like Baldwin's and McCurdy's *Silver Dart* are set against Defence Minister Sam Hughes' rejection of any government air policy. Financial timidity and political uncertainty subsequently decreed that the 20,000 Canadians who trained for, or fought in, history's first air war would have no air force of their own but would fly in the British flying services.

The sections which follow show that Canadians excelled in every aspect of the air war. Indeed, although the First World War never saw an exclusively Canadian squadron in action and no Canadian rose to a command above Group level, Professor Wise has been able to write a full account of the war in the air from the Canadian perspective. Recruitment and training, the maritime air war, the strategic bombing of Germany and the defence of Great Britain, as well as action on the Western Front, in Italy, and in Macedonia, are all covered in depth. Each section reveals the complexity of air operations, as tactics, strategy, and aircraft evolved with astonishing speed. The exploits of remarkable fighter aces such as Billy Bishop, Raymond Collishaw, D.R. MacLaren and W.G. Barker, and of bomber leaders like R.H. Mulock, are set in the context of the air war and the many thousands of Canadians who served with them.

In his conclusion Wise traces the development of Canadian government air policy to the year 1920, during which time the first Canadian air force was born and quickly died. In analysing this major step in Canada's entry into the air age he lays the foundation for postwar civil expansion and the formation of the RCAF.

Illustrated with specially prepared colour and sketch maps and over 200 photographs, many

Canadian Airmen and the First World War

WISE

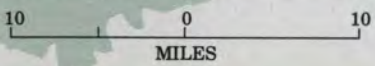
The Official History of the Royal Canadian Air Force Volume I

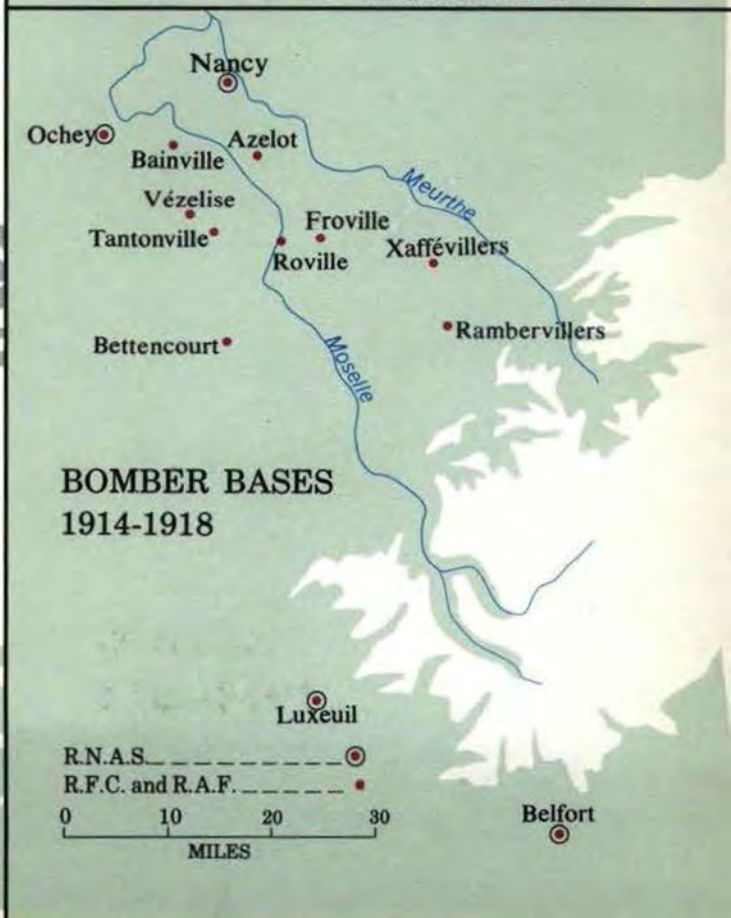
TORONTO



OPERATIONAL AERODROMES IN NORTHERN FRANCE AND BELGIUM 1914-1918

R.F.C. before October 1914 (Main map and Inset 'A') - - -
R.N.A.S. R.F.C. and R.A.F. 1914-1918 - - - - -
R.A.F. 11 November 1918 - - - - -





CANADIAN AIRMEN
AND THE FIRST WORLD WAR

THE OFFICIAL HISTORY OF
THE ROYAL CANADIAN AIR FORCE
VOLUME I

S.F. WISE

Canadian Airmen
and the First World War

The Official History of
the Royal Canadian Air Force
Volume I

Published by University of Toronto Press
in co-operation with the Department of National Defence and
the Canadian Government Publishing Centre,
Supply and Services Canada

© Minister of Supply and Services Canada 1980
Reprinted 1981
Printed in Canada
ISBN 0-8020-2379-7
Government catalogue number D2-63-1980

Canadian Cataloguing in Publication Data

Wise, Sydney F., 1924-

The official history of the Royal Canadian Air
Force

Contents: v.1. Canadian airmen and the first World
War.

Includes indexes.

ISBN 0-8020-2379-7

1. Canada. Royal Canadian Air Force - History.

I. Title.

UG635.C3W57

358.4'00971

C80-094480-1

Unless otherwise noted, illustrations in this book come from the Public Archives of Canada and the Imperial War Museum; acknowledgment is hereby given for permission to reproduce them.

Codes appearing at the end of captions represent negative numbers at the PAC.

Note: In the writing of this volume the author has been given full access to relevant official documents in possession of the Department of National Defence; but the inferences drawn and the opinions expressed are those of the author himself, and the department is in no way responsible for his reading or presentation of the facts as stated.

Contents

Preface	ix
Abbreviations	xvii

Introduction

1 Military Aviation before the First World War	3
--	---

Part I: Canadian Training and Air Policy

2 Recruiting and Training in Canada, 1914-16	23
3 Sir Sam Hughes, the Aviation Lobby, and Canadian Air Policy, 1914-16	46
4 RFC Expansion and the Canadian Air Training Organization	76

Part II: The Admiralty and the Air

5 Origins of Naval Airpower	126
6 1916: Diffusion and Misdirection	141
7 Alternative Roles, 1917-18	168
8 Aviation and the Victory over the Submarine	194

Part III: Strategic Airpower

9 The Air Defence of Britain	234
10 The RNAS and the Birth of a Bombing Strategy	260
11 The Strategic Air Offensive against Germany	284

Part IV: Airpower in the Land Battle

12 Experiments on the Western Front, 1914-15	334
13 The Birth of Airpower, 1916	358
14 Stalemate on the Western Front, 1917	393
15 Italy and Macedonia, 1917-18	449
16 The Ludendorff Offensives, 1918	479

17 Amiens	518
18 Perfecting the Air Weapon	542

Conclusion

19 Towards the Establishment of a Canadian Air Force	579
--	-----

Appendices

A Canadian Airmen and the British Intervention in Russia, 1918-20	623
B Canadians in Other Theatres, 1915-18	629
C Statistical Analysis of Canadians in the British Flying Services	633

Notes	651
-------	-----

Index	727
-------	-----

Maps and Illustrations

colour maps

- 1 The Royal Naval Air Service: chart showing air stations and the anti-submarine measures employed in home waters during 1917 *between* 172-3
- 2 The air offensive against Great Britain, February 1915-May 1918 238-9
- 3 The Battle of the Somme: the air plan in support of the Fourth Army offensive, 1 July 1916 364-5
- 4 The air concentration for the Ludendorff offensive, 21 March 1918 484-5
- 5 The Battle of Amiens, 8-11 August 1918 522-3
- 6 The Royal Air Force in the final offensive, showing the disposition of RAF brigades with the armies, 8 August and 11 November 1918 550-1

sketch maps

- 1 The North Sea, August 1914-December 1915 129
- 2 Gallipoli: Royal Naval Air Service units at the Dardanelles, August 1915 136
- 3 The Strait of Dover and Flanders Coast, 1917 146
- 4 Anti-submarine patrol (spider web) 183
- 5 Zeebrugge defences, July 1918 204
- 6 Ostend defences, July 1918 206
- 7 Areas of operation 3 (Naval) Wing, 30 July 1916-14 April 1917 265
- 8 Bombing targets of 41 Wing, VIII BDE and Independent Forces, RAF, October 1917-November 1918 288
- 9 Searching for the British Army: aerial reconnaissance tasks ordered by German First Army headquarters, 22 August 1914 336
- 10 Royal Flying Corps: air reports for 22 August 1914 337
- 11 Eve of the Somme: dispositions of the opposing air forces, 30 June 1916, BEF front 367
- 12 The Somme: plot of information passed by aircraft working for XIII Corps, 1 July 1916 370
- 13 BEF operations, 1917 399
- 14 Battle of Arras, 9 April 1917 403

- 15 The wedge: situation of III and V RFC brigades, 21–25 March 1918 489
- 16 The prelude to victory, August–November 1918 544
- 17 Battle of Albert: operations by 8 and 73 Squadrons RAF in close support of tanks, 21 August 1918 546
- 18 The battles south of the Scarpe, 21 August–26 September 1918 556

illustrations

Black and white photographs are placed following pages 1, 19, 121, 229, 329, 577, 621.

Preface

This book, the first in a series of four planned volumes on the history of the Royal Canadian Air Force, has been a long time in the making. It is about what might be called the pre-history of the RCAF, for it is mainly concerned with a part of our aviation experience which is still almost unknown to Canadians: the First World War. The idea that such a book ought to be written, at least so far as the record shows, first belonged to an administrative officer with the Canadian War Records Office. Captain J.N. MacAdams had the job of collecting and organizing the service records of Canadians who had flown with the Royal Air Force and its predecessors during the First World War. He was surprised and impressed by what these records disclosed, and recommended to his superiors in the headquarters of the Overseas Military Forces of Canada that an official history of what Canadians had done in the air should be written.

Nothing came of his suggestion. The very notion of official military history was unfamiliar to Canadians, since they had had little previous requirement for the product. Moreover, if official history was to be written, the Canadian Expeditionary Force was the obvious subject. By far the largest military formation Canada had ever put into the field, it had been commanded in its final years by a Canadian. Its numbered battalions, anonymous though they might at first appear, had in fact been based upon a regional militia system with roots deep in the country's past. The travails of the CEF had brought anguish to tens of thousands of homes; the support it required had strained the political system to an unparalleled degree. Its spectacular victories, and the visible part it had taken in the final victory, had aroused deep and rightful national pride, and won for Canada a place in the councils of the empire, the treaty settlements, and the League of Nations that otherwise she would not have enjoyed. Unquestionably the CEF merited whatever resources the government of the day was disposed to devote to official military history. As for Canadian airmen, it was perhaps believed that their part in the war could safely be left to the historians of the British services for which they had flown. If that was in fact the view, it was a regrettable, if understandable, error.

The British official history, *The War in the Air*, was published in six volumes between 1922 and 1937. It is a landmark of aviation history and has been an indispensable guide in the preparation of this book. Since it was written perspectives have changed and much new information has become available. Many of its

judgments can now be challenged, as from time to time they are in this volume; many passages are polemical in nature, strongly favouring the Trenchardian view of strategic air power. From a Canadian perspective there is another deficiency in *War in the Air* of which its authors, Sir Walter Raleigh and H.A. Jones, were probably quite unconscious. British air forces of the First World War – the Royal Naval Air Service, the Royal Flying Corps, and the Royal Air Force – were multinational in composition, drawn mainly from the British Isles but also, and to a substantial extent, from many parts of what was then the British Empire. Raleigh and Jones may have assumed, with Sir David Henderson, a wartime commander of the RFC, that 'the more people of British origin are mixed up together in this war the better'; at any rate, little attention is given in *War in the Air* to the contributions made by airmen from the colonies. In 1934 the Australians corrected this oversight, so far as their own airmen were concerned, with the publication of F.M. Cutlack's *The Australian Flying Corps in the Western and Eastern Theatres of War, 1914-1918*. There is recorded, in meticulous detail, the work of the four Australian squadrons and other units which operated under British control. As it happens, many more Canadians than Australians served as airmen during the war, but until its last days there were no formations that had a specifically Canadian identity. In the indexes to *War in the Air* there are six references to Canada. Though Canadians are mentioned by name in the text, their national origin usually is not. Yet Air Ministry records show that by 1918 the Canadians had become a vital component of the fighting strength of the RAF, just as the RAF itself had become an essential element in the war on land and at sea.

