

## Earning Their Wings: British Pilot Training, 1912-1918

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## Abstract

This thesis outlines the development of Royal Flying Corps's (RFC) training programme from 1912 to 1918. It is based largely on archival sources from the National Archives and Imperial War Museum (London) and the Bundesarchiv (Freiburg, Germany). It considers the changes to the theoretical, practical and in-flight instruction methods used by the Royal Flying Corps. Within this discussion it analyzes the difficulties encountered by the RFC while attempting to train their aviators. It argues that initially the training programme was a detriment to British war effort in the air, as many pilots entered combat without sufficient training. This, however, was not the result of a flawed training regimen. Actually, the RFC training programme remained in tune with the realities of the war over the Western Front. The problems encountered by the RFC were largely the result of the circumvention or ignorance of the training programme by instructors. Nevertheless, British pilot training improved as the war went on both theoretically and practically and ultimately became more efficient than the training programmes in France and Germany. It pays special attention to the use of dual-control aircraft for the purposes of training and the positive effects these changes had on the British war effort. It also touches on some thematic issues such as gender, individuality, modernity and technology.

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## Introduction

On November 6, 1913, First Lord of the Admiralty Winston Churchill visited the year-old Central Flying School (CFS) at Upavon. He toured the school's workshops, barracks hangars, and mess halls. Despite the stormy weather, Churchill even took a twelve-minute ride in a training aircraft with Major C. L. Gerrard, one of the school's instructors. At the time of Churchill's visit there were thirty students under instruction at the CFS. These men constituted the entirety of those being trained as combat aviators by the British military less than one year before the beginning of the First World War. Four days later, during a speech at the Guildhall in London, Churchill stated that "the enduring safety of this country will not be maintained by force of arms unless over the whole sphere of aerial development we are able to make ourselves the first nation."<sup>1</sup>

It is entirely possible that an audience member at that speech leaned back in his chair and thought "how are we going to go about doing that? What good will it do? What role can the 'aeroplane' possibly play?" Or, "how are we going to teach our young men to fly?" The library of literature on aviation during the Great War is vast, and numerous historians have provided answers to the first two questions. Nevertheless, most historians who have examined aviation before and during the

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<sup>1</sup> Winston Churchill, "Naval Developments, November 10, 1913, The Lord Mayor's Banquet, The Guildhall, London," in *Winston S. Churchill: His Complete Speeches, 1897-1963, Volume II* (London: Chelsea House Publishers, 1974), 2183.

First World War have not provided an extensive answer to the final question. Combat flight training has received short treatment in most general histories of the Great War in the air, even though it should be obvious that the first airmen were not born with the knowledge of how to fly an aircraft. Although some were more adept than others, flying an airplane, let alone doing so in wartime, remained a skill that had to be taught. The primary goal of this thesis is to examine how Great Britain taught its earliest aviators how to fly and what effects these methods had on the British war effort. An example of what historians refer to as “new” military history, this thesis is principally concerned with the institutional and educational process by which a dramatically new technology was incorporated by a major force as a standard weapon of war. Also in keeping with the “new” military approach, this thesis will, where possible – and sometimes indirectly, rather than directly – touch on other social and cultural questions, as described in Chapter One.

Until April 1918, Great Britain operated two military air services: the Royal Flying Corps (RFC) and the Royal Naval Air Service (RNAS). This thesis will focus on the former. When the war began, the RFC was a small and generally insignificant element of the British war effort. However, by war’s end, it had detached itself from the army and had become a service in its own right, the Royal Air Force (RAF) with approximately 30,000 officers. The RFC, being much larger and playing a more decisive role than its naval counterpart (which the RFC actually absorbed in 1918), has left behind a large volume of documentation allowing those studying it an effective way to measure the pulse of British aviation before and during the Great War.

When established in 1912, the RFC was venturing into uncharted waters in every aspect of its operation. Only a handful of men in Britain knew how to fly, and even fewer had ideas of how to apply the airplane in wartime. As a result, most military leaders saw the plane simply as a novelty, something without applications to the battlefield. Even more important to this study, there was no precedent telling the first instructors what methods they were to use to teach their pupils how to fly; there were no blueprints of how to arrange a flight school and no course syllabi lying around from years gone by. When the first pupils arrived at the Central Flying School (CFS) on Salisbury Plain they were laying the very first stones in the foundation of contemporary pilot training methods. To exacerbate problems associated with the newness of the aircraft, a general European war began just over two years after Britain started to train military pilots. Thus, many of the RFC's growing pains had to be endured during wartime. For all the combatant nations, the newness of World War I-era aircraft cannot be overstated, and it became a major source of problems for the RFC training programme as the war progressed.

The RFC proved to be more equal than some have maintained to the task of keeping current with an air war that changed steadily between 1914 and 1918.<sup>2</sup> The RFC's syllabi and training regimen remained fluid throughout the war. As the war in the air evolved from one of strictly aerial reconnaissance in 1914 to increasing air-combat, and the occasional bombing mission in the middle years, to one that closely resembled the air war fought during World War II (with air superiority, strategic and tactical bombing, and close air support all emerging as priorities) the RFC adapted

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<sup>2</sup> Ralph Barker, *A Brief History of the Royal Flying Corps in World War I* (London: Robinson, 1995).



and changed its training programme to suit the needs of the service.<sup>3</sup> As will be shown, the training regimen undertaken by recruits in 1914 was vastly different from the one in 1916, and the instruction received by pupils in 1918 would have been almost unrecognizable to those instructed in 1914. Chapters Two and Five will demonstrate that the RFC used training methods similar to those employed by Germany and France, and that by the end of the war British pilot training had become more efficient than that of France. This assessment differs significantly from that put forward by many pilots who went through the programme – and described RFC methods as reckless or criminal – as well as those few authors who have written about British pilot training.<sup>4</sup> While the RFC was not without its flaws, the British did no worse than their foreign counterparts in devising ways to cope with an unprecedented set of military, technological, and educational challenges. And as much as possible, the RFC worked constantly to stay theoretically and practically in tune with the ever-changing realities of the air war in Europe.

None of this, however, is to say that the RFC was without shortcomings. Serious problems, even failures, plagued its work. As the war escalated dramatically in 1915 and 1916, the RFC expanded rapidly – beyond its capacity, in fact – and endured a corresponding increase in casualties. In an effort to fill the cockpits of

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<sup>3</sup> Air superiority involves an air arm taking, and keeping control of the skies. This allows other aerial units (such as reconnaissance aircraft and bombers) to carry out their tasks with minimal interference, while preventing the enemy from doing the same. Air superiority became increasingly important as the war went on and changed hands numerous times. Frequently, these changes depended on technological advances (mostly Germany developing a new technology and the Allies developing a counter-technology after). At other times it depended on tactics. More often than not the British pursued a more aggressive aerial doctrine than Germany or France, often allowing them to acquire control of the skies, but at a high cost in human life and airplanes. The war closed with the Allies in firm control of the skies over the Western Front.

<sup>4</sup> Frank D. Tredrey, *Pioneer Pilot: The Great Smith-Barry Who Taught the World to Fly* (London: Peter Davies, 1976).

new aircraft and replace pilots who had died, the overstressed RFC training programme placed an understandable, but unfortunate, emphasis on speed over quality. Amid this atmosphere of haste in the RFC training centres, hundreds, perhaps thousands of pupils were not properly qualified. In some extreme cases, instructors actually falsified student records to ensure a quick graduation. Over time, the RFC worked to solve this problem throughout the war by implementing standardized pupil-to-instructor ratios. Despite this, keeping up with the steady influx of manpower was one of the RFC training programme's primary concerns throughout the war.

Instructors themselves presented certain problems – some of them with deep roots in the Victorian and Edwardian education system – throughout the war. Consistently, the relationship between pupil and instructor was poor, as the majority of RFC instructors were either too inexperienced or too apathetic to teach flying effectively. Even if an instructor was capable of teaching students with any insight, he was often so overworked that his expertise had little meaningful impact. Eventually, the RFC added a mandatory instructor training course in July 1917.

This step was nothing short of revolutionary. The new course was based upon a system developed by Major Robert Smith-Barry in 1916 and implemented at the Gosport Flying School in January 1917 – hence its common name, Gosport System. This method utilised airplanes with two sets of controls (dual-control) and an instruction method that always placed the pupil at the controls of the aircraft, a considerable change from years prior. Once the success of the system was noticed, the RFC ordered that all instructors were to be trained in this method, which

eventually lead to all cadets being trained as such. The Gosport System helped revolutionize pilot training and ultimately saved countless British lives in the last sixteen months of the war.

Another long standing problem involved morale. Few things are more common than for new recruits to resent certain aspects of their basic training and to have a less than ideal relationship with their instructors. More so than normal, however, RFC cadets, as shown in chapters three and four, lamented the relationship they had with their instructors and longed for a more cooperative atmosphere. The relative novelty of the airplane brought about an unusual state of affairs in military education: in many cases, those who instructed had little or no more experience with the subject of instruction than those they instructed. It appears that British pilot trainees felt warranted – perhaps to a degree unprecedented in the country’s military history – in viewing their teachers as nearly their equals and, therefore, feeling entitled to a more cooperative relationship. Nothing of the sort actually happened, and cadet disappointment ran high as a result. Moreover, the RFC training programme inadvertently instilled a somewhat schizophrenic mindset in its pilots. RFC rhetoric stressed the pilot’s unique qualities and elite status within the military overall. On the other hand, RFC failures to instruct all pupils adequately left many British pilots without confidence in their abilities or in the worth of what they had been taught.

Nonetheless the RFC contended with and, arguably, overcame these problems. This thesis will attempt to explain how. Chapter One will deal with historiographical questions; the four chapters that follow will proceed

chronologically. Chapter Two will focus on the pre-war years and the origins of the RFC training programme. Chapter Three will cover the period from the battle of the Marne (September 1914) to the Somme Offensive (late 1916), concentrating primarily on the manpower crisis facing the RFC. Changes to the RFC programme, especially those made by Smith-Barry, will form the subject of Chapter Four, which also examines the pupil-instructor relationship in detail. Chapter Five will take up the last eighteen months of the war and conclude with an evaluation of the Gosport System.

## Historiography and Research Questions

Hundreds of books and articles have been published on air combat during the First World War. However, as noted in the introduction, the majority provide no discussion of pilot training. In the British case, there are but a few works devoted to pilot training. A clear gap therefore exists in the historiography of British military aviation both before and during the Great War and this thesis will attempt to fill it, focusing primarily on two questions: how were British pilots trained and what impact did their training have on the British war effort in the air? In answering these questions, this thesis will paint a day-to-day portrait of the average RFC cadet: his social origins, what he was taught and how he was taught it, and how he was evaluated.

A number of other questions will be examined in varying degrees. First, was British pilot training (and pilot training in general) during the Great War as poor as most authors have claimed it was? Second, how did pupils perceive their instruction and their instructors and how did pupils and instructors relate to one another? To a lesser degree, this thesis will examine the similarities and differences between British training and that in France and Germany, in order to contextualize certain arguments. Finally, this thesis will, albeit indirectly, address broader issues such as the role of aviation in influencing how Western societies related to war, and its

technology and how ultimately modernity. Also under consideration will be how British methods of pilot training grew out of deeper social and educational dynamics; and the question of how the World War I pilot reflected past or future ideals of masculinity and the soldierly experience.

The remainder of this chapter will first discuss the existing literature and primary sources directly related to the topic of British pilot training. It will then turn to the various historical literatures with which this thesis will engage. Among these are military history in general and the history of aviation, as well as works focusing on technology and society, education in Britain and masculinity.

#### Existing Literature and Primary Sources

There are a number of reasons for the lack of extensive studies of British pilot training during the Great War. First, many historians tend to focus tightly on technical aspects when examining the airplane.<sup>1</sup> Furthermore, air combat in the Great War, especially the early years, was on a small scale. This may have resulted in pilot instruction being relatively ignored. Even more simply, it is entirely possible that many historians have just taken for granted how pilots learned how to fly. This is not to say, however, that valuable literature devoted to pilot training does not exist. *Pioneer Pilot: The Great Smith-Barry Who Taught the World to Fly*, by F. D. Tredrey, provides an insightful analysis of the man who developed the Gosport system (a topic that will become important in Chapters Four and Five).<sup>2</sup> Tredrey structures his book as a biography of Robert Smith-Barry; consequently, he

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<sup>1</sup> John Morrow, *The Great War in the Air* (Washington, DC: Smithsonian, 1993).

<sup>2</sup> Tredrey, *Pioneer Pilot*.

often inadvertently over-emphasizes his role in British pilot training and limits his discussion to his protagonist.

The key problem with existing examinations of pilot training is that most do not give it enough attention to provide a thorough analysis of the subject. For example, John Morrow's *The Great War in the Air* contains little discussion of the subject in its 378 pages.<sup>3</sup> Additionally, works by Geoffrey Norris, Lee Kennett, Alan Clark, Sir Walter Raleigh, and Ralph Barker devote, at the very most, a chapter (Kennett) within their general histories of the First World War in the air.<sup>4</sup> This, however, may be an unfair criticism, as the majority of these works encompass the entire air war and all its elements, leaving little room to discuss pilot training. Nonetheless, even more pointed discussions fail to give substantial attention to pilot training.<sup>5</sup> This lack of attention has led to a few fundamental problems within examinations of pilot training. First, there is often no mention of its evolving nature; most discussions capture pilot training during a moment in time: Barker (1915) and Kennett (1917), for example. Furthermore, without a detailed analysis, or full consideration of the newness of the airplane, British training programmes have often been anachronistically labelled as poor. In any case, in most instances a reader who puts down a book on First World War aviation emerges with little or no idea of how pilots learned to fly.

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<sup>3</sup> Morrow, *The Great War in the Air*.

<sup>4</sup> Geoffrey Norris, *The Royal Flying Corps: A History* (London : Frederick Muller Ltd, 1965); Lee Kennett, *The First Air War: 1914-1918* (New York: The Free Press, 1991); Alan Clark, *Aces High*, (London: George Weidenfeld and Nicolson, 1973); Sir Walter Raleigh, *The War in the Air* (Oxford: The Clarendon Press, 1922); Barker, *The Royal Flying Corps*.

<sup>5</sup> Lieutenant Stefan M. Peterson, "What did it Take? The Qualities of Successful Aviators in WWI," in *Air Power History* 37, no. 3 (1990) : 47-53.

This thesis will attempt to answer its key research questions by focusing on a wide variety of documents held at the Public Records Office (now officially known as the National Archives) and the Imperial War Museum, both in London, and the German *Bundesarchiv*, located in Freiburg. These archives were visited over a six week period in the early summer of 2005. These sources include personal diaries and reminiscences, pilot log books, casualty reports, numerous letters and communiqués, course syllabi, training manuals, report cards, class schedules, and statistical data. The nature of these records have suggested answers to the aforementioned questions that focus not only on pilots' combat experience and the decision making of senior officers, but also on the experiences of ordinary cadets in the training schools.

The large volume of literature written on the RFC during the First World War has left few stones unturned. Most of these works have used a combination of personal accounts, official documents and secondary sources. Perhaps the most important set of documents utilised in previous works is the National Archives' (PRO) Air Series, which covers aviation in Britain from 1862 to 1992. Many key books written on the Royal Flying Corps from Sir Walter Raleigh's official history, to the newest works by Ralph Barker, rely heavily on these documents found in the Kew archives. This series also provides the bulk of the raw materials used for this thesis. These include many highly helpful survey documents; two very good examples are the "Summary Notes on Training" for 1917 and 1918. Similarly, the operational log books of the Central Flying School were invaluable in determining the nature of day-to-day life at the schools, especially in the early years.