If there was little the Canadian public could learn of the part their airmen had played during the First World War from the British official history, they were no better served by their own authors. One excellent book about the RAF training organization, *Aviation in Canada, 1917-1918*, by Alan Sullivan, was published at the end of the war. It was not written in a form that would capture public attention, however, and even the fact that a large-scale air training scheme was in operation in Canada during the last years of the war has passed from public memory. Most material published about the Canadian air effort between the wars was of an ephemeral character, and almost all of it was about a handful of remarkable fighter pilots. That many thousands of Canadians flew operationally during the First World War; that their services were not confined to the fighter role but embraced the entire range of aerial activities; and that they were present in every theatre, from Archangel to East Africa, and not solely on the Western Front – none of these facts ever got home to Canadians at large.

An impression was created that Canadian involvement in the air war could be summed up in the exploits of a small number of 'aces,' an impression cemented by George Drew's popular *Canada's Fighting Airmen* (1930). It was a notion that carried over to the Second World War, and distorted the reality of Canada's air effort in that struggle quite as much as it had for the First World War.

Survival, not history, was a chief preoccupation of the Royal Canadian Air Force between the wars. Not until January 1940 was Flight Lieutenant Kenneth B. Conn, then employed in the Directorate of Staff Duties, given the additional task of collecting historical records. By the end of the war he was the Air Historian

(since 1944) in the rank of Group Captain with a staff that included thirty-two officers. His establishment published the first two volumes of *The RCAF Overseas*, a popular account of operations prepared while the war was still on. In addition, the Air Historian envisaged a complete official history of the RCAF in nine volumes, to be written and published after the end of hostilities.

After the war, however, the historical establishment was cut to two members, Wing Commander Fred H. Hitchins (Group Captain Conn's successor) and a secretary. The third volume of *The RCAF Overseas* was published, but the ambitious project for an official history was cancelled. The postwar Air Historical Section was, therefore, unable to do much more than maintain the records already held, add to them the current unit historical reports, carry out a limited amount of research on early aviation history, and publish a few small contributions to RCAF history, notably *The RCAF Logbook*, a chronology that appeared in 1949. In 1960 Hitchins was succeeded by Wing Commander Ralph V. Manning, who retired in 1965 when the historical establishments of the three services were merged as the result of integration.

Colonel C.P. Stacey, first director of the unified historical establishment of the three services, quickly obtained authority for an official history of the Royal Canadian Air Force much reduced in scale from that Group Captain Conn had planned. After I had succeeded Colonel Stacey and had begun detailed planning for the series in conjunction with Lieutenant-Colonel D.J. Goodspeed, then Senior Historian in the Directorate of History, we decided that the First World War phase of the history should be treated in a separate volume.

We took that decision for three reasons. Preliminary work already done by the former Air Historical Section and continued by historians in the Directorate of History had demonstrated that the Canadian part in the air history of the First World War was of significant dimensions. Second, it was apparent that much of the Canadian story was utterly unfamiliar, since Canadian activities, so far as the public was concerned, had been telescoped into the activities of a dozen or so fighter pilots. Finally, it was evident that the First World War aviation experience, in all its complexity, was basic to the later history of the RCAF. Nearly all the senior officers of the RCAF between 1924 and 1945 had been directly involved in the First World War; every aspect of modern military aviation had its origins in the 1914-18 period; and so had the beginnings of Canadian air policy. Moreover, an understanding of the relationship of the RCAF to other services, and to the RAF, must derive partly from an understanding of the way in which the air arm evolved during the First World War.

Canadians in large numbers, substantially more than 20,000 of them, were present at the creation of military air power in this century.* An account of their

* Air history deals in a scale of numbers much different from army history, partly because of the large ground organization necessary to maintain a relatively small number in the air. The fighting component of an RAF squadron in 1918 was thirty men or less, a figure that may be compared to the one thousand all ranks that constituted the fighting strength of a Canadian infantry battalion of the same period. It is worth noting, however, that at the end of the war there were 188 operational squadrons, plus fifteen independent flights (the equivalent of another five squadrons), in the RAF, and that the total strength, ground and air, of that service was about 300,000.

service experience poses a problem not customarily faced by official historians, although it is one that recurs with respect to many members of the RCAF during the Second World War. Ordinarily, official histories have as their subject the armed forces of Canada, whether the Canadian Expeditionary Force of the First World War or the Canadian Army and the Royal Canadian Navy during the Second. In the present case, however, our subject is the work of many individual Canadians in three British services; in other words, this is essentially a study of the colonial phase of the history of Canadian military aviation. Not until late in the First World War were distinctive Canadian air units formed: the Canadian Air Force and the Royal Canadian Naval Air Service. Until these small organizations were created, Canadians were scattered unevenly through the many units of the RAF and its precursors.

This volume is not simply a collective biography of the thousands of Canadians who fought in the air, or aspired to do so, but is primarily an attempt to restore a phase of our military history – and, indeed, of our national history – that has been all but lost. The aim has been to keep the Canadians to the fore, but at the same time to ground their work in the many contexts that give pattern and meaning to what they were doing. Thus the manner in which Canadians entered the flying services and underwent flying training has been set within the context of the general state of aviation in the country, the shift of public and governmental attitudes towards aviation and the gradual evolution of a Canadian air policy. In theatres of war Canadians, with a few exceptions, did not rise to important command positions. At one level, therefore, much of this history is about the operational tasks of pilots and observers. These operations, however, make little sense by themselves, and it has been necessary to connect them to the evolution of aircraft, weapons, and tactics, to the operations of land and sea forces, and to the policies and organization of the British flying services. So well represented were the Canadians in every aspect of military and naval air operations, especially after 1915, that it has been possible to recount every important stage in the air war by drawing upon the experiences of individual Canadians.

To reconstruct the 1914–18 air war from a Canadian perspective has been a research task of some complexity. The starting point was the thousands of record cards compiled by Captain MacAdams and his clerks in 1919 from records of the RAF and the headquarters of the Overseas Military Forces of Canada in London. On each card was written the name of the airman, his rank, trade, decorations, place of origin in Canada (or place of enlistment), record of service, and, occasionally, occupation prior to enlistment. This invaluable record was brought home to Canada, and for many years found a resting place in the Army Historical Section in Ottawa. The vicissitudes of time, the irrelevance of the card file to the work of the Section, and even the domestic habits of its members (if one is to judge from the coffee rings on some of the cards) resulted in many losses, particularly from the latter part of the alphabet.

Eventually the file was taken over by the Air Historical Section and became a particular concern of Fred Hitchins. Dr Hitchins' scholarly interest in First World War aviation long predated his RCAF service, and it was singularly fortunate that he was given the task of investigating the work of Canadians in the RFC, RNAS,

and RAF. He successfully argued that 'a purely statistical account of Canada's aerial contribution in 1914-1918 would be comparable to a pie crust without any filling,' and in 1941-2, therefore, he spent a good part of his time, while working at the National Library of Wales, Aberystwyth, where RAF records were then held, in accumulating notes and documents having to do with First World War aviation. From the point of view of the present history, Dr Hitchins' work had two important consequences. In the first place, he was able to begin the reconstitution of the card file, to add new names to it (MacAdams never claimed to have produced a complete inventory of Canadians), and to annotate many of the cards. Secondly, many of the rough notes and narratives he compiled were based upon documents that no longer exist, since unfortunately a number of RAF files referring to Canada were destroyed before or during the transfer of RAF records to the Public Record Office in London.

Gradually, as the result of Hitchins' work, later carried on by the Directorate of History, there was accumulated a large body of documentation of the most varied kind: logbooks, diaries, letters, photographs, and taped interviews with former airmen. Most of this collection was organized into biographical files, and included papers of such notable airmen as W.A. Bishop, Ray Collishaw, W.G. Barker, Lloyd Breadner, and R.H. Mulock.

The next stage in the research process was to link this mass of biographical evidence with the totality of the record of First World War aviation. At the Public Archives of Canada there were both governmental and private collections having to do with the formation of Canadian aviation policy, the recruiting and training of airmen in Canada, and the establishment of a Canadian aircraft manufacturing industry. The major sources for this volume, however, were in the Public Record Office in London, and comprised not only the massive collection of RAF records grouped under the Air Series but also supporting materials from Admiralty, War Office, Colonial Office, and Cabinet records.

It was a relatively straightforward task to examine these various collections for important evidence dealing with air policy, organization, and the general development of the air war in relation to other services and the many theatres in which aviation played a significant part. It was much more difficult to extract from them evidence which bore on the actual work that the Canadians were doing in the air, if only because the Canadians were rarely identified.

In order to approach the British records effectively, a volume listing every RNAS, RFC, and RAF unit was prepared. Under each unit heading were listed alphabetically the names of every Canadian known to have served with the unit, together with the dates of service whenever that was known. This listing, rather cumbersome to use though kept in loose leaf form (and constantly updated, since new information kept turning up), became the key to the war diaries, record books, bombing and combat reports which constitute the basic operational records of the British flying services in the First World War. With this guide in hand, it was then possible to identify units in which, from time to time, sizeable numbers of Canadians served. Few unit records were copied in their entirety for any given period, but in all cases sufficient copying was done to ensure that the work of the whole unit, and not just of the Canadians in it, became clear in order to maintain a

proper balance between the contribution of the Canadians and that of the unit as a whole. All the records collected in this way were indexed and organized to make them accessible for research and to link them to the biographical collection. In sum, the body of evidence ordinarily immediately available for the writing of Canadian service history had first to be generated before a history could actually be written. Only the reader can judge whether the result justifies the effort expended.

Since this book is about Canadians rather than a Canadian service, a working definition of 'Canadian' was a necessity. The term 'Canadian National' had no legal status until legislation of 1921 and prior to that date persons living in Canada and exercising the rights of citizenship were, in law, British subjects, whether native-born or naturalized. Before 1914 people in Canada knew very well what a 'Canadian' was, but their definitions were apt to vary remarkably according to region and ethnic origin.

There was a further complication. The decade prior to the outbreak of war was one of heavy immigration to Canada, a movement that included many thousands of young men from the British Isles. For rather a longer period, there had been a significant emigration of native-born Canadians to the United States. From both groups came many members of the British flying services, recruited either in Canada or through the agency of the Royal Flying Corps in the United States. We have deemed immigrants from the British Isles to be 'Canadian' if they had been resident in Canada for some length of time before the war, could be shown to have established genuine roots in the country, or, above all, if they returned to Canada after the completion of their flying service.* For those resident in the United States who were born in Canada or, through parental or other ties, had some close association with Canada, judgment was made on a case-by-case basis. It is likely that in both these categories were many who, in their own minds, were Canadian but who have been overlooked simply because evidence does not exist to justify their inclusion. The reverse situation also holds: many native-born Canadians joined the RAF or emigrated to the United States after completing their war service. Such persons were undoubtedly Canadian at the time they performed war service. Despite much care, it is probable that a number of individuals have been identified as Canadian who were, at most, mid-Atlantic in affiliation. Nor will the actual number of native-born Canadians who flew during the war ever be known because of the absence of documentation.

Their numbers were indeterminate and the precise status of some of them was unclear, but from their first appearance the Canadians were recognized as a distinctive element in the flying services by those who led them or flew with them. Most of the Canadians who were first on the scene favoured a service in which particular national identities were subordinated to an imperial whole; most of those who came after them were entirely satisfied to be merged with others in a British ser-

* Under the Immigration Act of 1910 any person born in Canada (who had not become an alien) or any British subject domiciled for three years in Canada (provided that he had not since left Canada for a period of one year or more) was categorized as a Canadian citizen. This definition was the basis of the Canadian Nationals Act of 1921.

vice. A substantial proportion of their RCAF successors who served with RAF units during the Second World War felt the same way.