Another part of this collection that has proven particularly useful is the Air 1/2387, 2388 and 2389 series. These files contain hundreds of personal recollections, recorded in the 1920s, of those who served in the RFC and later the RAF during the Great War. The fact that these recollections were recorded after the war gave those writing the opportunity to compare training at different periods of the war. For example, a number of these pilots underwent training in the pre-Gosport system, and then returned as instructors post-Gosport. Their commentaries on this particular issue have proven quite valuable. They have also been extremely useful in attempting to determine the nature of the pupil-instructor relationships within the flight schools. Whatever the focus of enquiry may be, these reminiscences have helped in adding a personal feel to many of the arguments.

Also important are the holdings at the Imperial War Museum, which contain numerous personal dairies and flying logs. These flying logs and dairies proved especially useful in determining the flying time of pupils before they were moved on to different training aircraft or granted their wings. Additionally, instructors' log books effectively displayed the workloads being faced by instructors while on duty at the flying schools. In many cases these flying logs were annotated, which provided an insight into the thought process of those writing them. Additionally, the Imperial War Museum holds Robert Smith-Barry's paper on flight training, written in 1918.

The archival evidence found in Germany was, unfortunately, not as extensive as that found in the United Kingdom. It is entirely possible that these documents, like many German archives relating to the First World War, were destroyed between

1939 and 1945. Nonetheless, there were still considerable holdings in the Freiburg archives relating to German pilot training. Some of these included training manuals and pamphlets from private training firms, instructional manuals, photographs, pilot log books and diaries.

Many historians have used a number of the same documents which have been applied to this thesis; they have not, however, been examined with the aforementioned research questions in mind. What work that has been conducted on pilot training generally under-utilises these documents. For example, the most comprehensive work on British pilot training to date (Tredrey's *Pioneer Pilot*) pays little attention to these very important archival sources in its examination of the Gosport System.<sup>6</sup> Additionally, most books on the RFC during the Great War use the Air Series, the files at the IWM along with other archival sources such as the RAF Museum, which was not visited for this work; however, they do not use them for their analyses of pilot training. For example, Lee Kennett's chapter on training in *The First Air War* is based entirely on secondary literature, as is Michael Paris's brief section on training in *Winged Warfare* (1992).<sup>7</sup> In any case, the archival sources used in this thesis have not hitherto been closely examined with British pilot training in mind.

#### New vs. Traditional Military History

Chronological narratives, command-level discussions of strategy and tactics, and descriptions of battle more or less defined works of military history until the mid-1960s. They focused squarely on the causes, conduct and consequences of

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<sup>6</sup> Tredrey, *Pioneer Pilot*, 153-156.

<sup>7</sup> Kennett, *The First Air War*, 113-132.

warfare. These analyses of war, within the vacuum of strategy and battle, convey a wealth of information regarding how why and where wars were fought, but offer less insight into warfare as part of wider society. For a variety of reasons, this method of practising traditional military history came into crisis during the Vietnam War and the years that followed. Society was largely angered by the bloodshed of Vietnam and many had lost interest in the study of warfare. Simultaneously, the practice of history was changing: social and cultural history were gaining recognition and importance within the academy, while postmodernist and poststructuralist theories were becoming increasingly influential.

Despite brilliant works by scholars such as John Keegan, the author of the groundbreaking *The Face of Battle*, military history found itself in a “crisis” during the late 1970s and 1980s – as scholars such as Walter Kaegi and Peter Paret pointed out in 1981 and 1991, respectively.<sup>8</sup> Military historians responded to this threat by embracing new historical approaches and ideas; the result has come to be known as “new” military history. “New” military history can be defined as a shifting of the analysis of military-related questions away from narratives centred exclusively on combat, strategy and politics to the incorporation of a wide variety of historical themes in an effort to understand better both the military and the society which it serves. Projects reflecting this new approach focus on the connection between the military and economics, society, science, technology, and sexuality; they would be

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<sup>8</sup> Walter Kaegi, “The Crisis in Military Historiography” in *Armed Forces and Society* 7, no. 2 (Winter 1981): 299. The crisis which Kaegi referred to was and is what he calls the neglect of “military history in order to concentrate their efforts on economic, social and intellectual phenomena.” Kaegi did not necessarily call for the adoption and practice of what is now thought of as “new” military history. Instead, Kaegi contends that military history required a sort of kick in the pants; it needed to be more innovative while staying true to itself. John Whiteclay Chambers, “Conference Review Essays: The New Military History: Myth and Reality” in *Journal of Military History* 55, no. 3, (July 1991): 395.

more likely to incorporate methodologies from disciplines such as anthropology, philosophy and cultural studies. Not all practitioners of military history have embraced these changes. John Lynn, for example, laments that “new” military history has transformed military history into another discipline altogether: “war and society.”<sup>9</sup> He argues that this change makes unnecessary apologies and that military history has become the victim of academic faddism. Whether or not they share Lynn’s bitterness, many scholars, such as Keegan, caution that, “new” or not, any study calling itself military history, must “in the last resort be about battle.”<sup>10</sup> To cite Lynn again: “the essence of military history is combat.”<sup>11</sup> The consensus among many figures in the field is that military history failing to fulfil this basic requirement ceases to be military history and becomes institutional or cultural history.

Since the mid-to-late 1980s traditional and “new” military history have existed side-by-side. Especially when written for popular audiences, the works taking a more traditional approach to the topic continue to be published and well received – although some have taken some pains to adopt some of the methods and concerns characteristic of the “new” approach (more discussion of traditionally ignored topics, less emphasis on narrative, a more holistic treatment going beyond

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<sup>9</sup> John A. Lynn, “The Embattled Future of Academic Military History” in *Journal of Military History* 61, no. 4, (October 1997): 783. This term was coined by an undergraduate class given through the Open University in 1970 and is also the title of Brian Bond’s 1984 book, which is considered to be one of the best on the subject and is used by a number of historians teaching courses on warfare. Brian Bond, *War and Society in Europe* (Suffolk: Fontana, 1984). It is excellent in showing the relationship between the military, warfare and society from the end of the Franco-Prussian war to well into the twentieth century. See also *The Past as Prologue: The Importance of History to the Military*, Williamson Murray and Richard Hart Sinnreich, eds. (Cambridge: Cambridge University Press, 2006); and Peter Paret, *Makers of Modern Strategy, from Machiavelli to the Nuclear Age* (Princeton: Princeton University Press, 1986).

<sup>10</sup> John Keegan, *The Face of Battle* (London: Penguin, 1976), 28.

<sup>11</sup> Lynn, “The Embattled Future,” 784.

purely military matters).<sup>12</sup> One prominent example of a hugely successful work of traditional military history writing is Hew Strachan's lucid and comprehensive *The First World War: Volume I, To Arms*.<sup>13</sup>

Still, among academics, the "new" approach has increasingly come to dominate ongoing research agendas. This thesis can be considered to fall into the "new" historiography in that endeavours to look beyond combat and command in an attempt to answer a variety of questions touching not only on the history of war, but also the larger history of modern Britain modern Europe. At the same time, this thesis by no means neglects the war itself or its combat reality and the command decisions related to it. It is therefore hoped that it satisfies the stipulations put forward by historians like Keegan and Lynn.

#### Aviation History and Technology

As part of the history of culture, exploration, economics, and technology, not to mention the history of warfare, aviation is a subject which has received considerable attention from historians. On the cultural front, numerous works have drawn attention to the role of aviation in shaping twentieth-century concepts of modernity. Recent works include Robert Wohl's book on aviation and the Western imagination, Joseph Corn's and Tom Crouch's examinations of aviation as a part of

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<sup>12</sup> For examples of "new" military history see: Bond, *War and Society in Europe*; Richard Holmes *Tommy: The British Soldier on the Western Front, 1914-1918* (London: Harper Perennial, 2005); Omer Bartov, *The Eastern Front, 1941-45: German Troops and the Barbarisation of Warfare* (New York: St. Martin's Press, 1986); John Dower, *War Without Mercy: Race and Power in the Pacific War* (New York: Pantheon, 1986); Joanna Bourke, *An Intimate History of Killing* (New York: Basic Books, 1999); Gerald F. Linderman, *Embattled Courage: The Experience of Combat in the American Civil War* (London: MacMillan, 1987).

<sup>13</sup> Hew Strachan, *The First World, Volume I: To Arms* (Oxford: Oxford University, 2001). This book is massive (both in length and scope) and is the most detailed account of the war available.

American culture, and Jonathan Vance's treatment of the Canadian case.<sup>14</sup> Authors such as Peter Fritzsche, Michael Paris and Claudio Segré, have discussed air-mindedness and aviation culture in the German, British and Italian cases, respectively, while Scott Palmer and John McCannon examine the topic in Russia.<sup>15</sup>

As for aerial warfare itself, the past ninety years have generated an immense volume of literature on this subject. While much of this consists of popular histories written for aviation buffs and hobby historians, there is no shortage of scholarly work on air warfare. Indeed, to read every book related to what Kennett calls "the first air war" is nearly impossible.<sup>16</sup> This thesis has been guided by John Morrow's aviation section in *Researching World War I*, which provides an overview of historiographic issues relating to the First World War in the air, as well as source lists for each major combatant.<sup>17</sup> Previously mentioned works by Morrow, Paris, Slessor, Kennett, Norris, Raleigh and others have also been important.

Aviation during the inter-war years has received considerable attention from scholars like Matthew Cooper, Barry Powers, Malcolm Smith and David MacIsaac, who have written much about planning, doctrine, and technological developments

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<sup>14</sup> Robert Wohl, *A Passion for Wings: Aviation and the Western Imagination, 1908-1918* (New Haven: Yale University Press, 1997); Robert Wohl, *The Spectacle of Flight: Aviation and the Western Imagination, 1920-1950* (New Haven: Yale University Press, 2005); Joseph Corn, *Winged Gospel: America's Romance with Aviation, 1900-1950* (New York: Oxford University Press, 1987); Tom Crouch, *A Dream of Wings: Americans and the Airplane, 1875-1905* (Washington, DC: Smithsonian, 1989); Jonathan Vance, *High Flight: Aviation and the Canadian Imagination* (Toronto: Penguin, 2002).

<sup>15</sup> Peter Fritzsche, *A Nation of Fliers: German Aviation and the Popular Imagination*. (Cambridge, Mass: Harvard University Press, 1992); Michael Paris, *Winged Warfare: The Literature and Theory of Aerial Warfare in Britain, 1859-1917* (Manchester: Manchester University Press, 1992); Claudio Segré, *Italo Balbo: A Fascist Life* (Berkeley: University of California Press, 1987); Scott Palmer, *Dictatorship of the Air: Aviation Culture and the Fate of Modern Russia* (New York: Cambridge University Press, 2006); John McCannon, *Red Arctic: Polar Exploration and the Myth of the North in the Soviet Union, 1932-1939* (New York: Oxford University Press, 1998).

<sup>16</sup> Kennett, *The First Air War*.

<sup>17</sup> Robin Higham, ed., *Researching World War I* (Wesport, Connecticut: Greenwood Press, 2003).

during the 1920s and 1930s.<sup>18</sup> The Second World War has generated an even greater volume of work on aviation history – the result of the aerial war’s much larger scale and the massive increase in destruction. By this point, of course, the limits of this thesis have been long surpassed.

On a related topic, the airplane is situated squarely at the intersection of military history and the history of technology. More than other wars fought previously, the First World War was what Germans called a *materialschlacht*, or war of the machines.<sup>19</sup> This thesis deals primarily with the newest of these. The importance of technology is reflected in most of the literature – both fictional and historical regarding the First World War.<sup>20</sup> A cultural theme common to many of these works is the claim that between 1914 and 1918, technology usurped humanity as never before and brought about unprecedented destructiveness.

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<sup>18</sup> Matthew Cooper, *The German Air Force, 1933-45: The Anatomy of a Failure* (London: Jane’s, 1981), Barry Powers, *Strategy without Slide-Rule: British Air Strategy, 1919-1945* (London: Croom Helm, 1976), Malcolm Smith, *British Air Strategy Between the Wars* (Oxford: Clarendon Press, 1984), David MacIsaac, *Strategic Bombing in World War II: The Story of the United States Strategic Bombing Survey* (New York: Garland, 1976).

<sup>19</sup> Mary Habeck, “Technology in the First World War, The View from Below,” in eds. Mary Habeck, Geoffrey Parker, and Jay Winter, *The Great War and the Twentieth Century* (New Haven, Conn.: Yale University Press, 2000), 99.

<sup>20</sup> Famous fictional works like Ernst Jünger’s *The Storm of Steel* (London: Chatto and Windus, 1929) and Erich Maria Remarque’s *All Quiet on the Western Front* (London: G.P. Putnam, 1929) place considerable emphasis on technology. Jünger has a particular fascination with technology, evident in his idolization of modern weapons. Even the pacifist Remarque speaks of the omnipresence of technology, especially in scenes where he discusses shelling or the protagonist’s venture into no-man’s land. See also Habeck, “Technology in the First World War,” 110; and Eric Leed, *No Man’s Land: Combat & Identity in World War I* (London: Cambridge University Press, 1979). In *The Pity of War* (New York: Basic Books, 1998) Niall Ferguson frequently addresses the impact of how aircraft, tanks and especially artillery. Also, his consideration of the press hints at some kind of technological change in the media. For a more specific look at technology and the Great War see Daniel R. Beaver, “Industrial Mobilization and Military Technology” in *Researching World War I*, ed. Robin Higham (Wesport, Connecticut: Greenwood Press, 2003). See also Morrow’s *The Great War in the Air*, along with Jay Winter, *Sites of Memory, Sites of Mourning: the Great War in European Cultural History* (Cambridge: Cambridge University Press, 1995); and Paul Fussell, *The Great War and the Making of Modern Memory* (Oxford, Oxford University Press, 1975).

Without denying the weight of such an argument, it should also be noted that the place of technology in military history can be oversimplified. Jeremy Black has warned that a too-narrow focus on technology runs the risk of ignoring the social, cultural, and political origins of that technology, or the human ingenuity and institutional efforts needed to make a technological innovation militarily useful and effective.<sup>21</sup> In the case of the First World War, the aircraft used had to be developed, built, and flown by human beings. Likewise, the aircraft themselves formed only a part of the training of pilots. Instructors, classrooms, military bureaucracy and other important elements went into training pilots. Furthermore, human interaction with technology is of vital importance to this thesis, not simply the technology itself. While, technology is important, human understanding and manipulation of it, is more so.<sup>22</sup> It is with this idea in mind that this thesis will approach technology.

### Other Thematic Issues

Education, in one form or another, is at the heart of this thesis. Therefore, some attention must be paid to British education practices of this period. Schooling was like many other elements of Victorian and Edwardian Britain: it depended largely on social standing.<sup>23</sup> Nevertheless, no matter where pupils received their

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<sup>21</sup> Jeremy Black, *Rethinking Military History* (London: Routledge, 2004), 234. A good example of this would be the Messerschmitt Me 262, a jet fighter made operational by Germany late in World War II. Because of Hitler's insistence on tailoring the Me 262 for use as a bomber, rather than as a fighter to defend against allied bombers, this potentially useful innovation had no effect on the war's outcome.

<sup>22</sup> Aircraft are an excellent example of the importance of human interaction with technology. As will be expanded in the next chapter, a pilot's personal ability was extremely important in determining how the war went for him. See Alan Clark, *Aces High*; Lee Kennett, *The First Air War*; and John Morrow, *The Great War in the Air*.