Yet as their numbers rose, especially after the beginning of 1917, the Canadians began to develop a consciousness of themselves as a distinct group within the air services. Many of them had transferred to flying duties from the Canadian Expeditionary Force, were undoubtedly nationally-minded, and were confident of the Canadian capacity to sustain an effective military organization. While valuing their comradeship with airmen from the rest of the empire, they were increasingly sympathetic to the idea of a separate Canadian air force. One of these was W.A. Bishop. As a young pilot officer I passed under the cold blue reviewing eye of Air Vice-Marshal Bishop, VC, DSO, MC, DFC, Croix de Guerre, an experience shared with many thousands of graduates of the British Commonwealth Air Training Plan. His presence was a visible demonstration to us that our service, young as it was, had a tradition of high accomplishment.

Those of us who have worked on this history had as our aim the establishment of a foundation for the later history of the RCAF. In assessing the part taken by Canadians we endeavoured to give them their due and, we trust, no more than that. The qualification is necessary because we came to admire greatly this remarkable company. We met some of them, and corresponded with others. I wish to thank them, and the families of other Canadian airmen, for all the advice and assistance patiently and generously given.

When this history was begun, the Directorate of History was made up of former members, military and civilian, of the three historical establishments of the armed services. Other historians joined them in subsequent years. Aviation history was strange and even forbidding territory to all but a few of them. The process of conversion is always difficult, but it was eased by the sense of teamwork which developed among us, a sense that to a great degree came from a mutual conviction of the importance of what we were doing. I must take responsibility for all that follows, but I must say as well that this book is the result of a collective effort sustained over several years, the product of much discussion, heated debate, and mutual criticism and instruction. To the present director, Dr W.A.B. Douglas, and to all members of the Directorate, past and present and too numerous to list, I wish to express my thanks, both for their work and for the experience of having worked with them. They, and the secretaries and typists who coped with early drafts, will understand the particular thanks I wish to extend to Gloria McKeigan and Elsie Roberts for their calm efficiency at all stages of the manuscript.

A number of institutions have helped greatly in the preparation of this history. I wish to thank the Dominion Archivist and the staff of the Public Archives of Canada, the Keeper of the Records and many kind officials of the Public Record Office, London, the Director and staff of the Imperial War Museum, the Curators and staffs of the Canadian War Museum and the Aviation and Space Division of the National Museum of Science and Technology, the staff of the National Aeronautical Collection, the Archivist of the University of Toronto, and the Superintendent and staff of the Alexander Graham Bell National Historic Park at Baddeck, NS. The advice of the Operational Research and Analysis Establish-

ment's Director of Mathematics and Statistics, Dr Marcus Weinberger, was invaluable in preparing Appendix C. My thanks are also due to the many individual researchers in the field of Canadian aviation history who have contributed their expertise.

S.F. WISE

Institute of Canadian Studies
Carleton University

Abbreviations

2/Lt Second Lieutenant

AA anti-aircraft

a/c aircraft

AEG *Allgemeine Elektrizitäts Gesellschaft*

AFC Australian Flying Corps

AFC Air Force Cross

AG Adjutant-General

AGO *Aerowerke Gustav Otto*

AGS School of Aerial Gunnery

Air Air Ministry records in the Public Record Office, London

app. appendix

A/S anti-submarine

BASF *Badische Aniline und Soda Fabrik*

BCATP British Commonwealth Air Training Plan

BEF British Expeditionary Force

BHP Beardmore-Halford-Pullinger

BI Baby Incendiary [Bomb]

Cab Cabinet Office records in the Public Record Office, London

CAF Canadian Air Force

CAL Canadian Aeroplanes Ltd

CAS Chief of the Air Staff

CB Confined to barracks

CEF Canadian Expeditionary Force

CFS Central Flying School

CGS Chief of the General Staff

CIB Wireless Central Information Bureau

CIGS Chief of the Imperial General Staff

C-in-C Commander-in-Chief

CMB coastal motor boat

CMR Canadian Mounted Rifles

CO Commanding Officer

CTS Canadian Training Squadron

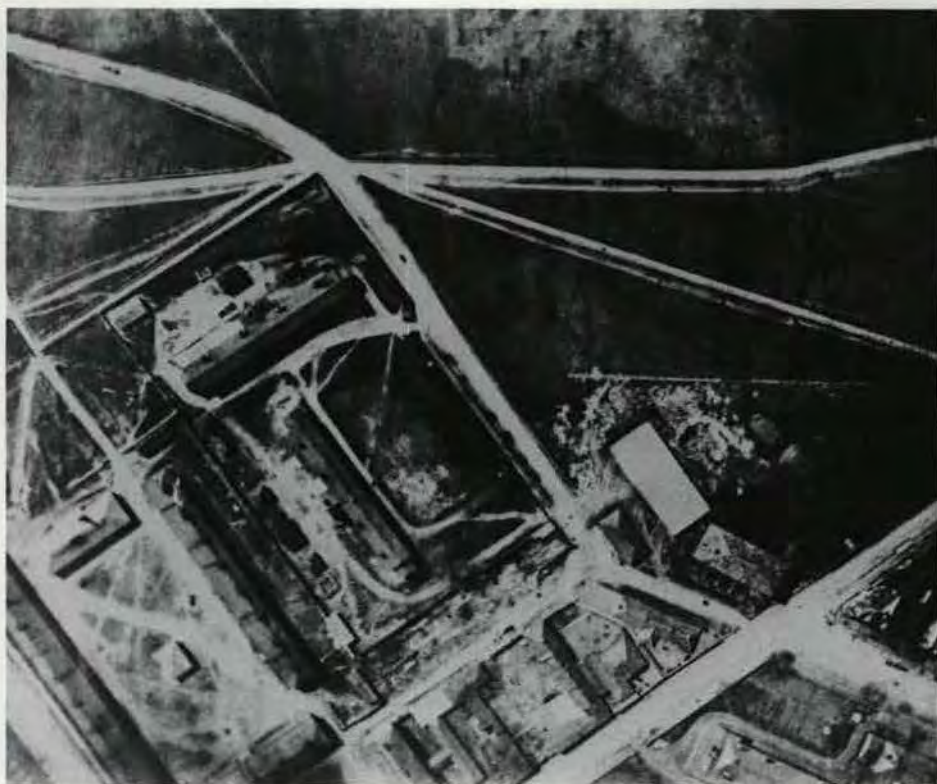
DAD Director Air Division, Naval Staff

DAO	Director of Air Operations
DCAS	Deputy Chief of the Air Staff
DHist	Directorate of History, National Defence Headquarters, Ottawa
DFC	Distinguished Flying Cross
DFO	Director of Flying Operations [in Air Ministry]
DFW	<i>Deutsche Flugzeug-Werke</i>
DSC	Distinguished Service Cross
DSD	Director Signal Division
DSM	Distinguished Service Medal
DSO	Distinguished Service Order
EA	enemy aircraft
FAI	<i>Fédération aeronautique internationale</i>
FBA	Franco-British Aviation
F/C	Flight Commander
FK	<i>Fliegerkompanie</i>
F/S	Flight Sergeant
F/S/L	Flight Sub-Lieutenant
GAE	<i>Groupe des Armées de l'Est</i>
GAF	German air force
GF	fleeting target ('fleeting target at ...')
GHQ	General Headquarters
GOC	General Officer Commanding
HA	hostile aircraft
HAG	Heavy Artillery Group
HD	home defence
HE	high explosive
HM	His Majesty's
HMCS	His Majesty's Canadian Ship
HMS	His Majesty's Ship
hp	horsepower
HQ	headquarters
hrs	hours
HSF	[German] High Seas Fleet
IAF	Independent Air Force
IAIAF	Inter-Allied Independent Air Force
IF	Independent Force
IMB	Imperial Munitions Board
KB	kite balloon
KIA	killed in action
kg	kilogram(s)
L	<i>Luftschiff</i>
lbs	pounds
LFG	<i>Luftfahrzeug Gesellschaft</i>
LL	'All available batteries to open fire' [very important target]
Lt	Lieutenant
LVG	<i>Luft Verkehrs Gesellschaft</i>

LZ *Luftschiff* Zeppelin
MC Military Cross
MD Military District
MG [or mg] machine-gun
MIA missing in action
mm millimetre(s)
MP Member of Parliament
mph miles per hour
MT mechanical transport
N 'guns in position at ...'
N Naval
NCO non-commissioned officer
nd no date given
NF 'guns firing in position at ...'
np no place of publication [given]
OBE Officer of the (Order of the) British Empire
OC Officer Commanding
OMFC Overseas Military Forces of Canada
PAC Public Archives of Canada
PC Privy Council [Order-in-Council no]
POW prisoner of war
PPCLI Princess Patricia's Canadian Light Infantry
RAF Royal Air Force
RCAF Royal Canadian Air Force
RCHA Royal Canadian Horse Artillery
RCN Royal Canadian Navy
RCNAS Royal Canadian Naval Air Service
RCNVR Royal Canadian Naval Volunteer Reserve
RE Royal Engineer(s)
RFC Royal Flying Corps
RG Record Group
RHA Royal Horse Artillery
RMC Royal Military College [of Canada, Kingston]
RN Royal Navy
RNAS Royal Naval Air Service
RNCVR Royal Naval Canadian Volunteer Reserve
RNVR Royal Naval Volunteer Reserve
rpm revolutions per minute
SAA small arms ammunition
SE southeast
Set set of notes and translation
SGR Steiger Collection
SL *Schütte-Lanz*
S/M submarine
SN steel-nosed
S of S Secretary of State [for War]

SS Sea Scout [non-rigid airship]
Tech Technical Officer
USA United States Army
USAF United States Air Force
USN United States Navy
VC Victoria Cross
vol. volume
WIA wounded in action
WPNF 'many batteries active at ...'

Introduction



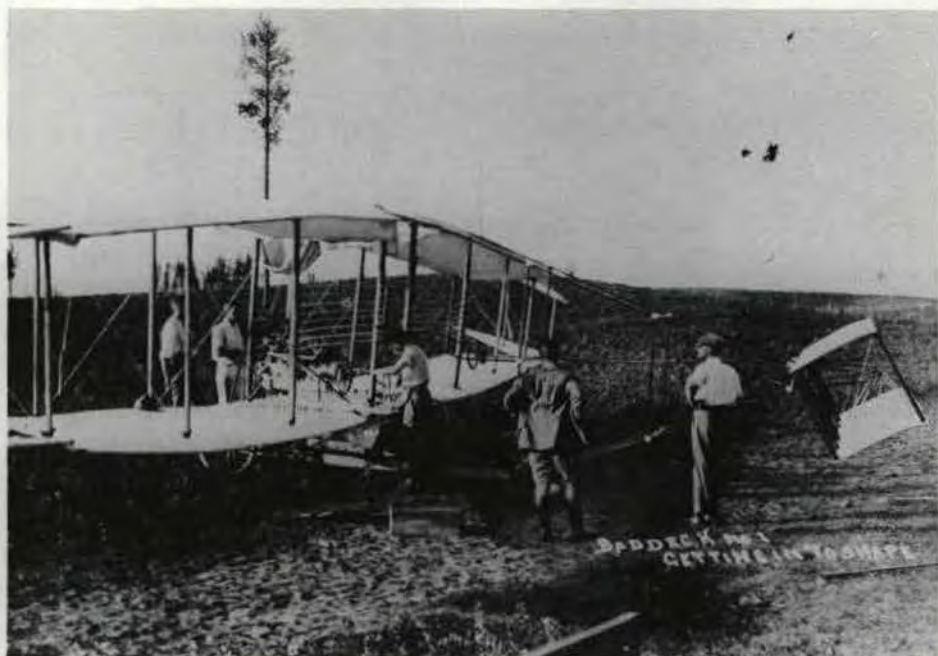
The first aerial photograph in Canada was taken by Capt. E. Elsdale, RE, using a clockwork-operated plate camera from a captive balloon at Halifax, NS, in 1883. (RE 12378-1)



The Aerial Experiment Association: Glen W. Curtiss, Alexander Graham Bell, J.A.D. McCurdy, F.W. Baldwin (c 28213)



The *Silver Dart*, J.A.D. McCurdy at the controls on 23 Feb. 1909 (RE 74-217)



The first all-Canadian 'aerodrome.' *Baddeck No 1* at Petawawa in early August 1909 (AH 170)

William Frederick Nelson Sharpe of Ottawa, one of the two founding members of the short-lived Canadian Aviation Corps, and Canada's first fatal casualty of the air, died in an accident in England, 4 Feb. 1915. This photo was taken at the Curtiss Flying School, San Diego, which Sharpe attended in December 1913 and January 1914. (PL 39933)



The Lohner 'aerodrome' in Ottawa during the winter of 1910 (RE 15360)



Brig.-Gen. David Henderson chaired the Aeronautical Committee set up to establish the form and direction of Britain's RFC in 1912. In 1918 he was to play a major role in the negotiations which accompanied the formation of the CAF. (PMR 21-520)



Brig.-Gen. Duncan Sayres MacInnes, CMG, DSO, of Hamilton, Ont., was a major in the Royal Engineers in 1912, when he was appointed secretary to the War Office's Advisory Committee on Aeronautics. (RE 67-471)

Military Aviation before the First World War

The first phase of the history of the Royal Canadian Air Force is inevitably a history of the part taken by Canadians in the British flying services. Or almost inevitably. There was a moment before the First World War when it appeared that as a result of the work of some distinguished Canadian air pioneers and of an air-minded staff officer in the Department of Militia and Defence the idea of a distinct Canadian air force might take hold. That moment passed quickly enough and, although the idea of a Canadian service never lacked supporters, it was not until after the war's end that a permanent organization took shape.

To blame particular ministers or civil servants for want of foresight would be easy but mistaken. In 1914 the air age was in its infancy. Very few Canadians had ever seen an aeroplane and only a handful had become pilots. A Canadian air force would have seemed to most Canadians an expensive and useless absurdity. Many had experienced difficulty enough swallowing the idea of a separate navy: the military applications of the invention of powered flight could well be left to Britain and other major nations.

All the great powers had, in fact, interested themselves to one degree or another in the potential military uses of aircraft before the beginning of the First World War. Long before powered flight the balloon had extended the dimensions of war. Its principal military role was reconnaissance, but it was also used for artillery ranging, transportation, and bombardment. As early as 1794 the armies of revolutionary France employed a balloon corps, and the French had also resorted to balloons in military campaigns in Algeria in 1830, in Italy in 1859, at the siege of Paris in 1870-1, and in Indo-China in 1884. In the American Civil War both sides had used balloons.¹

Until the last quarter of the nineteenth century the British, concerned mainly with small wars of empire, had displayed little interest in the military balloon, and the British colonies even less. Although a civilian aeronaut conducted some trials for the Royal Engineers in 1863, it was not until 1878 that they really became interested. One of the earliest successful balloon experiments in Canada occurred during August 1883 when Captain H. Elsdale of the Royal Engineers succeeded in taking aerial photographs of the Halifax Citadel, using a tethered balloon fitted with a clockwork-operated plate camera. A year later Elsdale commanded one of the first operational balloon sections in the British Army on an expedition to

Bechuanaland. By 1890 army estimates provided for a balloon section as a unit of the Corps of Royal Engineers. Its two balloons gave useful service in the Boer War; more important, the section trained a small number of officers and men who kept alive service interest in military aeronautics.²

The first controlled sustained flight of a powered heavier-than-air machine is generally accepted to have been made by Wilbur and Orville Wright at the North Carolina Kill Devil sand hills on 17 December 1903, when their aeroplane, the *Flyer*, flew 852 feet in fifty-nine seconds.* The Wright brothers' breakthrough had come because they daringly abandoned aerodynamic stability for an inherently unstable machine that could make a banked turn by the simultaneous use of wing warping and rudder. For a time, however, few believed that the Wright brothers had actually flown. It was not until the summer of 1908, when Wilbur Wright made more than one hundred successful flights from two fields near Le Mans, France, that it began to be accepted that a new age was dawning.³

The first serious aeronautical research in Canada had been undertaken by Wallace Rupert Turnbull of Saint John, NB, who built a wind tunnel in 1902. In October 1907 Alexander Graham Bell, together with two young Canadians, J.A.D. McCurdy and Frederick Walker Baldwin, and two Americans, Lieutenant Thomas E. Selfridge, USA, and Glenn Curtiss, formed the Aerial Experiment Association at Baddeck, NS, aimed at getting a man into the air with a heavier-than-air flying machine. Their early flights were made at Hammondsport, NY, as well as Baddeck. Following experiments in 1908 with a large man-carrying kite named the *Cygnnet*, the association built a biplane, the *Red Wing*, which made two short flights before it was destroyed in a crash landing. Bell and his associates went on to build the *White Wing* and the *June Bug*, both of which were flown successfully, and then the *Silver Dart* which was powered with a water-cooled, 8-cylinder engine. In September Selfridge became the first fatality of the air age in a crash near Washington. He had been a passenger in an aircraft Orville Wright was test flying for the United States Army. Despite the setback, the association continued its work at Baddeck where McCurdy made the first Canadian aeroplane flight in the *Silver Dart* on 23 February 1909. The Aerial Experiment Association dissolved at the end of March, having put four machines in the air.⁴

In the next few years the design and performance of aeroplanes improved with astonishing rapidity. By 1914 the official record for altitude was almost 20,000 feet, the speed record 126 mph, and the non-stop endurance record more than twenty-one hours. These performances, of course, were achieved by specialized aircraft designed for specific test purposes and it was not for several years that such capabilities could be incorporated in military aircraft.⁵

British military flying had a relatively slow start, initially being confined to experiments carried out at the Balloon School, Farnborough. Its most notable member was a civilian, S.F. Cody, who designed and tested kites, airships, and, later, aeroplanes. Cody's activities were makeshift: in 1908, for example, construction of *British Aeroplane No. 1* was delayed for several months because the only

* Oliver Stewart, however, makes a case for the Frenchman Clement Ader flying a powered heavier-than-air machine in 1890, 1891, and 1897. *Aviation: the Creative Ideas* (London 1966)

available engine was being used in the army's first airship, *Nulli Secundus*. At the same time more extensive experiments were being conducted by A.V. Roe, Horace, Eustace, and Oswald Short, Claude Grahame-White, T.O.M. Sopwith, and C.S. Rolls. Civilian development was so swift and vigorous that there appeared little need for the military to be in the vanguard. In April 1909 the War Office prohibited further aeroplane trials because of the expense – to that point, expenditure amounted to 2500 pounds sterling.⁶

Field Marshal Sir W.G. Nicholson, Chief of the Imperial General Staff from 1908 until 1912, regarded aviation as a useless fad. Even the Master-General of the Ordnance, whose responsibilities included aviation, had no strong belief in its military value. Such views were not so short-sighted as they now seem: balloons had been only of limited utility and in these early days airships and aeroplanes were singularly prone to spectacular mishaps. But a general opposition to innovation played a part as well. The extreme position was held by cavalry officers who claimed that aircraft would frighten their horses, an argument still heard in the 1930s. The Admiralty was not much more enthusiastic, but it had as a stimulus the potential threat posed by German airships. Defence against them, and the beginnings of its own airship programme, were its chief aerial concerns. The airship programme suffered a disastrous setback, however, when a large dirigible built by Vickers, and sardonically named *Mayfly*, broke her back in September of that year without having once been untethered.⁷

Despite official coolness, some progress had been made. In April 1908 a group of British members of parliament had formed an *ad hoc* Parliamentary Aerial Defence Committee, although it does not appear to have had much influence since more than three years later the War Office still had only fifteen aeroplanes. In 1909 an Advisory Committee on Aeronautics was created as a sub-committee of the Committee of Imperial Defence. This body, which included scientific, naval, and military representatives, had no policy function but was concerned solely with the technical side of aviation, supervising research into such matters as aerofoils, engines, lubricants, and aircraft stability.⁸ In October 1910 a division of the Balloon School, the Balloon Factory, was authorized to experiment with aeroplanes and to train aviators to co-operate with field troops. Early the following year the Balloon School became the Air Battalion of the Royal Engineers; its small establishment of fourteen officers and 176 other ranks was the forerunner of the British air service. In addition, a small number of individual officers learned to fly – either at the government's expense at places like the Royal Aero Club's Eastchurch grounds or through private tuition.

It would have been strange if young officers had not been attracted to the military possibilities of the aeroplane. In those early days powered flight had an irresistible glamour for the bold and the imaginative. Looking down from their open cockpits at the panoramic world spread out below, it must have seemed that they were the heralds of a new and tremendous dawn. The winds that tore at their goggles, the clouds through which they passed, the sweep and soar and dip of their flight brought a joyous exultation, so that even the mundane requisites of their calling – the exposure to vile weather, the smell of engine oil, the dirty work of maintenance and repair – were romanticized. At army manoeuvres in Britain and

India in 1911 a number of flights were made by such pioneering officers, and in January of the same year Captain William Sefton Brancker had put a Bristol Box-kite through its paces before a group of senior officers which included Lieutenant-General Sir Douglas Haig.⁹

At this juncture, nevertheless, British military aviation was lagging behind that of other countries. In 1911 the Americans employed aircraft for communications and reconnaissance during the Mexican Revolution.* In September 1910, at the French military manoeuvres in Picardy, aeroplanes piloted by both civilian and military flyers were used for reconnaissance and communications. In Germany the thoughts of the General Staff had also turned to aeroplanes; during the summer of 1910 the first steps were taken to form a corps of military airmen, with seven officers undergoing military flying training, and many more obtaining their pilot's certificates at private schools.¹⁰

Such continental developments, particularly the appearance of German military airships, the French use of aeroplanes in manoeuvres, and Italy's employment of both in the Libyan campaign of 1910-11, generated some public concern in Britain. In November 1911 Prime Minister Asquith asked the Advisory Committee on Aeronautics of the Committee of Imperial Defence to study the role and organization of military aviation. After an investigation conducted by Colonel J.E.B. Seely, the committee reported in February 1912 and its recommendations formed the basis of a government white paper of 11 April. The paper took note of foreign advances in aviation, but pointed out that the tactical and strategic uses of aircraft were still uncertain. It went on to say:

... it is clear that this country cannot afford to incur the risk of dropping behind other nations in this matter, and that every facility must be given for experiment and progress.

There are admittedly advantages in a policy of postponing the development of aeroplanes for naval and military purposes, and of leaving the pioneer work to private enterprise and to foreign nations, but it is clear that aeroplanes have now to a great extent passed out of the experimental stage as regards their employment in warfare, and an active and progressive policy has therefore become imperatively urgent.¹¹

The committee proposed that an aeronautical service called the Royal Flying Corps be formed, consisting of a Military Wing to be administered by the War Office and a Naval Wing under the control of the Admiralty. The government responded quickly. On 13 April 1912 the Royal Flying Corps was constituted by Royal Warrant. The regulations to govern the new body, which had been drafted by an informal committee composed of Brigadier-General David Henderson, Captain F.H. Sykes, and Major D.S. MacInnes,[†] were promulgated by special army order two days later.¹²

* In 1914, however, the United States would have only thirteen military aeroplanes. Arthur Sweetser, *The American Air Service* (New York 1919), 27.