<sup>23</sup> Geoffrey, Sherington. *English Education, Social Change and War, 1911-20* (Manchester: Manchester University Press, 1981), 1.



instruction, they more than likely had a poor rapport with their instructors.<sup>24</sup> As this thesis will demonstrate, this sort of relationship prevailed in the RFC. While the pressures of war and the novelty of the airplane provided additional stress, much of the pupil-instructor dynamic had its origins in the attitudes toward education and teachers in the period before the outbreak of the Great War.<sup>25</sup> Teachers were often poorly trained and were required to follow a uniform syllabus that allowed for very little personal influence on what they were instructing. As a result, teachers were, as Anne Digby and Peter Searby state, “arid”; they lacked the ability to leave a lasting impression on their students or earn their respect.<sup>26</sup> This trend can be seen in the RFC flying schools, where many pupils entered with a pessimistic attitude toward educators. This attitude would only become worse when the students encountered the RFC instructors in schools that were organized much like the ones of their youth. In regards to teaching and education, a number of precedents were being set in the years before the war.

Furthermore, as social historian Edward Royle points out in his book *Modern Britain: A Social History*, British approaches to education varied considerably compared to those found in Germany, whose educational philosophy was based on

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<sup>24</sup> Anne Digby and Peter Searby, *Children, School and Society in Nineteenth-Century England* (London: MacMillan, 1981), 24.

<sup>25</sup> W. B. Stephens, *Education in Britain, 1750-1914* (London: MacMillan, 1998), 127.

<sup>26</sup> Digby and Searby, *Children, School and Society*, 41. A poor relationship with instructors was not entirely uncommon throughout the British military during the First World War. For examples, please see Siegfried Sassoon, *Memoirs of an Infantry Officer* (London: Faber and Faber, 1930); Robert Graves, *Good-Bye to All That: An Autobiography* (Oxford: Bergham Books, 1995); Wilfred Owen, *Selected Letters*, ed. John Bell, (Oxford: Oxford University Press, 1985); and Graham H. Greenwell, *An Infant in Arms: War Letters of a Company Officer, 1914-1918* (London: Penguin, 1935). Additionally, Holmes’s *Tommy* provides an excellent portrait of soldierly life and training. As does Leonard V. Smith, “Narrative and Identity at the Front: ‘Theory and the Poor Bloody Infantry.’” in eds. Habeck, Parker and Winter *The Great War and the Twentieth Century*.

*Wissenschaft*, or knowledge for knowledge's sake.<sup>27</sup> In Britain, on the contrary, most students received an education that focused on the mechanical and technical elements of their chosen craft. This will be an important point to remember in the following chapters, which attempt to understand British approaches to pilot training and the heavy emphasis initially placed on the technical elements of their instruction at the expense of wartime applications.

One last issue to address is that of masculinity, although this thesis will deal comparatively lightly with this theme. George L. Mosse claims that any study of warfare must address the issue of masculinity because the warrior is the epitome of masculinity. He argues further that the Great War was a uniquely masculine event – seminal in the creation of the modern Western male – and those perceived to be the most masculine of those who fought in the Great War were the pilots who fought above no man's land.<sup>28</sup> Eric Leed adds that pilots were “identifiable rather than anonymous.”<sup>29</sup> Popular perception and media treatment of World War I pilots as heroes clearly brings out the argument that the aviator was that conflict's ideal warrior – and consequently, its ideal male figure. An intriguing question, however, is how and why this ideal came to be framed in past-and-future-oriented terms. Was the World War I pilot a “knight of the air,” a chivalrous warrior detached from the mechanized brutality of the trenches?<sup>30</sup> Or was he the ultra-modern superman, liberated by technology and able to realize individuality as no man before?<sup>31</sup> Mosse

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<sup>27</sup> Edward Royle, *Modern Britain: A Social History, 1750-1985* (London: Edward Arnold, 1987), 394.

<sup>28</sup> George L. Mosse, *The Image of Man: The Creation of Modern Masculinity* (New York: Oxford University Press, 1996), 107.

<sup>29</sup> Leed, *No Man's Land*, 135.

<sup>30</sup> Paris, *Winged Warfare*; and Paul Fussell, *The Great War and Modern Memory* (Oxford: Oxford University Press, 1975), 54; Mosse, *The Image of Man*, 117.

<sup>31</sup> Mosse, *The Image of Man*, 118.

maintains that “the fighter pilot mediated between the individual and the perils of modernity.”<sup>32</sup> Perhaps this thesis, however, will reveal a somewhat more complex reality. RFC rhetoric attempted to instil in pilots a sense that they were individualistic, powerful masters of a new technology – that in the hierarchy of soldiers, they were the elite. The actual sentiments of graduating pilots as they learned how to deal with this new technology tended to be considerably less exalted.

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<sup>32</sup> Ibid.

## The First to Earn Their Wings: The Pre-War RFC Training Programme, 1912-1914

On June 19, 1912, the Central Flying School (CFS) of the new Royal Flying Corps (RFC) was opened. With its opening, Great Britain commenced training military aviators. This chapter will begin by discussing the origins of military aviation and pilot training in Britain, and follow with an examination of the CFS and the conduct of its courses up to the outbreak of the Great War in August 1914. The intention of this chapter is to highlight how dominant aviation doctrine and the relative novelty of the aircraft affected British pilot training in the years before the outbreak of the war. A brief comparison with the pilot training programmes in Germany and France will be included as a point of reference.

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The fascination with flight had been part of Western popular consciousness long before the First World War. At first glance, it is tempting to explain this attraction simply by focusing on the fact that the aircraft, as a fascinating new technology, represented an unprecedented advance for humankind. This was indeed an important cause of British fascination with flight, but not the only one. Further analyses, such as those by historians like Robert Wohl and Michael Paris, reveal that

the late-Victorian and Edwardian interest in aviation had much deeper sociological origins.

The nineteenth century in Britain is considered to have been largely defined by industrialization, the rural and idyllic green Britain of previous centuries being replaced by an industrial land of greys and metallic browns. Many Edwardians and Victorians were displeased with the sweeping industrial changes in Britain and hoped for some kind of return to the past. In his book *Return to Camelot* (1981), Mark Girouard discusses the concept of a return to chivalry and the desire of many Edwardians and Victorians to turn away from industrialization and the values associated with it.<sup>1</sup> Other Britons, with a more forward outlook, felt that technology would prove to be society's salvation in years to come. Paradoxically, the aviator was uniquely able to embody both ideals, the chivalrous and the futuristic.

Aviation was seen by many in pre-1914 Western societies as a source of hope and as a subject of utopian visions; as Robert Wohl states in *Passion for Wings*, it had the potential to provide an arena for new conquests and new places for the wanderings of the human imagination.<sup>2</sup> This utopian zeal was reflected in much of the popular fiction of the late nineteenth and early twentieth centuries. For example, many of Jules Verne's works from the period – such as *Clipper of Clouds* (1886) – proposed that humankind's conquest of the air would unite humanity as nothing

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<sup>1</sup> Mark Girouard, *Return to Camelot: Chivalry and the English Gentleman* (New Haven: Yale University Press, 1981), 293. As Modris Eksteins has stated, "The most significant technological achievement of the modern world was thus also seen as a means of affirming traditional values." Modris Eksteins, *Rites of Spring: The Great War and the Birth of the Modern Age* (Toronto: Lester and Orpen Dennys, 1989), 265.

<sup>2</sup> Wohl, *A Passion for Wings*, 1.

before and create a world where borders and nations did not exist.<sup>3</sup> In Germany, mastery of the air was seen by some, especially socialists, as a step toward ushering in an era of world peace and ending bourgeois and monarchical domination.<sup>4</sup> Certain British writers, such as Percy Collingwood, William Moffat, and George Griffiths, took up similar ideas of futuristic utopia.<sup>5</sup> Claude Grahame-White gave voice to this attitude:

Instead of widely-scattered communities knowing little of each other, and prone in consequence to suspicion and mistrust, humanity will find itself drawn closer and closer together through the speed of aerial transit. Man will forget his nationalist tendencies and see himself as a citizen of the world.<sup>6</sup>

Likewise, in a 1909 article in *The Observer* Charles Turner claimed that the airplane would usher in an era of unending peace.<sup>7</sup> Britain, still the leading imperial power, was not without fictions that connected aircraft and empire. In *With the Night Mail* (1905), Rudyard Kipling depicts a British Empire controlled by technocrats and scientists. Here, technological achievement is a driving force in society, and “air transportation has brought civilization to every corner of the world.”<sup>8</sup> Perhaps even more telling are the words of America’s Wilbur Wright: “We thought we were introducing into the world an invention that would make further wars practically impossible.”<sup>9</sup>

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<sup>3</sup> Michael Paris, “The Rise of the Airmen: The Origins of Air Force Elitism, 1890-1918,” *Journal of Contemporary History* 28 (1) January 1993, 136.

<sup>4</sup> Peter Fritzsche, *A Nation of Fliers*, (Cambridge, Mass.: Harvard University Press, 1992), 32.

<sup>5</sup> Paris, “The Rise of the Airmen,” 128.

<sup>6</sup> *Ibid.*

<sup>7</sup> *Ibid.*

<sup>8</sup> *Ibid.*, 127.

<sup>9</sup> Wilbur Wright cited in Paris, “The Rise of the Airmen,” 132. Wright’s comments are disingenuous, if not self-righteous. The Wright brothers had been marketing their invention to militaries on both sides of the Atlantic, most notably the French and the American armies. Perhaps he believed that the airplane would deter nations from going to war; perhaps his view was more utopian.

By contrast, dystopian visions of aviation were just as prevalent in the years leading up to the First World War. As Robert Wohl points out, many of these more pessimistic thinkers followed Nietzsche's thinking in *Also sprach Zarathustra* (1888): "And if man were to learn to fly – woe, to what heights would his rapaciousness fly?"<sup>10</sup> British popular fiction in the pre-First World War period was marked with numerous dystopian and apocalyptic works that prominently featured aviation. H. G. Wells's *The War in the Air* (1909) features an armada of German Zeppelins that destroys the United States Navy en route to their eventual destruction of New York City.<sup>11</sup> In the same vein was Andrew Gray's *The World at War*, in which a massive Japanese aerial armada attacks the United Kingdom. These are simply two examples of a literary culture that was littered with death-from-above stories.<sup>12</sup> Whether dystopian or utopian, such fictions reflected society's dreams and nightmares about what the future might hold.

The public's fascination with real-life aviation ran just as high as its appetite for aviation in fiction. The civilian population noted with interest various aerial spectacles such as air races and other events, both in the United Kingdom and on the continent, especially in France.<sup>13</sup> After flying with Wilbur Wright in 1909, an unnamed news correspondent wrote: "I have learnt what it feels like to be a bird. I

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<sup>10</sup> Wohl, *A Passion for Wings*, 3.

<sup>11</sup> Michael Paris argues that Wells's book is neither the first nor the most original of this genre. However, it is the most well known. Also, these aerial dystopian stories were only one part of a growing genre in Great Britain in the last two decades before the outbreak of the Great War. British popular culture and literature alike were filled with dozens, if not hundreds of yarns of impending destruction and German invasion. Niall Ferguson in *The Pity of War* highlights the depth and breadth of the pre-war apocalyptic genre. The similarities between these works and British and American fiction focused on the Soviet Union during the Cold War are striking. See Ferguson *The Pity of War*, 1-5. More directly related to aviation, Paris's *Winged Warfare* devotes fifty pages to fictional depictions of the place of air power in future wars.

<sup>12</sup> Wohl, *A Passion for Wings*, 3.

<sup>13</sup> Up to the start of the Great War France was the world leader in aviation by nearly every measure – technical achievement and flight records.

have flown. Yes, I have flown. I am still astonished at it, still deeply moved.”<sup>14</sup> Also in 1909, Louis Blériot beat Englishman Hubert Latham across the English Channel to win a 1,000-pound prize, established by the *Daily Mail*, as a reward for the first person to accomplish the feat. After the contest Blériot was mobbed by revellers in Dover, and Lord Northcillife, a prominent English newspaper owner, labelled the accomplishment one of the great news stories of the twentieth century.<sup>15</sup> In addition to Blériot’s channel crossing, a multitude of air races, contests and aeronautical displays took place throughout Britain, receiving much fanfare and attracting large live audiences. This attention, as will be shown, aided in the creation of the Royal Flying Corps in 1912, as people in Britain began to feel that the English Channel was no longer the impenetrable defence it once had been.

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Preparation for war in the air quickly became part of an already escalating arms race as the nineteenth century gave way to the twentieth. However, in contrast to its pre-eminence on the seas, Great Britain was losing the race for dominance in the skies, and losing it badly. The nations of continental Europe were noticeably farther ahead of Britain in aviation development and training. France was the undisputed leader in aviation, largely a result of its strength in aircraft-engine manufacturing and government involvement in all aspects of aircraft production.<sup>16</sup> In fact, when Britain finally established its own flying school it was compelled to use French aircraft.<sup>17</sup>

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<sup>14</sup> Wohl, *A Passion for Wings*, 94.

<sup>15</sup> *Ibid.*, 58-59.

<sup>16</sup> Morrow, *German Air Power in World War I* (Lincoln: University of Nebraska Press, 1982), 11.

<sup>17</sup> Norris, *The Royal Flying Corps*, 102.



France established its military air arm in 1910 along with a supplementary pilot training programme.<sup>18</sup> The French pilot training programme was entirely the responsibility of the army; pilots were seen and treated as soldiers, giving an air of professionalism that sometimes was lacking in British flight schools.<sup>19</sup> The majority of French pilots at this time were mostly trained at Le Bourget – and in airplanes, rather than lighter-than-air craft such as airships.<sup>20</sup> As the war went on, however, France’s training centres would grow to be quite impressive. Eventually they would be arranged in a satellite system. In the centre was a large school in the shape of a triangle, with the airfield forming the outer edges and the buildings located in the centre. This school was used for pilot classes, housing, repair shops and other logistical operations. Pilots, when not attending classes, would set out from the larger field in the morning for one of the smaller fields in close proximity and use it for in-flight training. The size of French schools was remarkable, to the point that throughout France there were only five pilot training hubs, compared to forty-four in the United Kingdom alone. Each school had a complement of nearly 400 aircraft (133 in the air, 133 in reserve, and another 133 under maintenance), each with two pupils assigned to them. Supporting the operation of the aircraft were 750 mechanics, 455 labourers and 150 women.<sup>21</sup>

At the same time, Germany was revamping its military air units. Slowly beginning to give greater weight to the airplane, as opposed to the airship, Germany

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<sup>18</sup> Morrow, *The Great War in the Air*, 11.

<sup>19</sup> Claude W. Sykes, *French War Birds* (Vista, CA: Aeolus, 1987), 12.

<sup>20</sup> *Ibid.*, 13. It was hoped that more information could be found on French pilot training, but research in this area was very difficult.

<sup>21</sup> PRO Air 20/598, “French Flying Schools: Report by Lt. Col. Smith-Barry, 1918.” Smith-Barry reports on the effectiveness of the organization of the French schools, then abruptly dismisses French training methods as inferior.

was reaching similar conclusions to those in France regarding the application of the airplane in battle – both countries felt it had the potential to be an outstanding reconnaissance platform. Furthermore, by 1912, the German aviation industry was second only to France in airframe and air-engine manufacturing.<sup>22</sup> As in France, the German government was also more involved in the aviation industry than in Britain. In addition to a burgeoning aviation industry Germany also had an established military pilot training programme that integrated military training and participating aviation production firms with fully functioning, private pilot training schools. For example, firms such as Aviatik, DFW, Fokker and Gotha set up pilot training programmes attended by their own employees. After being trained by their firms the pilots would be entered into the *Freiwilligen Fliegerkorps* (Free Air corps), which would then act as the pilot pool for the *Luftstreitkräfte* (German Air Force) in the event of war.<sup>23</sup> This cooperation between private firms and the military would be the standard German training method throughout the war.