† Major Duncan Sayre MacInnes was a Canadian, a native of Hamilton, Ont. He had graduated in 1891 from the Royal Military College, Kingston, winning the Governor General's Gold Medal and the Sword of Honour. He was commissioned in the Royal Engineers, served with distinction in the Ashanti Expedition of 1895-6 and in the South African War, and held staff appointments

The 1912 white paper set forth the role of the Military Wing as reconnaissance, prevention of reconnaissance by the enemy, communication between headquarters, observation of artillery fire, and infliction of damage on the enemy. *Field Service Regulations*, however, limited the role somewhat, specifying only the first two. The air service was to work in co-operation with the cavalry, but because night and weather might frequently ground its aircraft, the Military Wing was conceived as a supplement to cavalry reconnaissance and not as a substitute for it. The Naval Wing was to have a broader range of tasks. Reconnaissance was its chief function as well, but naval aeroplanes and airships would also be armed with bombs or machine-guns to attack enemy submarines and airships.¹³

The two wings of the Royal Flying Corps began to drift apart almost immediately. They were to be co-ordinated by an Air Committee, established as a permanent sub-committee of the Committee of Imperial Defence, but the sub-committee lacked executive powers and could offer advice only upon such matters as were referred to it. It was in no position to object when the Naval Wing started to give primary training at the Naval Flying School at Eastchurch next to the Royal Aero Club. Neither could the committee act when an Air Department was formed within the Admiralty, the term 'Naval Air Service' was adopted, and the correct name of the organization vanished from its official letterhead. From the outset naval ratings at air stations wore on their caps the name *Actaeon* (the ship on whose books they were borne) rather than that of Royal Flying Corps. On 23 June 1914 the Admiralty unilaterally issued regulations which established the Royal Naval Air Service. The regulations prescribed ranks, uniforms, flying badges, and pay and provided for direct recruitment into the RNAS, thus making it the exclusive naval air arm and a separate branch of the navy administered in much the same manner as the Royal Marines. As a result, by the outbreak of the First World War, Britain possessed two distinct air forces whose uneasy relationship could – and would – easily turn into acrimony.¹⁴

There is a sense, even so, in which all airmen and air forces belonged to the same community in the era before the coming of war. All were testing themselves against the unknown. Experimentation was the rule, but all concerned with military aviation tended to pose the same questions and, on the whole, to come up with similar answers. Every air force sought the ideal aircraft, not realizing, in those more innocent times, that constant change was to be the permanent condition of military aircraft design. The British, for example, issued specifications for the exemplary military aeroplane even before the establishment of the RFC, characteristically offering a prize for the best design. Trials held in August 1912 resulted in the victory of an aircraft designed by S.F. Cody but, though his *Cathedral* met all the formal requirements, its boxkite construction made it

in Canada between 1905 and 1908. In 1910 he was gazetted to the General Staff and in 1912 was secretary of the Advisory Committee on Aeronautics, a post which he held until the following year, when he was posted to the Staff College at Camberley. During the war he became Assistant Director and then Director of Aeronautical Equipment. He had served briefly and been wounded in France in 1914 and returned there in March 1917 as Commanding Royal Engineer to the 42nd Division. After nine months he was posted to headquarters as Inspector of Mines with the rank of brigadier-general. He was killed on 23 May 1918 while on active service at the front.

useless for military purposes. Indeed, the design subsequently proved fatal to its inventor.

A much superior design, the BE2, was also flown in the trials, but it was excluded by the rules because the Royal Aircraft Factory, a government organization that had grown out of the old Balloon Factory, had produced it. It later became the standard aircraft of the RFC. In addition, the Avro 504* and the Sopwith Tabloid, a machine originally designed for racing, were accepted. All these aircraft were tractors (that is, with the propeller mounted in front of the engine and generally in front of the main planes), with enclosed fuselages and a minimum of external bracing. Pusher aircraft with rear mounted propellers also had a future, primarily because of the field of vision they offered the pilot and the unrestricted field of forward fire open to a machine-gun. The Royal Naval Air Service took advantage of the development of practical flying boats, mainly the products of the designing skill of Glenn Curtiss in the United States and T.O.M. Sopwith in Britain, while both British and German naval aircraft were fitted with floats well before 1914.¹⁵

There was general awareness at this time that the value of aircraft would be much increased by equipping them with wireless. As early as 1908 the Balloon School had received signals from free balloons from up to twenty miles away. By 1912 airships equipped with two-way wireless were taking part in the annual British army manoeuvres, although engine interference cut down their ability to receive transmissions. In aeroplanes the wireless problem was more complex. Contemporary radio equipment was not light, power had to be provided by batteries, and aircraft had a very limited lifting capacity. The first message from an aeroplane to be received by a ground station was sent by the Canadian, J.A.D. McCurdy, during an air meet at Sheepshead Bay, NY, on 27 August 1910. With assistance from H.M. Horton of the De Forest Company, McCurdy fitted a 25-pound transmitter to a Curtiss biplane. A telegraphic key was attached to the control wheel and fifty feet of wire dangled from the machine as antenna, the aeroplane's guy wires being used as a ground. McCurdy circled Sheepshead Bay and tapped out 'Another chapter in aerial achievement is recorded in the sending of this wireless message from an aeroplane in flight.' Two miles away, on top of Sheepshead Bay grandstand, Horton picked up the message. During British Army manoeuvres a month later, Robert Loraine, flying a Bristol Boxkite, transmitted simple messages over a distance of a quarter of a mile. Particularly after 1912 progress was made employing generators driven off the aeroplane's engine. In 1913 a set was designed which screened off magneto interference and enabled the aeroplane to receive as well as to transmit signals. Meanwhile, the weight that aircraft could lift was steadily increasing.¹⁶

The development of aerial communications appeared to bring the direction of artillery fire from aeroplanes within the realm of the possible. As early as August 1911 the French carried out a number of experiments in observing, from an altitude of 4000 feet, garrison artillery firing at a range of 8000 yards. The Germans,

* Later versions of the Avro 504 were in use with the RCAF until 1934. J.A. Griffin, *Canadian Military Aircraft Serials and Photographs, 1920-1968* (Ottawa 1969), 4

too, were impressed with the possibilities of using aeroplanes to observe the fall of shot; in 1912 airmen were assigned to artillery practice schools. The British Army acknowledged the utility of wireless, *Field Service Regulations* stating that 'When sufficient aircraft are available they can be employed for the observation of artillery fire.' In practice, however, aircraft equipped with transmitters were so few that they were retained for reconnaissance and the guns had to be directed by flares and written messages dropped to the gunners.¹⁷

The first tests with machine-guns in aircraft took place in the United States in 1912. That same year Germany experimented with machine-guns fitted in dirigibles, and British and French pilots fired against ground targets from heights up to 3000 feet. No nation had yet solved the problem of firing through the propeller arc: aeroplanes engaged in these experiments were either pusher types or, if tractors, had a movable machine-gun installed on a mount in the cockpit and a pilot acutely aware of the danger of shooting off his own propeller. At Bisley, in November 1913, extensive air-to-ground firing was carried out from a Grahame-White Boxxkite with an air-cooled Lewis gun during which excellent results were achieved against stationary targets from a height of 500 feet. The Lewis gun was chosen as the standard armament for the RFC, but no operational aircraft was fitted with it until September 1914.¹⁸

Prior to the First World War there was a good deal of visionary writing about the effects of bombing from aircraft, but there was little connection between theory and reality. The earliest recorded instance of bombing experiments occurred in the summer of 1910 in the United States, when Glenn Curtiss dropped a number of dummy bombs on a target representing a battleship before a group of American naval and military officers. The first aerial bombardment took place in Libya in 1911, when an Italian pilot, a Lieutenant Gavotti, attacked a Turkish camp with four small bombs carried in a leather bag. Gavotti laid a bomb on his knees, fitted a detonator, and threw the bomb out, apparently causing some panic among the Turkish troops. In France, in 1912, the Michelin Tire Company offered a cash prize for accuracy in bombing. At the first trial, held at Châlons in April, only two bombs out of twenty-three hit the target. The same summer Geoffrey de Havilland demonstrated at Aldershot that the release of a 100-pound weight had no adverse aerodynamic effect on the aeroplane. The Admiralty experimented with the dropping of dummy bombs, although none of their trials was particularly impressive, and the enthusiasm of bombing advocates was further dampened by the ineffectual results of bombing in the Balkan Wars of 1912 and 1913.¹⁹

A number of other experiments were conducted at the same time. The air-launched torpedo, which an Italian airman apparently first demonstrated in 1911, was being developed by several countries in the years before the war. In Britain the Admiralty did not seriously tackle the problem until 1913. By July of the following year, however, a Short seaplane had been experimentally equipped to carry a fourteen-inch torpedo. Attempts were also made to fly aeroplanes from ships. An American, Eugene Ely, was able to land on and take off from a special deck on a warship in January 1911, when the ship was at anchor in San Francisco Bay. In 1912, when floatplanes began to alight successfully on rough water, it became possible for warships to launch and retrieve them at sea.²⁰

These developments had an impact, but on the eve of war no nation's aircraft were far from the experimental stage. Air forces were small and not one was a formidable military instrument.²¹ In Canada, where war seemed a remote and improbable eventuality, governments had given little thought to military aviation. Although Joseph L'Etoile of Ottawa wrote to the Department of Militia and Defence in 1886 offering to establish a balloon corps to be attached to the Active Militia, his credentials seem not to have impressed the authorities and his offer was rejected.²² Not until 1908 did the department begin to think seriously about the use of military aircraft, when Major G.S. Maunsell, the Director of Engineering Services, requested two weeks' leave in the United States in order to study various developments in military engineering, including 'ballooning and air-ships.' What recommendations he may have made on his return are not known, but Maunsell's superior, Colonel R.W. Rutherford, the Master-General of the Ordnance, proposed to the Militia Council in March 1909 that the Department of Militia and Defence adopt an aviation policy. One factor prompting his submission was probably the increasing number of proposals that the department was receiving from inventors and aircraft manufacturers who wished to sell their ideas, products, or services to the government. Rutherford submitted a list, commenting that 'this branch of engineering science has not hitherto been taken up by the Militia Department owing to the lack of specialists in the art, for although the number of inventors who have offered their services and their inventions to the Department is increasing, the nature of the majority of their proposals is so indefinite that no action could be taken with regard to them and therefore up to the present no application for funds for the purpose has been made.'²³ The Militia Council's response did not reflect great enthusiasm but at least it left the door open: 'It was decided that while the Department would do everything in its power to facilitate the work of experiments in aerial navigation by placing at the disposal of the inventors the assistance of men and equipment, no financial assistance could be rendered owing to there being no appropriation available.'²⁴

In the meantime, the survivors of the Aerial Experiment Association had gone their separate ways. Glenn Curtiss had returned to his home and engine plant at Hammondsport and begun making aircraft on his own. Baldwin and McCurdy had stayed at Baddeck where, with help from Bell, they formed the Canadian Aerodrome Company. Bell did his best to give the two young men a boost by speaking to the Canadian Club in Ottawa on 27 March 1909, before an audience that included the Governor General, the Duke of Connaught, and the Minister of Finance. The country, he said, should have 'the benefit of these Canadian boys ... The nation that controls the air will be the foremost nation of the world.' There was no official reaction to Bell's plea, but Baldwin and McCurdy continued with their experiments and began building their new company's first aeroplane, the *Baddeck 1*.²⁵

Even before Bell's Canadian Club talk, the *Silver Dart* had received a good deal of attention in the British, Canadian, and American press and the Governor General had officially drawn the attention of the British government to the flying being done at Baddeck. Such services 'should be retained for Empire.' Bell's speech and the *Silver Dart*'s widely-publicized flights may have been responsible

for Rutherford's next move. In a second submission to the Militia Council he suggested that Baldwin and McCurdy be given an opportunity to demonstrate their machines. Rutherford stressed the reports of successful trials and the interest shown by the Governor General. He suggested that, because Baldwin and McCurdy were Canadians carrying out their experiments in Canada, it should 'be ascertained on what terms and conditions they would be willing to give their services to the Department as specialists, also their views as to what funds they consider should be provided for the purpose of pursuing their studies on the Government's behalf.' They should also be asked what aeroplanes they had and whether they would be prepared to carry out demonstrations or experiments at Petawawa. The Department of Militia and Defence, after all, was the proper place for such work.²⁶

Rutherford's submission, which apparently aimed at an arrangement similar to that which the British had worked out with S.F. Cody in 1907-9, was studied by the Militia Council. Consideration was given at the same time to a proposal by M.D. Baldwin & Company Ltd of Montreal, which wished to demonstrate the military use of balloons. The council, acting on Rutherford's recommendation, declined the latter offer but decided to ask Baldwin and McCurdy to conduct flying trials at Petawawa, reiterating that no financial assistance would be given.²⁷

Early in June McCurdy informed the department that the *Silver Dart* had been shipped to Petawawa. He proposed to stop in Ottawa for talks with the engineering branch of the department - presumably Maunsell, who had pressed for the trials - before proceeding to Petawawa, while Baldwin would go there directly, to be on hand for the *Silver Dart*'s arrival. On 14 June the Petawawa camp engineer, Captain H.H. Bogart, was informed of the plans and told to assist the flyers in any way possible.²⁸

Baldwin arrived at Petawawa on 16 June and three days later Bogart asked the approval of Militia Headquarters to build a T-shaped shed to house the *Silver Dart*. Most of the materials were already on hand, but headquarters did approve the expenditure of \$5 for laths and tarred paper, instructing Captain Bogart to proceed 'provided it does not interfere with the artillery ranges.' This lavish investment represented Canada's first official expenditure in connection with military flying. When McCurdy arrived in July the two airmen began assembling the *Silver Dart*, which had been fitted with a new engine for the trials. They had the help of two engineer officers, Captain W.G. Tyrrell and Lieutenant G. St C.A. Perrin, as well as their employee, William McDonald. There were also interested spectators, among them a provisional militia lieutenant named A.G.L. McNaughton.²⁹

The preparations for the trials were widely publicized, and reporters and photographers gathered at Petawawa to witness the flights, their curiosity heightened by Blériot's conquest of the English Channel on 25 July. Of particular interest was the disclosure that, in addition to the *Silver Dart*, a new 'aerodrome' built by the two airmen at Baddeck would be flown at Petawawa. This was the *Baddeck 1*, which was now on its way from the Nova Scotia plant.³⁰

The *Silver Dart* was assembled with its new engine and ready for test flights on 31 July. Before sunrise on 2 August the aeroplane was wheeled out of its hangar and McCurdy took his place at the controls. Weather conditions were perfect. Baldwin swung the propeller, the engine caught, and the *Silver Dart* began to

move over the ground. McCurdy took off and flew about half a mile at a height of about ten feet before landing. The machine was turned around, and with Baldwin as a passenger, McCurdy flew back in the direction of the hangar. A third flight, towards the aircraft shed, was made with the workman McDonald aboard. The new engine performed well and the *Silver Dart*, which was carrying a passenger for the first time, achieved speeds estimated at between 45 and 50 mph, the fastest speed they had yet recorded.

The fourth flight, which proved to be the *Silver Dart*'s last, was made with Baldwin again aboard as a passenger. The aircraft covered three-quarters of a mile. As McCurdy prepared to land he was bothered by the rising sun, which was shining directly into his eyes. The front of the tricycle undercarriage struck the edge of a sandy knoll, causing the aircraft to bounce and then crash on its star-board wing. The centre section and the elevators were shattered and the wings badly damaged. Only the engine remained intact. Baldwin and McCurdy, however, escaped with only minor cuts and bruises. The two airmen now began assembling the *Baddeck 1*. 'Undaunted Aeroplanists Will Fly Again This Week,' the headline in the next day's *Toronto Star* trumpeted, 'McCurdy's Nose Still Bleeds From Cut and Baldwin Is Limping ...' 'The two flyers,' added the *Globe*, 'will have the sympathy of a host of well-wishers who will eagerly await their recovery and their further attempts to keep Canada abreast of the times in aviation.'³¹

Militia headquarters had been kept informed of developments by Captain Bogart and an official party from Ottawa arrived at Petawawa on 11 August. The party included Colonel Eugène Fiset, the Deputy Minister, Major-General W.D. Otter, Chief of the General Staff, Brigadier-General D.A. MacDonald, the Quartermaster-General, Rutherford, and Maunsell. That evening the *Baddeck 1* made a taxi run of about 800 yards to test the engine, but no attempt was made to take off. According to Maunsell, 'the engine worked beautifully and was easily started and controlled.'³²

Baldwin and McCurdy spent most of the next day working on their machine, tightening stays and making improvements, while enthusiastic reporters talked to the members of the official observer party. Nevertheless, one story, filed before the first flight of the *Baddeck 1*, indicates that the Deputy Minister may have already made up his mind before leaving Ottawa:

I think the aerodrome [sic] too expensive a luxury for Canada to indulge in at the present time ... It is largely in an experimental stage as yet ... the government has offered no inducement to them [Baldwin and McCurdy] in the way of money. We have merely given them attendant and camp privileges ... You cannot expect a young country like Canada to strike out and adopt a military aeroplane policy. We will probably follow in the footsteps of England along that line. It is, however, too early to speak of anything ...

Who knows what these aeroplanes can do? ... Can they lift a great weight? What protection would the canvas planes offer? I think they must find something of a more stable nature than canvas to cover the great wings with. We must wait a great many years yet and experiment much more before the true use of these machines can be demonstrated.³³

According to the same report, Rutherford could foresee a valuable scouting role for the machine but he doubted that Parliament would authorize the purchase of

any 'aerodrome.' General MacDonald was non-committal, saying only that the observers were there to see the aeroplanes fly, but also to assess Petawawa's suitability for artillery work.³⁴

Baldwin and McCurdy were in an awkward position. They now had an opportunity to show the authorities what they and their aircraft could do but although the *Silver Dart* had made more than three hundred successful flights, *Baddeck 1* had never flown. The first test flight would be the crucial one. Early in the evening of 12 August the craft was wheeled from its shed before the observer party, press, and a large crowd of artillerymen who had arrived for training. McCurdy climbed into the pilot's seat and McDonald swung the propeller. The engine ran smoothly and the aeroplane accelerated quickly. After a run of two hundred yards *Baddeck 1* became airborne and flew about one hundred yards, at a height of ten to fifteen feet. Then, because of a fault in the engine switch, further flights were postponed until the next day. Whatever reservations he may have had, Fiset was impressed by McCurdy's nerve in trusting himself to such a contraption. Rutherford expressed satisfaction with the test flight, despite its brevity, while General MacDonald added that 'if she can hop like that, she can fly.'³⁵

Having seen a single, brief flight, the official party returned to Ottawa, leaving Maunsell at Petawawa. Baldwin and McCurdy worked on the aeroplane the following day, strengthening the bow elevator controls and installing a new engine switch. The *Baddeck 1* was ready by 0600 hours but the wind delayed tests. An hour later the wind died and McCurdy took his place at the controls. Again, after running about two hundred yards, McCurdy lifted the nose and the aeroplane climbed very gradually. Unfortunately, after flying another hundred yards and gaining speed, the aircraft suddenly nosed up, climbed to thirty feet, stalled, and fell to the ground, landing hard on its after section. McCurdy was only slightly bruised, but his machine was badly damaged.³⁶

The trials were finished for the time being. The two airmen shipped what remained of both machines back to Baddeck, with the intention either of repairing the *Baddeck 1* and returning with it to Petawawa or of installing the undamaged engine in a second machine. As it turned out, however, they did not return to Petawawa, although they completed the *Baddeck 2* and kept Maunsell informed of their progress. He in turn maintained his interest in their activities and placed their reports on Militia Headquarters files.³⁷

Questions regarding the government's aviation policy were raised in the House of Commons in late November and early December 1909 by Thomas Chisholm, MP for Huron. Sir Frederick Borden, Minister of Militia and Defence, explained on 25 November that the assistance provided for the Petawawa trials had not included financial aid.³⁸ Three weeks later, in reply to further questions by Chisholm concerning government policy on constructing aeroplanes in Canada for military purposes, he said that the matter was being 'closely followed' but that no definite action had been decided upon. Borden then added: 'The government is being largely guided by the action of the War Office, in England, in this respect. It is thought that the question has hardly reached the stage that it is desirable for the Dominion government to spend money in assisting inventors, but all reasonable facilities will be afforded to persons, possessing satisfactory credentials, in the way of giving the use of government land for the purpose of experiment.'³⁹

The liaison between the two airmen at Baddeck and Militia Headquarters continued. At the instigation of the Duke of Connaught, the Directorate of Intelligence sent the pair a series of short digests of news items on aviation developments in North America and Europe. Many of the experiments were notably less successful than those of Baldwin and McCurdy. The first précis sent to the two flyers, covering the period from November to mid-December 1909, contained news, for example, of a German inventor, George Lohner, who was building a machine at the Exhibition Grounds, Ottawa, 'under conditions of secrecy.' The *Ottawa Evening Journal* described the 'drome' as about forty feet long and twenty feet high. It was constructed on the kite principle (Lohner was reputed to be a balloonist of note) and had 'many features new to airship construction.' 'The front portion from which a stick protrudes is known as the controller and is designed for raising and lowering the drome when in the air. There are two big triangular canvas surfaces, set horizontally, the front one being higher than the rear one.' The device was set on steel runners but had no engine, the inventor and his backers wishing to wait before taking that expensive step 'to see if it [the machine] will rise when pulled rapidly along the ground.'⁴⁰

In subsequent digests Baldwin and McCurdy learned of delays in Lohner's progress, and then of the failure of the first trial on 14 March 1910. The *Evening Journal* elaborated:

After they had got the aerodrome out of the shed and in such a position that the fierce wind did not strike directly against the surfaces of the canvases, something went wrong with one of the steel runners.

Mr. Lohner tightened up a couple of bolts and then the machine was attached to a rope drawn by Mr. E. Code's automobile. In some way the two steel runners at the sides, and the steel upright braces that supported them, did not seem to be strong enough, and when the wind blew from one direction and then from another, they weakened and gave way, first at minor points and later on at important ones ...

At one place the drome came in contact with a telegraph wire and the canvas of the controller was ripped up. Then when entering a gate that leads directly into the race track at the grounds, the drome struck the side of it and several sections were loosened, including many of the guy wires.

At this stage of the game a fierce gust of wind hit the machine so heavily that it could not be kept balanced, and it keeled right over on its side, the tips of the triangular shaped surfaces touching the ground and the strain doing considerable further damage to the steel and wooden sections of the framework.

Inventor Lohner got up on the side of the fence to ease the drome through the narrow space in a fence, but several wires just grazed the top of his head.

There were only about a dozen people on hand,* but several of them took great fun out of the doings. Although the portion of the race track where it was intended to pull the aerodrome at a high rate of speed to see if it would 'take to the air' had been reached, no attempt was made, because it was quite apparent by this time, that the machine was too badly wrecked - the runners being all bent and twisted.⁴¹

* Some four to five hundred spectators, 'including many ladies,' had been at the abortive trial two days before, on a Saturday. *Evening Journal*, 14 March 1910

In the summer, an automobile was able to raise the ungainly contraption two feet off the ground after dragging it for about a hundred yards at a speed of five miles an hour, an experiment that Lohner claimed as a 'highly successful' vindication of his design. Lohner seems to have disappeared soon afterwards, however, leading to a rumour in 1914 that he had been a German spy.⁴²

Meanwhile, Baldwin and McCurdy had completed some fifty flights with the *Baddeck 2* by November 1909. When Bras d'Or Lake froze they had transferred their flying to the ice and in March 1910 the militia department sent Maunsell to *Baddeck* to observe and report on the progress of the flyers. Although weather and mishaps restricted much of the flying to short hops, McCurdy was able to make several good flights during Maunsell's four-day stay, including one of six-and-a-half minutes' duration. Maunsell himself was carried as a passenger on two brief flights in the *Baddeck 2*, becoming the first Canadian officer to fly in a heavier-than-air machine while on duty.⁴³

A week after his return to Ottawa, Maunsell suggested three possible options. The first, establishment of an aviation section of the Royal Canadian Engineers, appeared to him to be wasteful because it might require years of work to attain the expertise already possessed by Baldwin and McCurdy. A second possibility was outright purchase of the aeroplanes. On 10 March, indeed, while Maunsell was at *Baddeck*, Baldwin and McCurdy had offered the two *Baddecks* to the government for \$10,000 and said they would give flying instructions to one or two officers. This would provide the government with the nucleus of a flying service and would enable Baldwin and McCurdy to carry on with their own development work at *Baddeck*. The third suggestion, and the one favoured by Maunsell, called for the department to offer the two airmen an annual grant to carry on their research; in return they would hold one aeroplane for instructing militia officers.⁴⁴