Entry into the *Luftstreitkräfte* was all-volunteer and quite competitive. Potential pilots, mostly drawn from the army, had to undergo a strict physical and medical review before being allowed to enter the service.<sup>24</sup> Not surprisingly, the majority were young officers of Prussian or Bavarian background. However, as the war went on these regulations became more and more lax, as they did in Great Britain.<sup>25</sup>

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<sup>22</sup> Morrow, *The Great War in the Air*, 49.

<sup>23</sup> Bundesarchiv (Abteilung MA) PH 9 V/179, “Satzung: des Deutschen Freiwilligen Fliegerkorps.”

<sup>24</sup> Bundesarchiv (Abteilung MA) PH 21/80, “Anleitung zur Ausbildung von Waffenmeister Storgenhilfen für die Fliegertruppen.”

<sup>25</sup> PRO Air 1/611/16/15/284, “Training of German Aviation Personnel, Air Ministry, September 3, 1918.” Despite the German focus on a potential pilot’s ability to ride, the vast majority of trainees who entered pilot training came from the infantry, not the cavalry.

The course of instruction at the German schools at this time was very similar to that found in Britain in the pre-war years; in both countries there was a distinct lack of training with direct combat application. In Germany, the private firms responsible for the training of pilots did not seem to take an interest in training their pupils as soldiers, since they were employees of a company, not members of the armed forces.<sup>26</sup> What military training there was in Germany varied little from that in Great Britain. Like their British counterparts, most German military commanders did not yet see the aircraft as a weapon capable of carrying the war to the enemy on its own.<sup>27</sup> Before the war, the German General Staff stated quite plainly that “the duty of the aviator is to see, not fight.”<sup>28</sup> As a result, the majority of German pilot training focussed more on the probable application of the aircraft in the event of war – artillery observation – and less on the structure and mechanical operations of the aircraft.<sup>29</sup> There was, as was the case in Britain and France, little discussion of the aircraft as an offensive weapon. What most distinguished Germany from Britain before the war was the scale of its air force: 450 aircraft to Britain’s 160.<sup>30</sup>

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Clearly, by 1912 Britain lagged behind its continental neighbours where aviation was concerned. This failing did not go without criticism. Just as the British public and media were captivated by aviation in the years before the war, they were

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<sup>26</sup> Ibid.

<sup>27</sup> Morrow, *German Air Power in World War I*, 5.

<sup>28</sup> Alan Clark, *Aces High*, 16.

<sup>29</sup> Bundesarchiv (Abteilung MA) PH 21/85, “Werdegang der Fliegerschule,” 1. As highlighted later in this chapter, these courses of instruction were very similar to what was being taught in British flying schools before and in the early years of the war. One must also keep in mind that German military aviation was still more focused on dirigibles and their applications than on airplanes.

<sup>30</sup> Morrow, *German Air Power*, 11. Also, before August 1914, the British aviation industry was only capable of producing approximately 100 aircraft annually. This figure placed Britain three years behind Germany in aviation development at the start of the war.

aware of Britain's relative lack of preparation for an air war. For instance, Wells openly questioned British defence policy regarding all modern weapons, including airplanes, airships and submarines.<sup>31</sup> This is not to say, however, that the War Office was ignorant of the growing importance of military aviation. The Royal Navy had been training officers in the military applications of the dirigible and other lighter-than-air craft since 1909.<sup>32</sup> However, the Navy focussed tightly on airships, not airplanes.<sup>33</sup> The Air Battalion of Royal Engineers, a branch of the British Army, operated an aviation training centre at Farnborough (still a major RAF base). This battalion was responsible for two sub-sections of aviation training, one devoted to lighter-than-air (airships and balloons) flight, the other to heavier-than-air (airplanes).<sup>34</sup> However, the scale of these programmes was so minute that they are hardly worth mentioning. In fact, only four pilots graduated from these courses in 1911.<sup>35</sup>

Criticism of Britain's outdated and unimaginative military policies gathered steam by 1911.<sup>36</sup> In November, Prime Minister Herbert Asquith ordered the War Office and Committee of Imperial Defence (CID) to conduct investigations into the status of military aviation in Britain. These inquiries confirmed what a 1911 Royal

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<sup>31</sup> Morrow, *The Great War in the Air*, 40.

<sup>32</sup> Norris, *The Royal Flying Corps*, 21.

<sup>33</sup> PRO Air 1/683/21/13/2334 "Aeronautics Course for Officers, November 1912." This focus on the dirigible instead of the airplane is quite understandable. Airplanes at this time had a very short range, making them effectively useless for any kind of long-range naval operations. The dirigible, on the contrary, had the range needed for naval reconnaissance. It was not until the Second World War, with the development of airplanes such as the PBY Catalina and the FW Condor that airplanes could act as an effective "eye in the sky" or seriously threaten enemy vessels.

<sup>34</sup> PRO Air 1/29/60, "Operations Record Book, Central Flying School, 1912-1942."

<sup>35</sup> Ibid.

<sup>36</sup> Morrow, *The Great War in the Air*, 40.

Army report had stated: “the aircraft will undoubtedly be used in the next war.”<sup>37</sup> To this end, the technical sub-committee of the CID, which was formed to respond to Asquith’s enquiries, recommended the establishment of independent naval and military air arms – the Royal Naval Air Service (RNAS) and Royal Flying Corps (RFC) respectively – along with the establishment of the Central Flying School (CFS).<sup>38</sup> These recommendations were approved by Asquith and Parliament in April 1912. Pursuant to these recommendations the RFC was constituted on May 13, 1912, and the CFS on June 19, 1912.

The goals of the CFS were clearly outlined from its establishment: “not to produce aviators as such, but professional war pilots.”<sup>39</sup> The 1912 concept of the military pilot was a very different one from that of today. For example, the 1913 Royal Flying Corps training manual states that “the most important role of the aircraft in war is reconnaissance.”<sup>40</sup> During the RFC’s infancy the aircraft was not seen as an asset that, on its own, could bring the war to the enemy.<sup>41</sup> It was thought that to be effective, the aircraft had to work in support of other elements of the military (most commonly the artillery) by locating the enemy and directing fire or

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<sup>37</sup> PRO Air 1/683/21/3/2234, “Study of Aircraft and Training of Personnel, 1910-1911.” The CFS was responsible for training only RFC pilots. Until their merger in April 1918 the RFC and RNAS were two entirely separate entities, the RFC being the air arm of the Royal Army and the RNAS being that of the Royal Navy.

<sup>38</sup> The term “military” was used before and during the First World War to describe elements of the British armed forces that did not comprise the Royal Navy. It will also be used in this thesis from time to time to refer to the British Army and the Royal Flying Corps simultaneously.

<sup>39</sup> PRO Air 1/29/60, “Operations Record Book, Central Flying School, 1912-1942.”

<sup>40</sup> PRO Air 1/785/204/4/558, “Training Manual, Royal Flying Corps, Part II (Military Wing), 1913 (Manuscript),” 10.

<sup>41</sup> PRO Air 1/683/21/2234, “Memorandum on the Training of Aeroplane Personnel Prepared by Captains H. J. M. Brooke-Paplan and C. J. Burke, Air Battalion, 1912.” This attitude was not found only in this particular memorandum, but also in RFC Training Manual of 1914 (Air 10/79), course syllabi, and personal diaries and reminiscences of numerous pilots and officers.

helping to direct troop positioning. This secondary role would help define the RFC and its pilot training until at least the Battle of the Somme, if not later.<sup>42</sup>

For the location of the CFS a 2,400-acre piece of land near the town of Upavon on Salisbury Plain was purchased from various proprietors. Although the War Office considered a few different locations, the Upavon site was chosen for its proximity to London, the presence of railheads and roads, the relatively dry climate (by English standards), and the open and generally isolated terrain. Numerous buildings were constructed on this land to house the CFS: officers' and trainees' messes and quarters, pilot barracks, workshops, classrooms, and hangars. When the school first opened, much of the construction was not yet complete; many of the classes had to be taught in tents, and the repair work on the aircraft was done out in the open or in temporary shacks. These buildings were arranged around a large L-shaped grass field (this arrangement greatly resembled designs used in Germany) which would be used for both operating and parking the aircraft.<sup>43</sup> Thanks to poor design, the airstrips were of a considerably higher elevation than the surrounding terrain and the rest of the school, which exposed the runways to the full brunt of the wind in the area – hence the nickname Siberia.<sup>44</sup>

The school's original staff was as sparse as its facilities. Only twelve officers were employed at the school when the first course began in August 1912. These included the secretary, the theory and construction instructor, the meteorology instructor, the engine instructor, five flying instructors, the medical officer, the

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<sup>42</sup> This is reflected in the syllabi of the CFS. These course outlines will be examined later in this chapter.

<sup>43</sup> Bundesarchiv (Abteilung MA) PH 19/18, "Führer durch die Flieger Feldstellung."

<sup>44</sup> PRO Air 1/2310/17, "Extracts from a Digest of Services of the CFS, Upavon."

quartermaster, and the commandant, Godfrey Paine, a naval officer who himself did not know how to fly. He had been hand-picked by First Lord of the Admiralty Sir Winston Churchill, who informed Paine that he was going to be heading the school by telling him that he “had better learn to fly.”<sup>45</sup> Despite his inability to pilot an aircraft, Paine was actually a logical choice to head the CFS; he was familiar with the particulars of military aviation, and was the former commandant of the Naval Flying School at Eastchurch.<sup>46</sup> Joining the twelve officers were fifty-four enlisted men and non-commissioned officers, mostly warrant and petty officers (technical instructors), and twenty civilians (labourers and mechanics).<sup>47</sup>

Similarly, the school’s complement of airplanes was small and anything but state-of-the-art. As mentioned earlier, the British aviation industry was not in a position to provide aircraft for the school in 1912. As a result, the CFS used eight French Henri and Maurice Farman aircraft equipped with Gnome and Renault engines.<sup>48</sup> This deficit would be remedied after the first CFS course. By the beginning of the second course British aircraft were beginning to trickle into the school. Even so, the new British airframes were built around the French Renault or Gnome engines.

The first course of instruction at the Central Flying School began on August 17, 1912. In contrast to the difficulties involved in establishing the school, it was no problem at all finding men to fill the cockpits of the CFS’s training aircraft. A list of the pupils of the first training course at the CFS reads like a who’s who of future

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<sup>45</sup> Norris, *The Royal Flying Corps*, 26.

<sup>46</sup> *Ibid.* 26.

<sup>47</sup> PRO Air 1/513/16/3/77, “Special Army Order from the War Office, April 15, 1912.”

<sup>48</sup> Both the Henri and Maurice Farman aircraft were biplanes. Monoplanes had been banned by the CFS as they were seen to be dangerous – too fast and extremely difficult to control at low speeds.

RFC and RAF leaders in both world wars: Hugh Trenchard, who became leader of the RFC in the field during the First World War; J. M. Salmond, who later became chief of the air staff and a knight; and Robert Smith-Barry, the man who revolutionized British pilot training later in the war (and who will later appear as a central figure in this thesis).<sup>49</sup> With these three were eleven other would-be pilots from the army (who formed the majority), navy, and civilian life.<sup>50</sup> These men were housed off-site in local inns, as their barracks and mess halls were not yet completed. Nevertheless, they did not seem to mind their accommodations; their memoirs contain numerous references to enjoying life in the local pubs and taverns when they were not in the classroom, workshop, or the air.

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The typical man entering pilot training was urban middle or upper-middle-class.<sup>51</sup> There are a number of possible explanations for the more urban composition of the RFC. There may well have been a close connection between the modern cities of industrialized Edwardian Britain and one of the period's newest technologies: the aircraft. City dwellers were more probably familiar with machinery and other technical apparatus, likely making them more proficient in understanding and using aircraft. The generally more conservative gentry, like many of the Army's generals, may have had a more difficult time coming to terms with the applications of the new technology. Conversely, many officers within the

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<sup>49</sup> PRO Air 1/683/13/2234, "Officers Under Instruction at the CFS, First Course, 1912"

<sup>50</sup> The numbers for the first course were as follows: 5 from the Royal Navy and 10 from the Army; second course is unknown; third course: 6 from the Royal Navy, 2 Royal Marines, 3 Royal Navy Reserve, 16 Army, 5 Army Reserve, 5 Indian Officers; fourth course: 10 from the Royal Navy, 20 Army. PRO Air 1/2310/17, "Extracts from a Digest of Services of the CFS, Upavon, December 1912"

<sup>51</sup> Lee Kennett, *The First Air War*, 118.



RFC associated flying with sport horsemanship.<sup>52</sup> Many people before the war likened a pilot to an equestrian and his aircraft to his steed. As a result of this disproportionate representation, pilots were often referred to as the “gentlemanly flier.”<sup>53</sup>

The prospective pilot would have more than likely received some form of higher education, beginning with a state school at the least, or in some cases one of the great academies like Eton or Rugby.<sup>54</sup> Upon completing his secondary education, the typical RFC recruit had probably attended university, in the wealthiest instances, Oxford or Cambridge. During his time in school he would have almost certainly been exposed to literary works such as *Tom Brown’s School Days*, the diaries of the tragic hero Robert Scott, and novels by H. G. Wells and Jules Verne.<sup>55</sup> All these would have instilled in the recruit a typical Victorian understanding of masculinity, muscular Christianity and heroism, not to mention a youthful sense of adventure. In his boyhood a soon-to-be RFC pilot likely took in air races or read about the feats of men like Blériot, Farman and Latham in newspapers or aviation magazines such as *Flight*.

What became evident in the young pilot-to-be was a combination of old notions of masculinity and chivalry (those found in the adventures of Lord Nelson or the tales of King Arthur) and a new modern masculinity, defined by the sort of individuality, release and adventure associated with the airplane.<sup>56</sup> A large number

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<sup>52</sup> Michael Paris, *Winged Warfare*, 217.

<sup>53</sup> Kennett, *The First Air War*, 118.

<sup>54</sup> W. B. Stephens, *Education in Britain*, 127.

<sup>55</sup> George Orwell, “Boys Weeklies,” *The Personal Essays of George Orwell* (London: Penguin, 1994), 78-100.

<sup>56</sup> An affinity for gadgetry and technology also cannot be underestimated. However, the freedom and individuality associated with flight in this time appears to be more important. For example, the tank

of pilots would have turned to this uniquely modern technology as a way of recapturing a sense of chivalry and adventure in a Britain that many felt had lost the virtues of the past as a result of sweeping industrial changes. As T. E. Lawrence famously remarked, flying was the only “first-class thing” his generation had to do.<sup>57</sup> Similarly, Edwardian society drew strong connections between combat and sport, with equestrianism a dominant metaphor, as mentioned before.<sup>58</sup> In few cases was this link stronger than in the air, where pilots who viewed themselves as staunch individualists, but part of a larger team.

In the early years of the war, the RFC inadvertently cultivated these thoughts in its trainee pilots. Training in the RFC was vastly different than that in other services, which emphasized repetition, co-operation and teamwork, and consciously suppressed individuality in an effort to form cohesive fighting units.<sup>59</sup> Those officers who had already undergone training in one of the other branches were quick to notice the difference in the approach to training. For example, Flight Lieutenant E. M. Pollard labelled training in the RFC as “infinitely easier” compared to training in the army.<sup>60</sup> There were a number of reasons for this ease. Cadets and trainees were treated, or so it seems, much better than their counterparts in the Army or Navy. They had better food to eat, such as meals that were always hot and a decent mess to

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did not fascinate people the way the airplane did. Quite the contrary, during the First World War, tanks were largely seen as moving steel coffins and technology that trapped man, not released him.