Rutherford summarized Maunsell's report and passed it to the Militia Council for consideration. He pointed out that the main troubles encountered by Baldwin and McCurdy in their flights with the *Baddeck 2* appeared to have resulted from an unsatisfactory engine and that better power plants were on order. He also explained to the council the approach of the British War Office towards aviation: 'to encourage experiments, but to buy nothing.' He, too, favoured Maunsell's third option: 'If we can retain Messrs McCurdy and Baldwin next year by giving them money for experiments – and Sir Frederick Borden believes he can get a vote – the War Office think we shall do quite right, but they would not advise us to merely buy a machine.'⁴⁵

The Militia Council agreed. Rutherford was told to prepare a report for submission to the Privy Council requesting approval of the policy, and to arrange to have an item included in the supplementary estimates for 1910–11. The report was passed to the Cabinet on 7 April, accompanied by a further supplementary estimate of \$10,000 for the flyers. It recommended that the grant be renewable annually at the discretion of the government, 'to enable them to pursue their studies in aviation, the said grant to be subject to such conditions as this Department may consider necessary to protect its interests, but to include provisos that they shall train such officer or officers in the use of their machines as the Department may desire.' Baldwin and McCurdy were to place a machine at the department's disposal whenever required and to give the department the right to accept or refuse

any invention or machine which they might produce, on terms to be arranged. They were also to carry out trials as required and open their factory to inspection. It was stipulated that the grant of \$10,000 was not to be used for the production of machines intended for public sale.⁴⁶

The Cabinet rejected the proposal. Rutherford went back to the Deputy Minister, Fiset, asking whether a grant of \$5000 could be made from the funds voted for the Engineer Services (Headquarters Reserve). 'If this is not done,' he pointed out, 'it is evident that we shall lose the services of this firm, and their experiments will cease. In fact they have already shut down their works awaiting assistance.' He was told to bring the matter up before the Militia Council, although Fiset added that 'I doubt very much if we have the power of dividing part of our vote for such purposes.' The Militia Council supported Rutherford and a request to use the \$5000 from the Engineering Service's vote was made to the Cabinet. This also was turned down. On 10 June Maunsell admitted defeat, if only temporarily. He cabled Baldwin and McCurdy that he was 'very sorry Department is unable to make you grant towards aviation this year.' Fiset confirmed the disappointing news in a letter to the flyers but he still held out some slight hope, promising that if they continued their work and still wished to associate themselves with the government, the matter would be brought up again the following year. Baldwin and McCurdy closed their plant and separated. Baldwin turned from aircraft construction and active flying to hydrofoil experiments; McCurdy went to the United States. Though their unique combination of engineering ability and flying experience was lost to Canada permanently, McCurdy would later make further contributions to Canadian aviation.⁴⁷

However, Maunsell had by no means given up the fight to establish a footing for aviation within the Canadian military structure. In August 1910 he recommended to his chief that \$10,000 be included in the 1911-12 estimates as a grant to Baldwin and McCurdy along the lines of previous suggestions. The Militia Council considered the proposal on 13 September, but perhaps fearing yet another rebuff from Cabinet, did not approve it. The same day that Maunsell submitted his proposal McCurdy wrote from New York telling of his latest accomplishment of sending wireless messages from an aircraft to the ground and inviting Maunsell to witness further tests. Maunsell was unable to attend but he asked McCurdy to keep him advised of developments.⁴⁸

Maunsell continued to press his case. In late October 1911 he and Fiset visited Atlantic City, NJ, to inspect the Verman-Seiberling dirigible *Akron*, which was being built for an attempt at an Atlantic crossing. In a joint report to the Minister, Maunsell and Fiset recommended against the department's buying or building a dirigible: 'It is thought that, for the present, it will be sufficient for this Department to secure say two aeroplanes, which have proved of such value in reconnaissance work, and train a few aviators at next year's training.'⁴⁹

The following month, at Maunsell's request, the British War Office was asked to provide information and advice 'relative to the best method of commencing the

* In 1928 McCurdy formed the Reid Aircraft Company with an airport near Montreal. A year later he became president of Curtiss-Reid Aircraft Company Ltd. He was Assistant Director General of Aircraft Production in the Department of Munitions and Supply, 1939-47, and Lieutenant-Governor of Nova Scotia, 1947-52. He died in 1961.

study of Aviation in the Canadian Militia, on a small scale, the best aeroplanes for instructional purposes and also the best for military purposes.' The War Office was also asked to advise on the staff and organization required to start a small (two machine) aviation corps. Maunsell, now a lieutenant-colonel, pointed out that the information would enable the department 'to make a start in the organization of the aviation section, which has become so important in Military operations.' In February 1912 the War Office replied that the employment of aircraft required both skilled military pilots and relatively large ground staffs. It recommended that a two-seater biplane with dual controls and 'plenty of spare parts' be used as a trainer aircraft. The trainer should be able to land at slow speeds and have controls similar to those on the machines selected for service use. The British included their latest specifications for a military aircraft.⁵⁰

Having obtained this information, Maunsell proposed that the department purchase one or two McCurdy machines at an estimated cost of \$5000 each and that McCurdy's services be obtained to train a few selected officers as pilots. The important thing, he felt, was to make a start: 'I am strongly of the opinion that it is not particularly important what design of aeroplane is chosen as a first step, as all the present designs will be obsolete within a few years, but the point is to make a start in the direction of training a few officers who would be capable of taking up the practical side of the question and not only learn to handle a machine but build them on the designs that develop from time to time.'⁵¹

The new Chief of the General Staff, Major-General G.J. Mackenzie, agreed, observing that 'a military organization which does not keep pace with the latest scientific developments must be hopelessly left behind by organizations which are alive to that necessity.' He pointed out, however, that the first thing to do was find if there were any funds available. The proposal was passed to the Deputy Minister, with the comment that money was available in the 1912-13 Engineer Stores vote for the purchase of an aircraft, and possibly for training, although the instruction might be charged to the training vote. Colonel Sam Hughes, now Minister of Militia and Defence, rejected the proposal and, Fiset reported, 'does not want any steps taken this year - neither towards training nor purchase of aeroplanes.'⁵²

When Hughes went to England to view the 1912 summer manoeuvres, Maunsell accompanied him to observe the operations of the new Royal Flying Corps. In his report Maunsell described the existing organization of the RFC, its tactical doctrine and equipment, and urged once more that training begin.⁵³ Maunsell's report went to General Mackenzie, who again agreed:

For the purpose of strategical reconnaissance, in particular, an army unprovided with aeroplanes will be severely handicapped.

The advisability of either commencing instruction in aviation, or of eventually adding aeroplanes to the organization of the Canadian Militia, is a question of policy.

If there is a probability of a Canadian Force being thrown entirely on its own resources, and having to act independently, the arguments in favour of inaugurating an aviation service are strong. If, however, a Canadian Force was acting with an army already provided with aeroplanes, the necessity would not be so pronounced.

Generally speaking, it can be no disadvantage for the Canadian Militia to keep abreast of other countries in the knowledge and application of this branch of military science, and

although funds for 1913-14 may not be available, I would recommend that provision be made in the estimates for 1914-15 for this service, even though it be commenced on a small scale.⁵⁴

Although no action was taken, some interest in aviation had taken root in the army. In July 1912 Militia Headquarters had received an application for pilot training from a young Royal Canadian Engineer, Lieutenant B.M. Hay.* He was told that 'the question of Military Aviation in this country is under consideration, but until a definite policy ... has been reached it is not contemplated to send any officers to attend courses at the present time.' In early December 1912 Captain P.S. Benoit, Lieutenant R.H. Irwin, and Lance-Corporal F.S. Brown, all of the Royal Canadian Engineers, applied to take aviation training, but Maunsell explained that 'the Minister does not wish Aviation taken up, at any rate, at present.' The following year the 6th Field Company, RCE, at North Vancouver unsuccessfully recommended that an aviation section be formed.⁵⁵

Before 1914 militia policy, in the main, kept in step with Canada's evolution from colony to self-governing dominion. The recall of two British general officers commanding the militia because they challenged the ultimate responsibility of the Canadian government, the creation of the Militia Council, the withdrawal of the British garrisons from Halifax and Esquimalt, and the growth of the Permanent Force were all part of the process by which Canada was to achieve autonomy and national self-respect. It was therefore regrettable that the governments of the day did not share Maunsell's practical and balanced enthusiasm for aviation. Unquestionably they did not because flight itself was new and strange, because of its possible cost, unknown but rightly suspected to be great, because the military importance of aviation had yet to be shown, and, most of all, because Canada seemed to have no more need for aeroplanes than she did for dreadnoughts. Their decision was not, in itself, so much a result of colonial-mindedness as of a cautious and realistic assessment of the country's peacetime military needs.

Some Canadian politicians may have had an intimation of the imminence of a major war in which Canada might be involved. None could conceivably have anticipated the coming importance of air power, nor the extraordinary response of thousands of young Canadians to the opportunity to join in the air war. Yet as a consequence of that decision, to be reaffirmed during the war itself, the history of Canadian airmen and soldiers took strangely different paths. Canadian flyers did not serve as members of a national expeditionary force led by its own officers and supported by the anxious concern both of government and people at home. Instead, they fought their war as colonial recruits for imperial forces; their services were swallowed in the anonymity of a large organization; and their welfare was the charge, not of their own government, but of that of Britain.

* Lieutenant Hay, who came from Woodstock, NB, got his wish several years later. After pilot training in England, he joined 25 Squadron in France during May 1916. He was severely injured in a landing accident when his FE2b overturned on 18 July 1916.

PART ONE
Canadian Training and Air Policy



Ernest Lloyd Janney, commander of the Canadian Aviation Corps. In April and May 1915 he operated a private flying-school at Lawrence Park, north of Toronto. (RE 20365)



The Burgess-Dunne No 1 – first and only aircraft of the Canadian Aviation Corps – being loaded aboard ship for transportation to England with the CEF in October 1914. It was in this seaplane configuration that the machine was flown from the Burgess-Dunne works in Marblehead, Mass., to Quebec City. (RE 17705)



A Burgess-Dunne No 1 in the air, being flown by Clifford L. Webster, test pilot. (Smithsonian)



As an RNAS pilot on the Western Front in 1917-18 (and a member of 'Naval Ten's' renowned 'Black Flight'), F/Cdr W.M. Alexander (right) was credited with 18 victories in 131 sorties and rewarded with a DSO. (RE 19247)



William Melville Alexander was an eighteen-year-old Torontonion trying to enlist in the RNAS when this picture was taken in 1915. (RE 19229)



Students and friends, Curtiss School, Toronto, summer 1915 (PMR 71-17)



F/S/L Bert S. Wemp was a Toronto newspaperman who graduated from the Curtiss School and joined the RNAS in 1915. The first Canadian to receive the DFC (instituted when the RNAS and RFC were amalgamated into the RAF), he was a major by the end of the war. In 1930 he was elected mayor of Toronto. (AH 591)



Capt. Robert Dodds, an instructor at Camp Mohawk during the summer of 1918. Dodds (from Hamilton, Ont.) went overseas with the CEF, but transferred to the RFC in October 1916. He destroyed or forced down eleven enemy aircraft, and was awarded the MC for a bombing attack on an enemy aerodrome. (RE 19917)



One of the three Curtiss F-type flying-boats operated by the Curtiss School in Toronto in 1915 flying over Toronto harbour. (Smithsonian)

The Young Man's Element —the Air



THE keen eye, the cool clear brain, the courage of youth, have won for the Allies supremacy of the Air. The world-famous aviators are young men.

In the profession of Military Aeronautics the rewards are all for the keen young man. No calling offers greater scope for individual accomplishment and bravery.