<sup>57</sup> Cited in Wohl, *A Passion for Wings*, 1.

<sup>58</sup> Michael Paris, *Winged Warfare*, 217.

<sup>59</sup> William H. McNeill, *Keeping Together in Time: Dance and Drill in Human History* (Cambridge: Cambridge University Press, 1997).

<sup>60</sup> PRO Air 1/2387/228/11/57 “The War Experiences of E. M. Pollard.” It should be noted at this point that in most documents found in the PRO Air series, whether they be letters or other reports generally do not provide full given names. The full given name is used when known.

enjoy them in.<sup>61</sup> Perhaps even more important than these small perquisites was the considerable difference in the nature of what they were being taught at the schools. Or, as Flt. Lt. Pollard put it, the pilots had “more interesting work” to do.<sup>62</sup>

This last point raises another somewhat simple but rather important contrast between infantry and naval training and training in the RFC – the nature of flying and fighting in the air, as opposed to fighting on land or at sea. Squadron Leader (during the war, Flt. Lt.) Sir N. Leslie points out quite astutely the difference between the infantry and the RFC:

Very different were the conditions at the CFS. There individualism was the outstanding feature and wide field offered for the display of initiative, while the rapid development of the art of flying naturally demanded the ready acceptance of new ideas and changing conditions.<sup>63</sup>

Leslie touches on an issue that is vital to understanding British pilot training during the Great War: the warrior as an individual was to be promoted and encouraged, not stifled. Additionally, flying, long before the war, appealed to Britons precisely because of its connotations of individuality and superiority. The RFC had no need to hammer this attitude into the heads of its pupils. Prospective pilots were already predisposed to take it to heart.

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<sup>61</sup> Ibid. and IWM 88/7/2, “Diary of H. C. Holman, RAF,” and IWM 88/7/1, “The Diary of Second Lieutenant H. G. Downing.” However, the mess halls actually turned into a serious source of poor morale and distrust between the pupils and instructors. This issue will be explored in detail shortly.

<sup>62</sup> PRO Air 1/2387/228/11/57 “The War Experiences of E.M. Pollard.” See also PRO Air 1/2387/228/11/48, “The War Experiences of Wing Commander T. W. M. Morgan, September 1924” along with PRO Air 1/2387/228/11/43, “The War Experiences of Flt. Lt. L. N. Hollinghurst, September 10, 1924,” as well as numerous other reminiscences in the PRO Air 1/2387/228/11 series.

<sup>63</sup> PRO Air 1/2387/228/11/36, “The War Experiences of Squadron Leader Sir N. Leslie, September 24, 1923.”

For purposes of classroom, practical and in-flight instruction, CFS pupils were divided into four flights. Flight A contained military, naval and civilian men who were not yet pilots and would form part of the “special reserve.” Flight B was, for all intents and purposes, a more experienced version of Flight A; these men were pilots not yet fully trained but seen to have more potential. The largest of the four flights, Flight C, included officers who already had pilot training and were attending the school to become military aviators.<sup>64</sup> Lastly, officers who were already pilots in the RFC and attending the school on a refresher course would be placed in Flight D. Each of the different flights received different training depending on its members’ specific needs. For example, those in A and B flights began with the most elementary training and spent considerably more time learning the nuances of flying – basic aerial manoeuvres, internal-combustion engine and airframe work and so on. Those in C and D flights typically skipped the basic flight instruction and quickly moved to more advanced manoeuvres in the aircraft, practical instruction on its construction and components, and wartime applications of the aircraft in war (at this time, artillery direction and reconnaissance).<sup>65</sup>

The in-class and practical instruction of pupils at the CFS was thorough and diverse. Above all, the pupils were expected to understand exactly how their aircraft worked. To this end, they exhaustively studied the engine, the materials and components used to construct and operate it, and the physical laws that governed the aircraft in flight.

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<sup>64</sup> PRO Air 29/64, “Operations Record Book, Central Flying School, 1914-1922.”

<sup>65</sup> PRO Air 1/513/16/3/77, “Central Flying School, Syllabus of Instruction, August 1913.”

In the early 1910s the internal-combustion engine was still a fairly new technology. The pilots attended nine lectures as part of their training in the particulars of the Renault and Gnome internal-combustion engines and were expected to comprehend everything about how the engine worked: how fuel was converted to energy, how the engine was cooled and lubricated, what affected the efficiency of the engine, and trouble-shooting methods if it were to fail in flight.<sup>66</sup> These in-class discussions of the engine were supplemented by extended spent hours working on the engines in the machine shops: mounting and dismounting the engine, assembling and disassembling components and the engine itself, and working with a number of machine tools. After in-class and practical training with the internal-combustion engine, pilots underwent a series of exams testing their knowledge of the engines. These exams consisted of ten questions, such as “Describe the lubrication system in the Gnome engine.” Pilots in the pre-war courses did quite well on these exams.<sup>67</sup> Nonetheless, of the six pilots who scored highest in the course ending in September 1914 only one would survive the war.<sup>68</sup> Considering the generally high attrition rate among pilots during the First World War, one should not over interpret this fact. However it does show that technical proficiency by itself did not guarantee combat success, and it may be considered to speak at least somewhat to an overemphasis on technical matters in the RFC training programme.

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<sup>66</sup> The engines, like the airframes being used by the RFC in the pre-war years, were almost exclusively French in design and fabrication. This lack of British equipment proved a serious hindrance to the development of the RFC and its training programme. Geoffrey Norris provides an excellent description of the state of the British aerospace industry in chapter two of *The Royal Flying Corps*.

<sup>67</sup> PRO Air 1/1135/204/5/2224, “Results of the Oral Examination of Officers under Instruction at the CFS, September 30, 1914.” All pupils scored above fifty per cent and many scored into the nineties.

<sup>68</sup> Commonwealth War Graves Commission, <http://www.cwgc.org/cwgcinternet/search.aspx>, accessed October 13, 2005.

Nonetheless, given the primitive and fragile nature of military airplanes at the time, it is understandable that the pre-war training programme did not place great emphasis on aerial manoeuvring.

To complement their instruction on the engine, the pupils attended nine lectures on instrumentation and aircraft construction. They were required to understand and operate all the instruments found in the aircraft: air speed indicator, tachometer (measures engine RPMs), oil gauges, and altimeter (measures altitude). For example, the Royal Flying Corps training manual of 1914 spends two full pages discussing exactly how an altimeter works.<sup>69</sup> As with instrument instruction, one of the goals of the training programme was to ensure that the pupils understood the construction of the aircraft. In the classroom they received nine lectures on the flight surfaces of the aircraft operated: the ailerons, elevators, rudders, how the wings were constructed and mounted to the fuselage, and what materials were used in different parts of the aircraft (in most cases a wooden frame with cloth skin).<sup>70</sup> As their report cards reflect, the vast majority of pilots had little or no difficulty with these technical aspects of their training. This is likely the result of both the intensive and simplistic nature of this instruction. The examinations given to pilots in these subjects required considerable memorization of lecture notes and training manuals as opposed to problem-solving skills. For example, exam questions might have read as follows: “How do you fix air bubbles in your compass?”<sup>71</sup>

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<sup>69</sup> PRO Air 10/79, “Training Manual, Royal Flying Corps, 1914, General Staff, War Office,” 69-103.

<sup>70</sup> PRO Air 10/79, “Training Manual, Royal Flying Corps, 1914, General Staff, War Office,” 17-42. It is impossible to do justice to the amount of attention given to the “technical” aspects of flying in the Training Manual. Over 100 pages of the manual are devoted to the mechanical aspects and operation of the aircraft, while fewer than fifty discuss flying, navigation and operations.

<sup>71</sup> PRO Air 1/785/804/4/558, “May 1915, Officers’ Test Examinations at the Central Flying School; Time Allotted: 3 Hours.”

Some of the instruction, however, contained elements even less directly relevant to combat or even piloting the aircraft. One such example was training in the theory of flight, a potpourri of subjects pertaining to aeronautical physics and occupying nine of the sixty-two lectures pupils attended. These lessons included intensive instruction in velocity, pressure, lift, drag, and thrust. Pilots were given basic problems and mathematical equations involving these aeronautical principles – being required, for example, to determine how much lift was generated by a certain type of wing at a given speed, or how much thrust would be required to keep a plane of a particular weight in the air.<sup>72</sup> Along with the theory of flight the pupils were trained in meteorology, a subject with more direct applications to flying. Meteorological training included seven lectures in weather forecasting and the use of instruments such as the barometer and thermometer. More specifically, pilots were trained in meteorology as it applied to aviation. Although pilots would rarely venture above 10,000 feet before the middle of the war, they were expected to know the change in temperature and air pressure as they ascended and what impact this change had on their aircraft and its components. The bulk of pilot training in meteorology was related to wind. Quite naturally, pilots were required to understand the atmospheric laws that governed the wind – how it changed and what wind strengths could be expected in certain weather conditions and over different terrain.<sup>73</sup>

The pupil's entire schedule included only fourteen lectures related to what was seen at this stage of the war as the airplane's primary combat applications: aerial

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<sup>72</sup> PRO Air 1/2310/17, "Extracts from a Digest of Services of the CFS, Upavon."

<sup>73</sup> PRO Air 1/513/16/3/77, "Central Flying School, Syllabus of Instruction, August 1913."

reconnaissance and artillery direction.<sup>74</sup> In these classes students were first taught how to understand maps and navigate their aircraft. Included here was training in route selection, compass usage, aircraft drift, and the identification of landmarks such as hills, forests, roads, railways, railheads, towns and individual buildings from the air. The pilot was expected to be able to combine all these skills and navigate his aircraft from memory. Furthermore, he was expected to be able to leave his airfield, and navigate a predetermined course again by memory. This particular skill was called cross-country flying and pilots were tested on their ability to conduct cross-country flights effectively at different altitudes. Report cards from the pre-war CFS courses indicate that this was a skill that most learned with ease; most received a very good rating.<sup>75</sup> Pilots were also taught how to spot and estimate the strength of various types of enemy units, whether they were marching or dug in. Additionally, they were expected to be able to identify numerous types of warships and report on warship formations.<sup>76</sup> As the war approached, and as the CFS grew, training in reconnaissance and artillery direction became more and more important until it was the largest single aspect of any pilot's training. Even though most pilots still flew with an observer whose responsibility it was to carry out these tasks, not until 1917 was observation finally surpassed by air-combat tactics as the largest portion of pilot training. This is not to say, however, that pilot training before the war totally ignored any discussion of enemy aircraft. Above all, pilots were instructed to avoid

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<sup>74</sup> PRO Air 1/2310/17, "Extracts from a Digest of Services of the CFS, Upavon."

<sup>75</sup> PRO Air 1/1135/204/5/2224, "Letter From Officer Commanding RFC Squadron 1, to Adjutant Officer Commanding Administrative Wing, RFC."

<sup>76</sup> PRO Air 1/803/204/4/1139, "Netheravon Camp – June 1914 – List of Lectures to be Delivered by Officers."



combat with enemy aircraft, but it was considered suitable to carry rifles or pistols to deal with any encounters.<sup>77</sup>

Naturally, no pilot training course would be complete without considerable time being allocated to in-flight instruction. In the early days of the Central Flying School, allocating time to in-flight training was much easier than conducting it. In many cases, there were not enough aircraft to train even the small number of pilots at the school. As a result, a good number of pilots spent many hours simply sitting on the field, waiting for their opportunity to fly.<sup>78</sup> When they did get into the air with an instructor, the system used to train them was rather unscientific. In some cases, there was no seat for the second person in the aircraft, and the pupil or instructor, depending on who was flying, was required to hang on to one of the wing spars. On the first training flights, the instructor flew the aircraft while the pupil observed his inputs to the controls and how the aircraft responded to them. When the instructor felt the pupil was sufficiently familiar with the controls of the aircraft he would allow the pupil to control the plane himself. In many cases, however, instructors did not feel sufficiently comfortable to give their pupils control of the aircraft. As a result, out of concern for their safety, instructors often did most of the flying. This practice would become a serious problem as the war went on and pupils failed to receive adequate in-flight experience. The time required to reach this level of proficiency depended much on the flight which the pilot had been assigned.

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<sup>77</sup> This course of instruction remained essentially unchanged, with the exception of the odd additional lecture, and the slow shift from technical to observation lectures, until the late years of the war. The following chapters will return to this point, which illustrates the relative infancy of military aviation – an infancy that kept aircraft at much lower technological levels than one might expect before and during the war.

<sup>78</sup> J. M. Salmond cited in Tredrey, *Pioneer Pilot*, 17.

Those in C or D flight required little or no time before they were permitted to operate the aircraft; those in A or B flight might wait weeks before actually being given the controls.<sup>79</sup> Once in control of the aircraft, the pupil would conduct a series of manoeuvres known as straights, landings and then circuits.<sup>80</sup>

After a pupil had what the instructor believed to be sufficient time controlling the aircraft under supervision, he was permitted to take the aircraft up for solo flights. A trainee did not have free time to gallivant while he was flying solo: he had to fulfill a particular set of tasks in order to complete his training. Generally, each solo flight lasted between one and two hours. Pilots were required to take off and land under various parameters – such as a shortened landing field – or if ordered, to conduct a forced landing on any terrain. They were also required to conduct flights with a passenger (or weights) to simulate carrying an observer. Additionally, pupils were expected to be able to shut off the aircraft's engine at 2,500 feet and land safely. As mentioned earlier, they had to be able to navigate the aircraft cross-country over a distance of 100 miles. More advanced manoeuvres – rapid climbs, loops, climbing and descending turns – had to be made while the pilot was monitored from the ground. These manoeuvres were selected for particular reasons, as they forced the pilot to utilise all of the control surfaces in tandem; most commonly, if a trainee made a mistake, it was during these more complicated actions.<sup>81</sup> Despite this, and surprisingly enough, there were very few accidents at the CFS in its first few years of operation. In the first course, there were only two minor

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<sup>79</sup> PRO Air 1/513/16/3/77, "Central Flying School, Syllabus of Instruction, August 1913."

<sup>80</sup> PRO Air 29/64, "Operations Record Book, Central Flying School, 1914-1922."

<sup>81</sup> PRO Air 1/683/21/13/2234, "Military Aviation Course April-August 1912, Course Outline (Syllabus)."

incidents. During one, a pilot flipped his aircraft end-over-end on landing (an accident so common it became known as a “pancake”); in the other an aircraft dove out of control shortly after take-off. In fact, the first fatality at the CFS did not occur until October 1913.<sup>82</sup>

Solo flying was and continues to be the key element of any pilot’s training. Pilots in the first five courses at the Central Flying School, each of which spanned four months during the period between August 1912 and March 1914, averaged approximately fifteen hours of solo time before graduation.<sup>83</sup> This number peaked right before the outbreak of war with the fourth course. During the fourth course, trainee pilots received an average of nearly twenty-four hours solo time before they earned their wings. As this thesis progresses it will show that there was, at least in the years before and during the First World War, a direct relationship between the number of hours a pilot flew solo and his success rate in the field.

By this point one question arises: why were success rates so high in the early days of the Central Flying School? This question can be answered in a number of ways. Class sizes before the outbreak of war and, for that matter, during the early months of the war were extraordinarily small. As noted, there were only fourteen students in the first class. In fact, between the establishment of the CFS in 1912 and the outbreak of war in August 1914, only fifty-two pilots trained at the CFS.<sup>84</sup> This pales in comparison to the more than 1,000 pilots turned out by the RFC’s training

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<sup>82</sup> PRO Air 1/1/2310/17, “Extracts from a Digest of Services of the Central Flying School, Upavon.” Major G. G. Merrick was killed on October 13, 1913, in a training accident. The exact details of the incident or Merrick’s role were not stated.

<sup>83</sup> Ibid.

<sup>84</sup> PRO Air 1/204/4/153, “List of Royal Flying Corps Pilots Available in England, August 17, 1914.”

programme in March 1918 alone.<sup>85</sup> Also, those who did “wash-out” of the pilot training programmes normally did so before they wrote their exams. Most often this would occur during their in-flight training, when an instructor would determine that a trainee was not a suitable pilot. Lastly, if a pupil was unsuccessful in passing his exams on the first attempt, he would be permitted to re-write the exam. In most cases, students passed on the second attempt.<sup>86</sup> Essentially, before the war began the instructors at the CFS had the time to ensure that every pilot who graduated from the training programme was sufficiently trained in compliance with RFC regulations. This changed dramatically as the war entered its second year and time became one of the training programme’s biggest enemies.

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This chapter has aimed to accomplish several goals. The first was to show that Great Britain lagged behind France and Germany in the development of a functioning air arm and an accompanying pilot training programme. Britain, however, did not necessarily fall behind in aviation doctrine, but rather in terms of scale and experience. This chapter has also shown that the training programme of the Royal Flying Corps in the pre-war period focused on the technical elements of the aircraft – how it was built and how it flew – but not on how it was to be utilised effectively in wartime. This, however, was not the result of faulty or backward thinking on the part of the British military. On the contrary, the RFC recognized the importance of air superiority and the coming need for aircraft that could actually engage in combat. But as it happened, the airplane of 1912 was simply not yet

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<sup>85</sup> PRO Air 1/678/21/13/2083, “Output of Pilots, May 16, 1916 to April 15, 1918.”

<sup>86</sup> PRO Air 1/513/16/3/77, “Report on CFS to War Office, Geoffrey Paine, January 10, 1913.”

physically capable of carrying out any tasks beyond reconnaissance and artillery direction. Also, one cannot underestimate the importance of the novelty of the aircraft in this period. There was absolutely no precedent to follow when trying to write a training manual or plan a lecture schedule for a technology that was younger, by many years, than those who were learning to use it. Although this situation certainly was not helped by Britain's tardy entry into the air race, the newness of the aircraft in the two years before the outbreak of the First World War – not ignorance on the part of the War Office or the instructors hanging on the wings of the Maurice and Henri Farmans – is mainly to blame for a training programme that struggled to prepare pilots effectively for war.

When war began in August 1914, the CFS was stripped of all its aircraft and instructors, who were promptly sent to France along with the few pupils deemed to be sufficiently trained. Lieutenant Colonel L. A. Strange spoke after the war of this departure in much the same way that many of his generation did: "It was to my great joy that I was considered fit."<sup>87</sup> However, dark days lay ahead for the Royal Flying Corps and the Central Flying School in 1915 as they did for Great Britain as a whole. The RFC system – which had been developed in the thirty months before the war and paid insufficient attention to wartime applicability and took too long to train pilots – would almost immediately begin to show its cracks and become a serious liability to the United Kingdom's war effort in the months to come.

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<sup>87</sup> Lt. Col. L. A. Strange, in Air 29/604, "Operations Record Book, Central Flying School, 1914-1942."

## An Atmosphere of Haste: British Pilot Training from the Marne to the Somme

Circumstances of the last war were in many ways peculiar, and owing to great and sudden demand for pilots it was impossible, especially in the early days, to train them adequately.<sup>1</sup>

– H. K. Harold

It has been argued by author Ralph Barker that the training programme of the RFC “surely amounted to culpable, if not criminal negligence.”<sup>2</sup> This line of argument, while not completely without merit, is overly harsh, and more tendentious than it needs to be. True, the RFC’s training programme was flawed in several important ways, and in some respects, it proved detrimental to Britain’s war in the air. However, the RFC and its efforts can be assessed soberly; to acknowledge its shortcomings does not necessarily require outright condemnation. The previous chapter outlined some of the factors that help explain the RFC’s deficiencies: novelty of the airplane, the infancy of the RFC itself, the underdeveloped aviation doctrine of the British military, and the lack of experience and established methods in training pilots. It is also worth bearing in mind that, to one extent or another, all the combatant nations experienced difficulty when it came to developing pilot

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<sup>1</sup> PRO Air 1/2387/228/11/9/99, “Service Experiences of Second Lieutenant H. K. Harold, Andover, September 1926.”

<sup>2</sup> Ralph Barker, *The Royal Flying Corps*, 220.

training programmes – although to determine whether Britain did a better or worse job of coping with those difficulties would require comparative work beyond the scope of this thesis.

Regardless of the degree to which the RFC was to blame for the shortcomings listed above, once it went to war another problem began to manifest itself: a desperate need to find replacements for pilots who had been killed or wounded in action, and to fill positions created by the rapid expansion of the RFC. As a result, the flying schools operated under incredible stress throughout the war – although, arguably, the greatest urgency arose during the period between 1914 and 1916. During these months, the rush to train pilots created an atmosphere of haste, in which pilots were sent overseas without sufficient training.<sup>3</sup> This chapter will first show that the RFC training programme attempted to stay in line with the dynamic realities of the war and was designed with appropriate standards in mind. When pilot training failed it was not because of inadequate standards, but because instructors were ignorant of them, or circumvented them deliberately. In order to demonstrate that the RFC's training programme was in touch with the real-life conditions of the war in France, the RFC's aviation doctrine during the first two years of the war will be examined. A discussion of the RFC curriculum will follow with particular focus on points of connection between the training programme and actual combat. Finally, this chapter will address the poor level of instruction along

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<sup>3</sup> "Sufficient training" is defined by the regulations outlined in PRO Air 131/15/40/218, "Letter from Commander, Training Brigade, RFC, Brigadier-General to Adastral House, Victoria Embankment 'Syllabus of what is Required of a Pilot,' letter no. TB/861, December 18, 1916." The minimum requirements for pilots heading overseas were twenty hours solo-time, time in the aircraft they would be assigned to in France, one cross-country flight, two night landings, the ability to climb to and descend from 8,000 feet, and the completion of theoretical and practical exams. It will be shown that the majority of pilots heading to France from training schools in the United Kingdom, and later from abroad did not fulfill the RFC's minimum requirements.

with the major and minor causes of the atmosphere of haste that prevailed in this period.

As the previous chapter made clear, British pre-war military planners (along with their French and German contemporaries) understood the role of the aircraft as primarily, if not exclusively, that of a reconnaissance platform. As the war bogged down in the trenches in 1914 and 1915 little changed in British aviation doctrine and the airplane continued to be seen as a support unit for the army. A number of reasons explain the lack of measurable change in RFC doctrine. Most importantly, aeronautical technology did not yet permit application of the airplane in any role beyond that of airborne observer.<sup>4</sup> Most of the RFC's aircraft, in the early years of the war, were barely powerful enough to carry a pilot and observer, let alone machine-guns or bombs. Additionally, airplanes were still seen by most army commanders as faddish, amateurish and not really capable of yielding any meaningful results on the battlefield.<sup>5</sup> Despite the reservations of many commanders, and the technological restrictions on the capabilities of the airplane, the RFC was able to provide solid information and direction for the British Army in the early months of the war, most notably at Neuve Chappelle in March 1915.<sup>6</sup> Thus, in 1914 and early 1915 the aircraft was still understood and utilised as a reconnaissance platform, and British pilot training reflected this thinking throughout the first year of

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<sup>4</sup>Malcolm Cooper, "The Development of Air Policy and Doctrine on the Western Front, 1914-1918," *Aerospace Historian* 28, no. 1 (1981) : 39.

<sup>5</sup> Cooper, "The Development of Air Policy and Doctrine," 40. Ironically enough, Douglas Haig, who has often been lambasted by many historians and the British public alike for his indifference to soldiers' lives, and a general lack of vision and innovation regarding modern warfare, was a major proponent of the aircraft. This however, should not be overly surprising to those who are more familiar with Haig and his military intellect, given that he was also a major supporter of the tank, chemical weapons and other technological innovations. Gary Sheffield, *Forgotten Victory* (London: Headline, 2000).

<sup>6</sup> Ibid.



the war. As a result, very few modifications were made to the pre-war syllabus and training regimen. In fact, the RFC continued to use the same training manual until the publication of a second edition in 1916.<sup>7</sup>

While RFC training methods underwent few modifications between 1914 and 1916, the RFC itself did undergo dramatic changes in scale and organization, stemming from the rapid expansion of the service as the war progressed. In place of a single training centre (the Central Flying School at Upavon), numerous training centres began to spring up all over the United Kingdom.<sup>8</sup> These schools were coordinated centrally by the training brigade of the War Office and the Air Ministry.<sup>9</sup> Additionally, the RFC took a page out of the German book and began to utilise private flying schools. For the most part, these private schools carried out basic flight training and used the same training curriculum and methods of the RFC schools.<sup>10</sup> The private schools, however, quickly fell out of favour with RFC authorities; many officers commented on the poor quality of students graduating and noted quite clearly their pessimism regarding the possibility of success for pilots who were privately trained. Their pessimism was not without reason, and the RFC quickly abandoned its affiliation with privately operated schools.

Perhaps the most important change in the organization of the RFC training programme in this period involved the compartmentalization of instruction. Instead of being taught at one centre for the duration of their training, pilots would undergo

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<sup>7</sup> This second edition was largely the same as the 1914 version. Most of the key sections, especially those relating to the application of the aircraft in wartime, remained unchanged.

<sup>8</sup> For example, schools were opened at Oxford, Hythe, Argyll, Southampton, Farnborough, and Reading. Many of these locations, especially Farnborough, are still used by the RAF to this day.

<sup>9</sup> PRO Air 29/604, "General Scheme of Air gunnery Training in the RFC, November 30, 1916."

<sup>10</sup> PRO Air 29/604, "Notes on the Training of Pilots, RFC Training Staff, September 2, 1916." Pupils would spend five hours be trained at private schools which were paid at the rate of £125 for each student. This fee would include the five hours of training plus certification.

elementary training (in-class and basic flight instructions) at one school (quite often the CFS), and then be moved elsewhere for their advanced flight training (air combat and gunnery). In each case, pilots were assigned to squadrons that best suited their ability, in a process very similar to the skill-based division by flight, on the basis of skill, mentioned in the previous chapter. Each of the different schools, depending on its role, contained certain number of elementary and advanced training squadrons.<sup>11</sup> This structure was maintained throughout the war. However, major modifications, including the establishment of a cadet programme in 1916, were made as the war went on.

Returning to doctrine, the war in the air changed dramatically in the summer of 1915 with Germany's introduction of the Fokker *Eindecker* and the subsequent Fokker scourge.<sup>12</sup> The *Eindecker* was the first airplane to make successful use of a forward-firing, fuselage-mounted machine gun; thanks to a recently invented interrupter gear, the *Eindecker's* pilot could fire through the blades of his propeller without destroying it. Prior to this, the impracticality of installing machine guns on airplanes had greatly limited the airplane's offensive capacity. Wing-mounted machine-guns were extremely inaccurate, while rear-mounted machine guns, fired by an observer were primarily meant for defence. The best device available to the Allies thus far – armoured deflector plates that (in theory) protected the blades of the propeller – did not inspire a great deal of confidence. Even assuming that the plates prevented the propeller from being shot to pieces, there was nothing to keep the pilot safe from his own bullets. Fokker's development of the interrupter gear solved all

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<sup>11</sup> PRO Air 29/604, "Notes on the Training of Pilots, RFC Training Staff, September 2, 1916."

<sup>12</sup> The Fokker inflicted heavy casualties on British and French pilots and allowed Germany to dominate the air war almost until the beginning of the Battle of the Somme.

these problems, and the *Eindecker* gave Germany a temporary lead in the race for air superiority.

As both sides began to equip airplanes with forward-firing machine guns, they became increasingly interested in tapping the airplane's offensive potential. Consequently, the role of the aircraft began to expand. No longer just a tool for reconnaissance, the airplane came to be seen by more officers and strategists as an actual weapon as well. Accordingly, British aviation doctrine changed in 1915-1916 to reflect this technological advance. The RFC shifted from a doctrine of reconnaissance to that of "incessant offensive" to use a phrase coined by Hugh Trenchard, commander of the RFC in the field.<sup>13</sup> Trenchard now declared that "the air service must carry the war into enemy territory and keep it there."<sup>14</sup>

This change in attitude, along with the introduction of new aircraft that could compete with the Fokker, resulted in the Allies temporarily regaining air superiority over the German Army Air Service in June 1916 (just before the beginning of the Somme Offensive).<sup>15</sup> It was also reflective of the divergence in air doctrine between Britain and the other warring nations. While the French took a much less aggressive approach to aerial combat, Britain hoped to fight the air war behind German lines, actively pursuing and engaging the enemy at every opportunity.<sup>16</sup> It was thought that this approach would foster a fighting spirit amongst the men, improve morale and give the aircraft the opportunity to provide more reliable intelligence to the army.

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<sup>13</sup> Cooper, "Development of Air Policy," 45.

<sup>14</sup> Ibid.

<sup>15</sup> Morrow, *The Great War in the Air*, 166. These aircraft included the Nieuport Sesquiplan, the Sopwith Strutter, the de Havilland DH2 (a pusher), the Bristol Scout, the FE 2, and the Spad. Additionally, the British had developed metal, as opposed to canvas, chains for their machine guns. These chains improved their firing rate and helped prevent jamming.

<sup>16</sup> At this time France was not pursuing an aggressive aviation doctrine. On the contrary, it intended to attempt to conduct its aerial operations while trying to avoid entanglements with the enemy.

Germany responded in turn, establishing an elastic defence over its lines, and sending aircraft above British camps for only artillery spotting. Although this doctrine allowed the RFC to gain air superiority over their sectors of the front it also left the RFC, and by proxy its training programme, at a serious disadvantage. It resulted in heavier casualties (RFC officer casualties jumped by 424 per cent from 332 in 1915 to 1410 in 1916) which only increased the strain on the RFC training programme.<sup>17</sup>

By 1916, the aircraft was more fully understood by RFC commanders as a tool that could act as a weapon in its own right. Even so, despite this change, and despite war thinking on the part of those like Trenchard, the army continued to use the airplane principally for reconnaissance, not as an independent fighting unit. This slowness to adapt is outlined quite plainly in the *RFC Training Manual (Part II)* of 1916, where it is stated that “the most important role of the aeroplane in war is reconnaissance.”<sup>18</sup> The training manual continues by listing the duties of the aeroplane in order of importance: reconnaissance, direction and observation of artillery fire, fighting other aircraft, destruction of material and vulnerable locations, and, finally, offensive actions against enemy troops.<sup>19</sup>

This is not to say that change was not on its way. Even if reconnaissance theoretically remained paramount, the beginnings of a shift in the RFC’s training programme are evident in 1916. The allocation of classroom and practical instructional time for trainee pilots changed considerably. New to the curriculum

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<sup>17</sup> PRO Air 1/39/15/7, “Casualties RFC/RAF for Entire War.”

<sup>18</sup> PRO Air 10/180, “Training Manual, RFC, Part II (Military Wing), Provisional 1915, Printed 1916, General Staff, War Office, London, Chapter II – The Employment of the Aeroplane in War.”

<sup>19</sup> Ibid.. By 1918 the prioritization of these tasks changed considerably.

were three hours of practical training and three hours of in-class training dedicated to bombs and bombing techniques. Along with their training in bombing, pilots were now expected to undergo three and six hours of practical instruction on the Lewis and Vickers machine guns, respectively.