The Imperial Royal Flying Corps conducts in Canada its most efficient and most completely equipped training school. Young men of fair education, alert men 18 to 30 years old, are instructed in the highly specialized work of aerial observation and warfare. While training for their commissions, cadets receive \$1.10 per day. Class 1 men under the M.S. Act are eligible.

An interesting Booklet "Air Heroes in the Making," describes fully, the R.F.C. course of training. A copy will be sent post-paid to anyone who contemplates entering military life. Write to one of the following addresses.

Imperial Royal Flying Corps

With no air force of their own, Canadians were invited to join the R.F.C. This advertisement appeared in many Canadian newspapers. (AH 228-5)



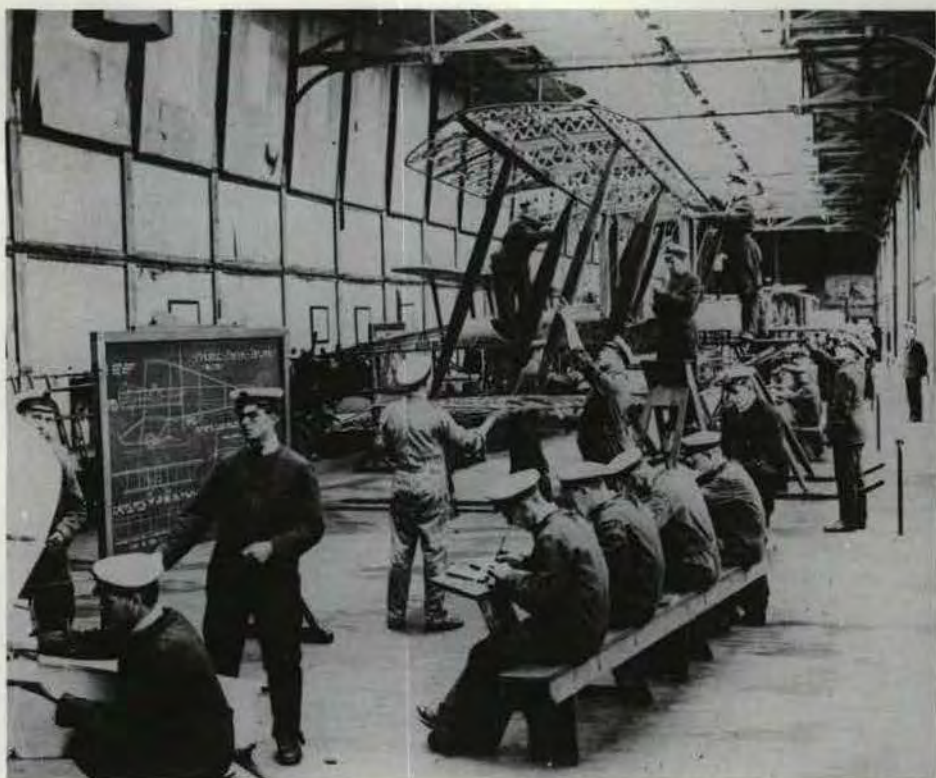
1915 crashes were rarely as disastrous as modern ones. Often the damage could be repaired on the spot – in this case the Wright School at Dayton, Ohio. (RE 18431-7)



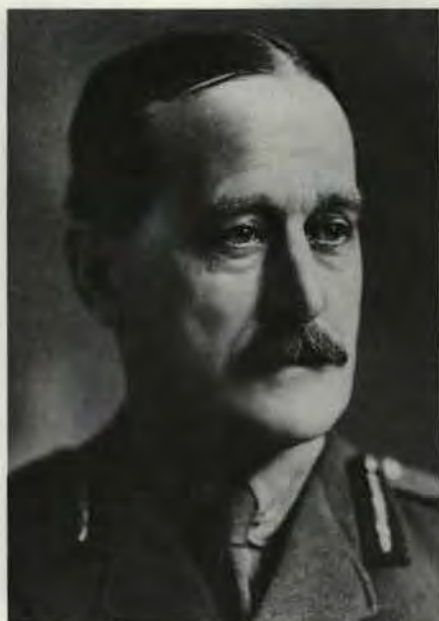
The Curtiss School, Toronto, in the summer of 1915. Standing in the cockpit and wearing a lifejacket is the instructor, Guy Gilpatric, who later achieved some literary renown in the columns of the *Saturday Evening Post* as the creator of Colin Glencannon, chief engineer of the SS *Inchcliffe Castle*. (AH 369)



A few miles west of Toronto, on the Lake Ontario shore, Long Branch housed the Curtiss School's land-plane section from July 1915. With three hangars and a prepared landing strip, it was Canada's first true airfield. (RE 19729-1)



Canadians who joined the British flying services in the dominion underwent extensive training overseas before joining an operational squadron. This picture shows RNAS probationary flight officers receiving ground school instruction at the Crystal Palace in England. (AH 456)



In October 1915 Maj.-Gen. Willoughby Gwatkin, the British officer who headed Canada's General Staff, recommended that 'for the present, at any rate, no attempt be made to organize a [Canadian] squadron ...' (PL 117508)



Prime Minister Sir Robert Borden at the Canadian National Exhibition Grounds, Toronto, inspecting Toronto's CEF Contingent, 5 Dec. 1914 (PA 61349)



Maj.-Gen. Sir Sam Hughes, Canada's 'intense, self-dramatizing, and mercurial' Minister of Militia at a Camp Borden review in 1916. Behind him, Brig.-Gen. W.A. Logie, commanding the troops. (PA 66774)

DROPPED FROM MID-AIR BY [REDACTED] AVIATOR'S



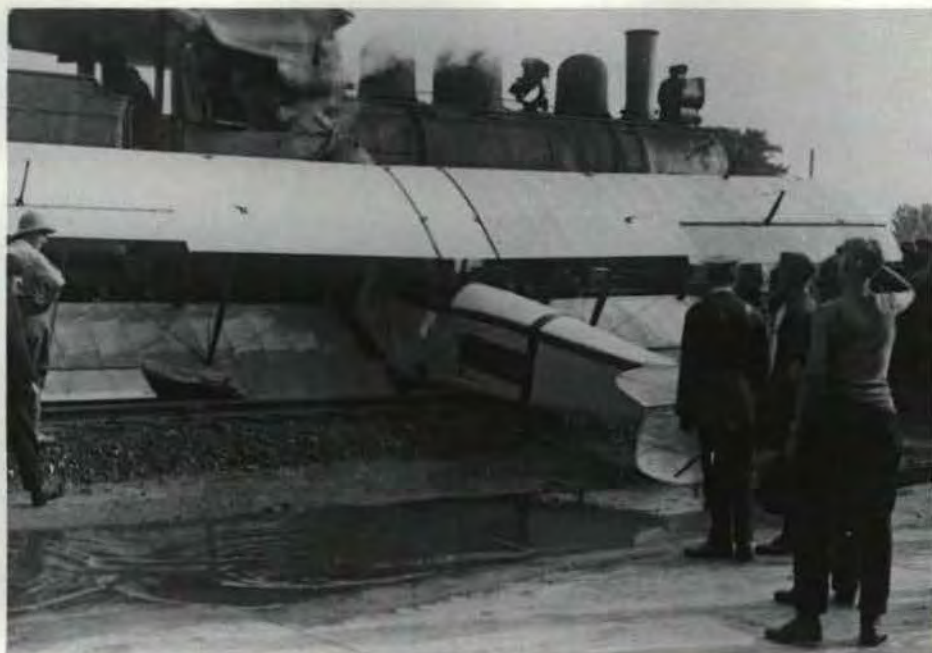
CANADA NEEDS HER OWN AIR-SERVICE

500 CANADIAN AVIATORS NOW IN IMPERIAL SERVICE
AT THE FRONT. HUNDREDS IN TRAINING. IT IS HOPED
THAT THE CANADIAN GOVERNMENT WILL AT ONCE
ORGANIZE THESE FLIERS UNDER CANADIAN CONTROL
AS CANADIAN CORPS.

Uncle Sam, take notice!

*Thousands of these cards were dropped
from aeroplanes in different parts of
Canada during the past year.*

Post card, dated on back August 1916, dropped from aircraft of the Curtiss School,
Toronto, urging the creation of a Canadian Air Service. (AH 361)



The air age meets the steam age. (RE 64-433)



RFC Canada cadets outside Burwash Hall, University of Toronto, April 1917 (RE 19008-1)



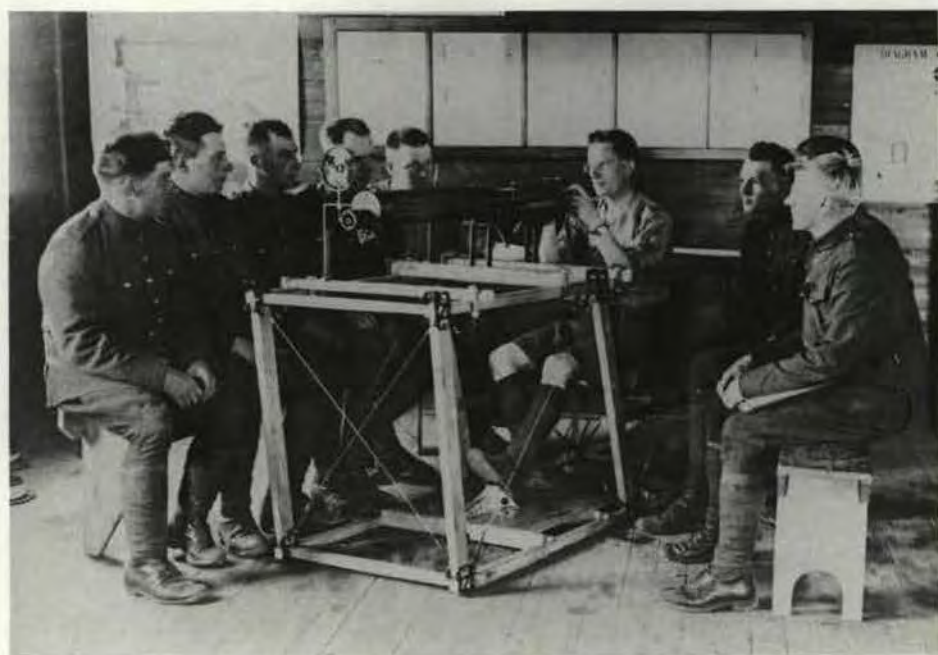
Pre-flight test of JN4 rigging by instructor, cadet, and ground crew (RE 19715)



Lecture on aircraft construction at the University of Toronto. The aircraft surrounding the class include, left to right, a Sopwith Camel, a BE2 without engine, an FE2, and a DH4 in the right foreground. (RE 19065-22)



'Hungry Lizzie.' One of the Packard ambulances that were maintained at readiness while flying was underway. (RE 1972-1)



Ground machine-gun instruction, Camp Borden, 1917 (RE 19070-12)



Canadian Aeroplanes Ltd, in co-operation with the Imperial Munitions Board, secured the right to manufacture Curtiss JN4s in Canada. A factory was built on Dufferin St in Toronto, going into operation in April 1917. (RE 19062-11)



Cadets under instruction at the School of Military Aeronautics, Toronto, are shown with a cut-away of a JN4, the RFC's standard trainer in Canada. The facilities of the University of Toronto provided a comparatively luxurious environment for study. (RE 19062-40)



RFC Canada cadets were taught foot and arms drill by men like F/S F. Sedgewick before they graduated to aeroplanes. (PMR 78-613)



Capt. Vernon Castle, half of the famous dance-team of Irene and Vernon Castle, an instructor at Camp Mohawk during summer and autumn of 1917. He was later killed in a crash in Texas. (RE 13533)



Cadets of the US Signal Corps Aviation Section under training at Camp Borden (RE 20055-1)



JN4a and drogue used for aerial machine-gun training at the School of Gunnery, Camp Borden. The drogue was towed further behind the aircraft than as demonstrated in this picture. (RE 20804-3)



Off to work marching behind their own band, RAF recruits at Camp Borden leave their living quarters for the flying field on a summer morning in 1918. (RE 64-505)