Nevertheless, reconnaissance and support remained the most important role of the aircraft, and the RFC training programme continued to reflect this. The most significant change can be seen in the increased time devoted to artillery direction.<sup>20</sup> Fifty-six hours of practical instruction were spent on signalling, twelve hours on artillery observation (along with an additional three hours of in-class training) and three hours each of both practical and in-class training in photography. Also included in scouting and artillery direction instruction were three hours of wireless instruction and six hours of map-reading lessons. In summary, scouting or artillery direction accounted for 86 of the 140 hours of practical and in-class instruction, or 61 per cent.<sup>21</sup> This clearly indicates that, while the RFC still spoke of reconnaissance as the primary role of the airplane, it was sufficiently aware of ongoing changes to aerial warfare to update its curriculum and adopt a less passive approach.

The in-air training of pilots, arguably the more important aspect, also reflected trends in classroom training. In 1916, a pilot began his aerial training much as he would have if he had trained in 1913 or 1914. Typically, a pilot at the

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<sup>20</sup> In the pre-war period, artillery direction (observation, signalling, maps) was one of the primary areas of training for pilots. By 1916, it had become even more important, occupying the vast majority of in-class and practical instruction.

<sup>21</sup> PRO Air 29/604, "Letter from G. Charlton, Lieutenant Colonel, General Staff, for Director of Air Organization to General Officer in Command of Training, Commandant of School, Reading and No. 2 School, Oxford, 1 June 1916."

outset of his training would go up somewhere between five and ten times over three or four days with his instructor. During these supervised manoeuvres, pilots would practice flying circuits of the airfield and make attempts at landing the aircraft.<sup>22</sup> As in earlier years, once the instructor felt that the pupil was skilled enough to take the controls on his own, he would be allowed to conduct solo flights. On average, pilots had less than three hours in the aircraft with their instructor before they were sent up for solo flights.<sup>23</sup> Once a pilot was deemed to be sufficiently skilled in basic aerial manoeuvres he was assigned more difficult tasks, tasks such as loops, rolls, night flying, high-altitude climbs and descents, simulated emergency landings, and cross-country missions.<sup>24</sup>

It was after basic flight training that a pilot's regimen in 1916 began to differ from the instruction of earlier years. After being certified in basic aerial operations, a potential pilot was now sent to the advanced flying schools, also called gunnery schools. These advanced schools were established in 1916 to accommodate the expansion of the RFC and the changing nature of the war in the air. The first stage of this higher training consisted of instruction in aerial photography. A pilot would be given a target in the vicinity of the airfield, sent up in his aircraft, and required to return with usable reconnaissance photos of the target – normally a bridge, large building, railhead, or road intersection. Such exercises simulated the reconnaissance operations they would be expected to conduct in France.<sup>25</sup>

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<sup>22</sup> IWM 97/22/1, "Pilot's Flying Log Book, Second Lieutenant O'Grady, RFC."

<sup>23</sup> IWM 73, various pilot and instructor log books. PRO Air 4, various pilot and instructor log books.

<sup>24</sup> IWM 73, various pilot and instructors log books. PRO Air 131/15/40/218 "Letter from Commander, Training Brigade, RFC, Brigadier-General to Adastral House, Victoria Embankment 'Syllabus of what is Required of a Pilot,' letter no. TB/861, December 18, 1916."

<sup>25</sup> PRO Air 29/604, "General Scheme of Aerial Gunnery in the RFC, November 30, 1916"

Following their instruction in aerial photography, pilots were taught to use their aircraft as weapons. First, pilots were trained in machine-gun combat by utilising a rather innovative and imaginative training tool: the gun camera. Using this camera, mounted on the aircraft where the machine-gun would normally be placed, a pilot would pursue another aircraft or simulate attacking a target on the ground. The pilot took exposures to indicate a successful kill of his target.<sup>26</sup> By evaluating the exposures, instructors were able to determine not only the pilot's skill in using the aircraft's machine gun, but also his ability to manoeuvre in a combat situation.<sup>27</sup> Lastly, the new advanced pilot training devoted time to instruction in stunt flying.<sup>28</sup> Here, pilots were taught how to operate their aircraft in relationship to other aircraft, both enemy and friendly. Additionally, pilots would be taught advanced flight manoeuvres such as various turns, loops, dives and so on. This was a vital aspect of pilot training during those years given the vast technological superiority enjoyed by Germany until late 1916. In general, the instructional programme of the RFC was attuning itself more closely with the realities of the war in France.

The practical, in-class and in-air training of pilots was supplemented by strict regulations outlining the minimum qualifications of a combat-ready pilot. The first requirement was that a pilot pass a series of written exams, as in earlier years.<sup>29</sup> These written exams included six papers on the following subjects: the rotary engine,

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<sup>26</sup> PRO Air 29/604, "First Class Aerial Gunnery Tests, December 15, 1916."

<sup>27</sup> Ibid.

<sup>28</sup> Stunt flying was the name given to advanced flight training by the RFC. It has since become known as Air-combat maneuvering, or colloquially as dog-fighting.

<sup>29</sup> PRO Air 1/513/16/3/77, "Letter From War Office for Lieutenant Colonel, General Staff, for Director of Air Organization, 22 June 1916."

the stationary engine and signalling, rigging, theory of flight, and instruments, cross-country-flying, meteorology, astronomy, artillery direction, bombs, and photography.<sup>30</sup> These exams were extremely difficult. For example, to pass the signalling exam, which tested proficiency in the use of both Morse code (electric signalling) and visual signalling (flares and flags), a trainee needed to achieve a score of no less than 60 per cent, with 20 per cent being deducted for each error.<sup>31</sup> Although comprehensive, these exams were not without their flaws. The questions focused heavily on the particulars of the aircraft: how it was built, the aeronautical properties keeping it in the air, and the control surfaces governing its movements. However, they did little to test pilots on the airplane's frontline application, their ability to use the aircraft as a weapon, or their survival skills. Of course, such skills were in fact tested during aerial evaluations. Nevertheless, the changing nature of aerial warfare in 1916 dictated that even greater emphasis should have been placed on evaluating a pilot's ability to use his aircraft in combat, rather than his understanding of the aircraft itself. In this regard, the RFC's training programme failed somewhat to keep up with the war in Europe.

These written requirements were accompanied by more practical in-flight requirements. Practical exams included map reading, engine repair and construction, rigging, and gunnery testing.<sup>32</sup> The in-flight minimum requirements were twenty

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<sup>30</sup> Ibid.

<sup>31</sup> PRO Air 1/513/16/3/77, "Letter from War Office Major for Lt. Colonel General Staff for Director of Air Organization (DAO), June 22, 1916."

<sup>32</sup> Gunnery training included not only the ability to aim and fire on a target both in an aircraft and on the ground, but also the ability to assemble and care for the gun. This proficiency in the use of a machine gun was not expected of pilots in 1914 or 1915, for that matter. However, by 1916 it was determined that pilots would be required to have first-class standing in the operation of the two machine guns before being given their wings. PRO Air 29/604 "Aerial Gun Tests, December 15,



hours of solo time, two solo landings, one cross-country flight of at least sixty miles, and the ability to climb to 8,000 feet, descend, land, and then bring the aircraft to a stop in a circle fifty yards in diameter. More specifically, all BE 12 and De Havilland DH 5 pilots were required to have five hours in their respective aircraft before graduation. Similarly, all those flying Sopwith Pup and Vickers aircraft (all were classified as scouts, or what later became known as fighters) needed twenty-eight hours in their aircraft of choice. It was thought that pilots would require additional time in these aircraft before heading overseas because of their powerful engines, their increased manoeuvrability, and the dangers associated with scout flying versus observation. Essentially, these regulations encompassed all aspects of a pilot's training; in theory, in order to wear wings and fight in France, a pilot was expected to master all areas of instruction, from simple lessons on the workings of the internal combustion engine to the ability to hit a moving target using a machine-gun. As will be shown, a noteworthy percentage of pilots graduated without fulfilling these minimum requirements.

Upon completion of his training a pilot was issued his wings and a report card. This report card was filed with the air ministry and given to the pilot's squadron leader. On these reports, the pilot's amount of time in a given aircraft was indicated, along with his period of instruction. Pilots received grades of poor, fair, good, very good, or excellent in four areas: aircraft (which could include many), cross-country flying, mechanical proficiency, and quality of officer.<sup>33</sup> The vast

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1916," and "Letter From Major B. C. H. Drew, General Staff for Director of Air Organization to General Officer in Command, Training Brigade, RFC, October 24, 1916."

<sup>33</sup> PRO Air 1/1271/204/9/137, "Report on Officer Pushed to the Expeditionary Force July, 7 1916." This file contains dozens identical pilot report cards.

majority of grades fell into the good and very good ranges with excellent being more common than fair, and poor being nearly non-existent.<sup>34</sup> These report cards can help in indicating the changing instructional priorities of the RFC training programme. Still present is an evaluation category on the mechanical operation of the aircraft; by contrast, there is no discussion of the pilot's ability to use the aircraft in combat, either as a weapon or as a reconnaissance platform. Also interesting to note is the "quality of officer" category. By examining a number of reports, this category seems to be evaluating not only the pilot's leadership abilities but also, in Victorian fashion, his masculine qualities. This is vital to remember; pilots were seen as unique in their masculinity and ability to influence the war.

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From the course of instruction to the requirements for wearing wings, the training programme of the RFC was, although slightly trailing behind, in line with and well aware of the realities of air warfare on the continent. The RFC ensured that pilots, if trained in compliance with its rules and regulations and equipped with an equal or superior aircraft, would be in a position to succeed in the air. Therefore, the question arises: if British pilot training was sufficient in terms of what skills the pilots were taught and how much time was spent teaching them these skills, why did numerous squadron leaders complain about the general ineptness of their new recruits, and why did so many pilots fall victim to seemingly simple and amateurish errors? The answer is quite clear: RFC instructors were generally of poor quality and often circumvented RFC regulations. As a result, many of the trainees graduated and deployed by the RFC did not, in reality, meet the requirements the

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<sup>34</sup> Ibid.

RFC had set. Major D. Powell, in a letter dated February 22, 1916, highlights the nature of this problem:

It is not understood how an officer who is reported to be fit for overseas [duty] should, on arrival in France, be found to be so completely unsuited for the duties of a pilot, unless the officers who were responsible for his training and graduation made a very grave error in judgement.<sup>35</sup>

Powell was not the only commanding officer who had cause to ponder this question.

Problems with instruction were not just noticed by squadron leaders and other high-ranking officials; many of the pupils themselves complained about the poor quality of instruction received at the RFC flying schools. In fairness, most of these pupils understood that serious personnel shortages caused their instructors to be overworked or stressed and, furthermore, seriously affected the amount of time each instructor was able to devote to each individual pilot.<sup>36</sup> That said, however, few instructors were themselves without flaws. The vast majority were inexperienced or unmotivated. Many instructors had just graduated from the training programme themselves (they were often called “green” instructors by their pupils). Other instructors were on forced leave as a result of injury or strain. In either case, many instructors were unlikely to earn – or even want – their students’ respect, and equally unlikely to teach them well.<sup>37</sup> The RFC’s perennial dilemma was that instructors with the skill, experience and temperament to teach properly were few and far between.

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<sup>35</sup> PRO Air 1/131/15/40/218, “Letter from Major D. Powell, DDMA to General Officer Commanding 5<sup>th</sup> Brigade, Administration Wing, February 22, 1916.”

<sup>36</sup> PRO Air 1/2389/228/11/105, “War and Private Experiences of Second Lieutenant A. P. M. Sanders, 1916-1924, January 1928.”

<sup>37</sup> James McCudden, one of Britain’s most decorated aces of the war, was one such “green” instructor; he began teaching pupils with only eight hours solo. Contrary to most memoirs, his pupils did not seem to mind. James McCudden, VC, *Flying Fury: Five Years in the Royal Flying Corps* (London: Greenhill, 2002), 89-91.

The rift between student and instructor was first and most obviously evident in the mess hall. In the schools, where all dined in the same anteroom, the seating arrangements of the hall were strictly segregated. In his reminiscences Flight Lieutenant G. Martyn gives an excellent description of his mess hall that matches quite accurately those given by numerous other RFC cadets.<sup>38</sup> The mess hall was divided into four different sections: station staff, instructors, mechanics and other servicemen, and pupils. According to Martyn, there was very little mingling between these groups. Given the traditional arrangement found in Edwardian schools, this is not surprising at all. However, even though the RFC practice conformed to societal conventions (and those of the British military overall), it in no way helped the morale of pupils or instructors and was especially detrimental to their interaction and ability to trust each other.<sup>39</sup> It should also be kept in mind that this segregation was maintained throughout the school. Regardless of their age or experience, instructors did not interact with their pupils in the mess hall or, for that matter, at any time when they were off the field.<sup>40</sup> The majority of pupils, as well as some instructors, saw this lack of interaction as a lost opportunity to share ideas and form meaningful relationships. For example, Flight Lieutenant J. L. Gordon quite clearly stated his disappointment in the barrier that seemed to have blocked any kind of personal interchange between pupil and instructor:

I cannot help but feel that one would have received a more thorough service education had there been freer exchange between

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<sup>38</sup> PRO Air 1/2391/228/11/145, "The Service Experiences of Flt/Lt G. Martyn, Andover, September 1930." See also the reminiscences of L. N. Hollingsworth, T. H. G. Downing, C. J. MacKay, N. M. Bottomley, R. M. Hill, N. Leslie, and E. M. Pollard.

<sup>39</sup> Numerous reminiscences in the PRO Air 1 series speak of the mess hall as a source of mistrust between instructors and pupils.

<sup>40</sup> PRO Air 1/2391/228/11/145, "The Service Experiences of Flt/Lt G. Martyn, Andover, September 1930."

the staff and the pupils at the units to which I was posted for training. Nor do I consider the policy of having a staff room conducive to thorough instruction. It does not help to promote that unity of purpose or doctrine so necessary through a rapidly expanding service.<sup>41</sup>

In the eyes of such men, further interaction would have certainly helped in the training of pilots not only by allowing them to establish some level of trust, but also to exchange of ideas more freely.

Therefore, pupils had serious problems forming meaningful, and for that matter, even trusting relationships with their instructors. The prevailing climate of indifference was often worsened when students dealt with older and more experienced instructors. The majority of these instructors resented being away from the front and showed little interest in their pupils. They made few efforts to hide these sentiments from their pupils or their superiors. What they had in skill and experience was lost as a result of their apathy and isolation. Flight Lieutenant C. H. Haywood pessimistically noted the indifference of the many of the instructors and maintained that it was the pupils' own keenness that carried them through their training.<sup>42</sup>

The vast majority of those involved in pilot training in the RFC (either instructors or pupils) were, unlike in other services, officers and not enlisted men. It is not surprising, then, that upon entering RFC flight training, a pupil would expect there to be more camaraderie between RFC instructors and pupils than one would find in other branches of the services. However, those pupils entering the RFC from

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<sup>41</sup> PRO Air 1/2387/228/11/59, "The War Experiences of Wing Commander J. L. Gordon."

<sup>42</sup> PRO Air 1/2306/228/11/4, "The War Experiences of Flt. Lt. C. H. Haywood, October 26, 1922." Haywood speaks of pupils who could barely be kept out of their aircraft, to the point where the planes were flown until they nearly fell apart.

the British Army or Royal Navy would have been aware that segregation was customary in any officer training programme. These conventions also stemmed from the education practices of the period. Victorian and Edwardian teachers were largely seen as rigid and distant from their pupils; this was both the result of the social hierarchies at play in the classroom and the generally poor qualifications of school teachers.<sup>43</sup> This type of segregation was rampant in both the Royal Navy and Army pre-war. Both Siegfried Sassoon and Wilfred Owen make note of the lack of a personal dynamic between themselves and those who trained them as army officers. However, neither lament this relationship and both discuss it as a normal part of military life.<sup>44</sup>

So why, when this type of segregation was the status quo, did RFC trainees lament the poor relationships they had with their instructors? As noted in chapter two, the majority of RFC pilots were part of the urban middle class. These often upwardly-mobile officers would have been less accepting of the rigid Victorian ideals that justified barriers between pupil and instructor. Additionally, in the Army and Navy, officers were trained in leading groups of men, and it is entirely possible that these experiences and this type of training made them feel less isolated and more confident in their position. At the same time, the Army and Navy were training these cadets, like those in the RFC, as individuals; but they were training them as individuals who would have a responsibility to at least forty other men, all who would expect him to act as their leader and source of confidence. Perhaps it

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<sup>43</sup> Digby and Searby, *Children, School and Society in Nineteenth-Century England*, 41.

<sup>44</sup> Sassoon, *Memoirs of an Infantry Officer*, 9; and Owen, *Selected Letters*, 172.

was the very same individuality that RFC pilots were being instilled with that made them long for a closer relationship with their instructors.

Even more important was the newness of the aircraft and the RFC. In older services, such as the infantry, cavalry, and the navy, there was an established set of Victorian military protocols that dictated how pupils and instructors interacted. The RFC, however, like its technology, was essentially brand-new – to the point that most men who were learning or, for that matter, teaching the operation of the airplane were older than the technology itself. The newness of the aircraft and the relative inexperience of everyone involved in pilot training at this time (pupils, instructors, even high-ranking RFC commanders) may have encouraged in RFC cadets a desire for cooperation that was not present in other, more established services.

The general inexperience and, in some cases, obvious youth of many RFC instructors was also a major cause of many pupil's unhappiness with their training programme, as well as disrespect and outright contempt. All military institutions must contend with possible tensions that can arise when youthful, or “green,” officers are placed in positions of authority. Even the 1916 RFC syllabus devotes pages to point out:

Officers cannot gain or retain the confidence of their subordinates unless they possess not only the knowledge necessary to enable them to be efficient leaders, but also the power which is obtained through continual practice of applying this knowledge to the best advantage.<sup>45</sup>

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<sup>45</sup> PRO Air 1/130/15/49/208, “Syllabus for First Two Months of Training in the RFC Officer Cadet wing,” 1916.

The RFC's working ideal would have been to entrust students to capable and knowledgeable instructors – and preferably seasoned pilots who were back from the front (either on furlough or due to injury). Yet, as the war progressed these types of fliers were few and far between, especially in 1916 and 1917, when RFC casualties rose sharply. The plummeting number of combat-ready pilots (and experienced pilots able-bodied enough to serve as instructors), coupled with the expansion of the service, caused a severe manpower shortage within the RFC. Thus, the RFC was compelled to rely increasingly on newly-graduated pilots to form its corps of instructors.<sup>46</sup>

Many instructors did not possess the qualities their service deemed necessary to command the respect of cadets and trainee pilots. One student, P. C. Maltby, aghast at the incompetence of his instructor in aircraft mechanics, compensated by making a nuisance of himself in the machine shop and picking up what he could learn on the subject there.<sup>47</sup> Similarly, Flight Lieutenant C. H. Haywood notes in his memoirs that it was enthusiasm and a desire to survive – not anything his instructors taught him – that got him and his fellow pupils through their training. In numerous cases, newly-graduated pilots were not sent to the front but, instead, retained by their flying schools as instructors. For example, in 1916, Second Lieutenant S. C. O'Grady was promoted from pupil to instructor after only 33 hours of solo-time and without graduating.<sup>48</sup> Additionally, O'Grady became an instructor on the Maurice

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<sup>46</sup> This sounds extremely similar to the practice of using senior pupils as educators used in schools before the war. Additionally, like teachers before the war, their lack of experience did not allow for any flexibility in their education and made them reliant on the curriculum.

<sup>47</sup> PRO Air 1/2389/228/11/98, "The Service Experiences of Wing Commander P. C. Maltby, 1924."

<sup>48</sup> IWM 97/22/1, "Pilot's Flying Log Book, 2Lt. S. C. O'Grady, RFC."



Farman Short-Horn, an aircraft in which he had just under four hours experience.<sup>49</sup> Some of these rapidly promoted instructors were sent home to teach specialized courses. In one case, C. J. MacKay was assigned to the flying school at Reading as a photo instructor without having any experience in photography or photo interpretation.<sup>50</sup> The report card of Lt. W. A. S. Rough stated quite clearly, that although he was not a capable fighting pilot, he was enthusiastic – and would make a good instructor.<sup>51</sup> Of all these examples, perhaps the words of Flight Lieutenant G. Martyn are the most telling:

I was fully aware that, except for having acquired a knack for landing properly, my flying abilities were limited to the unreliable performance of gentle turns, and the thought that in the near future aircraft in which I flew would be controlled by one whose ignorance of the art of flying was only slightly more intense than my own depressed me considerably.<sup>52</sup>

If the teachers themselves suffered from such lack of confidence, it was small wonder that students were less than certain about the quality of the instruction they received.

Indeed, pupils noticed the inexperience of many of their instructors. Flight Lieutenant C. H. Haywood explicitly stated that the youth and inexperience of many of his instructors were key reasons behind the poor pupil-instructor relationship

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<sup>49</sup> Ibid.

<sup>50</sup> PRO Air 1/2387/22/11/46, “The War Experiences of C. J. MacKay, September 22, 1924.” MacKay became very disinterested in his duties as a photography instructor and immediately requested to be transferred back to the front. His request, however, was not granted. He was reassigned as a flying instructor, a position at which he proved to be a “failure.”

<sup>51</sup> PRO Air 1/1271/204/9/137, “Letter from Captain G. Paine, Commandant, Central Flying School to DGMA, War Office, London, November 6, 1914.”

<sup>52</sup> PRO Air 1/2391/228/11/145, “The Service Experiences of Flt/Lt G. Martyn, Andover, September 1930.”

within the flying schools.<sup>53</sup> He lamented the fact that because most of his instructors were straight out of flying school themselves he was not learning about new tactics or anything at all about front-line combat experience. In reference to his gunnery instructor, he exclaimed “Oh! Dear he is very young, a dear little boy!”<sup>54</sup> C. F. A. Portal noted more sourly that this situation was so bad that “ignorance prevailed among 60 per cent of instructors.”<sup>55</sup> In a rare instance of contrary opinion, H. G. Downing spoke highly of his flight instructor – but in this case, Downing was fortunate enough to have a more experienced teacher.<sup>56</sup>

Germany did not seem to have the same problem with their flight instructors. Unlike in Great Britain, instructors in German flying schools were neither officers in, nor employees of, the military. They were, on the contrary, private contractors who very well paid and in short supply.<sup>57</sup> As a result, the flying schools were in tight competition for the services of the best instructors. The schools were required to house, entertain and feed the instructors while they were not teaching pilots. Therefore, flight instructors in German schools were generally in better spirits than those in Britain because if they had been moved away from the front, they were being paid and treated very well to do so.

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If teachers were largely inept or indifferent, they still trained too many pilots, and at an inappropriately fast pace. This, however, was due largely to circumstances

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<sup>53</sup> PRO Air 1/2306/228/11/4, “The War Experiences of Flt. Lt. C. H. Haywood, October 26, 1922.”

<sup>54</sup> Ibid.

<sup>55</sup> PRO Air 1/2306/228/11/1 “War Experiences of Second Lieutenant C. F. A. Portal, September 1922.”

<sup>56</sup> IWM 88/71/11, “Diary of 2Lt. H. G. Downing.”

<sup>57</sup> Instructors were paid 200 Marks per month and an additional 200 to 300M (1914 Papiermark) per student who graduated.

created by the war. Mounting casualties and the massive expansion of the air service made it impossible to use traditional methods of instruction and still provide enough pilots for the front. The RFC senior staff, however, had little interest in ensuring that training standards were maintained. In a highly important letter dated March 21, 1916, Brigadier General W. S. Brancker wrote that pilot numbers, in spite of the poor quality and increasingly evident circumvention of regulations (which will be discussed in depth next), were still well below the requirements of the service, and therefore pilot training standards could not be increased.<sup>58</sup> Essentially, quantity and speed were chosen over quality.

Perhaps the most effective way to describe this increasingly endemic problem – which included the deliberate falsification of grades and student records – is to examine some particularly well-documented cases.<sup>59</sup> For instance, Second Lieutenant F. A. Garlick entered the RFC training programme in 1915 and eventually graduated in January 1916. In his report card, it is stated that his cross-country flight was very fair. However, in a sworn statement to his squadron commander in France he claimed that he had, in fact, never conducted a cross-country flight.<sup>60</sup> Garlick was killed in action on February 20, 1916, only a month after graduation. The story of Second Lieutenant M. A. Lillis reads very similarly. Lillis graduated from the RFC training programme in January 1916 with average and

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<sup>58</sup> Air 1/15/40/218, “Letter from Brig. General W. S. Brancker to Lt. Colonel C. J. Burke, O. S. O., March 21, 1916.”

<sup>59</sup> Information on a number of these pilots appeared in letters written from the front to the Air Ministry or training brigade. These letters were then cross-referenced with their report cards, personal testimonies and in some cases, their death information found in the Commonwealth War Graves Commission.

<sup>60</sup> PRO Air 1/15/40/218, “Letter from Major-General Commanding RFC in the Field to DDMA, War Office, February 9 1916;” and Commonwealth War Graves Commission. <http://www.cwgc.org/cwgcinternet/search.aspx>, accessed October 14, 2005.

good marks in all categories and was posted to the No. 22 squadron in France. However, less than a week after being posted, and after destroying two aircraft as a result of unsuccessful solo flights, Lillis was transferred back to the United Kingdom to be retrained.<sup>61</sup> In protest, his commanding officer wrote that it was an “error in judgement to allow him to graduate” and that he was “found [to be] unfitted to take his duties in a service squadron as a pilot.”<sup>62</sup> In spite of his clear inadequacy as a fighting pilot, Lillis had been deemed to have average to good ratings in all flying categories.<sup>63</sup>

Other telling examples are the cases of Lieutenants G. Wiggelsworth, G. W. T. Garwood and C. H. MacKay. Wiggelsworth completed his flying instruction in October 1915 and was rated as at least “good” in all aircraft whose operation he had been evaluated on, including the Maurice Farman and the Curtiss.<sup>64</sup> Despite his relatively good report-card, upon arrival in France Wiggelsworth was deemed by his commanding officer to be unable to safely operate any of the service aircraft.<sup>65</sup> In fact, Wiggelsworth openly stated to his commanding officer that he had no formal training in any of the aircraft being used by his squadron. Wiggelsworth’s commanding officer wrote to the Air Ministry complaining of Wiggelsworth and other men’s training:

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<sup>61</sup> PRO Air 1/15/40/218, “Letter from Major R. B. Wharton, Commander no. 22 Squadron, February 19, 1916.”

<sup>62</sup> Ibid and PRO Air 1/15/40/218, “Letter from Major D. Powell, DDMA to General Officer Commanding 5<sup>th</sup> Brigade, Administration Wing, February 22, 1916.”

<sup>63</sup> Ibid.

<sup>64</sup> PRO Air 1/15/40/218, “Report on Officer G. Wiggelsworth who has undergone a course of instruction. Signed Major F.V. Holt, October 15, 1918.”

<sup>65</sup> Ibid.

This is the third officer in the last week or so that has come who has never flown any type of aircraft I have in this country.<sup>66</sup>

Wiggelsworth's commanding officer continues his argument, indicating that as of January 1916, he had grounded seven pilots in his squadron as a result of poor training.<sup>67</sup>

Following the same pattern, G. W. T. Garwood graduated from the RFC training programme in late 1915 with fair marks on the BE2C aircraft.<sup>68</sup> However, upon arriving in France Garwood was judged unsuitable to operate the BE2C. When questioned about his ability to fly the aircraft, Garwood informed his commanding officer that he had actually never flown the BE2C.<sup>69</sup> Nonetheless, his report-card plainly states that he had a total of twenty-two hours in the aircraft. Being made aware of the situation by Garwood's commanding officer, Lieutenant Colonel C. C. Marindin, on behalf of the deputy director of aeronautics, wrote to the training brigade that "the present position regarding the selection of pilots for the expeditionary force is far from satisfactory."<sup>70</sup>

Lastly, C. H. MacKay trained as an RFC pilot from October 14 to November 11, 1915. He was rated as good in all of the machines in which he had been certified to fly: the Maurice Farman Short-horn, the Caudron, and the BE2C. Additionally, he was certified as having twenty-five hours solo, and was said to have passed all of

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<sup>66</sup> PRO Air 1/15/40/218, "Letter from Brigadier General, Commanding RFC in the Field to DDMA, War Office, January 3, 1916."

<sup>67</sup> Ibid.

<sup>68</sup> PRO Air 1/15/40/218, "Report on Officer who has undergone a Course of Instruction, Signed Captain R. B. Martyn, Commander 7<sup>th</sup> Wing, December 2, 1915."

<sup>69</sup> PRO Air 1/15/40/218, "G. W. T. Garwood, Signed Letter."

<sup>70</sup> PRO Air 1/15/40/218, "Letter from Lt. Colonel C. C. Marindin, General Staff for the Deputy Director of Aeronautics to the General Officer Commanding, 1<sup>st</sup> Brigade, RFC, January 5, 1916."

his technical and theoretical examinations.<sup>71</sup> However, MacKay signed an affidavit on January 1, 1916, stating that “I have never flown the BE2C at any time.”<sup>72</sup> MacKay, like Lillis and so many other pilots, whose instructors falsified their records, was forced to return to the UK for further training, even further slowing the process of preparing him for combat.

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All the problems discussed in this chapter were part of a general crisis that swept the RFC in 1915 and early 1916. Indeed, the situation had become so serious by the spring of 1916 that top-ranking officers of the RFC were aware of it. In April 1916, Hugh Trenchard, commander of the RFC, wrote:

Of the five pilots of No. 29 Squadron who have been sent out in the last three days, one has wrecked his machine landing at St. Omer and two others have done the same on landing at their own squadron's aerodrome. It seems that pilots require more practice before they are fit to fly.<sup>73</sup>

The significance of Trenchard's comment on this matter cannot be overstated. He was the highest ranking RFC officer in France at the time, and was commander of the British war effort in the air. He wrote at least six letters in April 1916 alone to the Air Ministry and War Office on the subject of poor pilot training. Such attention certainly indicates considerable concern on his part.

Lieutenant Colonel L. Charlton, a staff officer with the Air Ministry, also wrote regarding the unsatisfactory training of pilots in 1916. Charlton, however, focussed his arguments on the seeming inability of British pilots to operate their

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<sup>71</sup> PRO Air 1/15/40/218, “Report on Officer C. H. MacKay who has undergone course of instruction, November 21, 1915.”

<sup>72</sup> PRO Air 1/15/40/218, “Signed Affidavit, C. H. MacKay, January 1916.”

<sup>73</sup> PRO Air 1/15/40/218, “Letter from Brigadier General Hugh Trenchard, Commander of RFC in the field to DDMA., War Office, April 1, 1916.”

aircraft in the air and at altitude. Given an undeniable and nearly universal German superiority in air-to-air combat, Charlton felt it would be desirable for pilots to receive “frequent practice in manoeuvring for fighting positions” and “to be encouraged, to this end, in trick flying, as far as possible, in service conditions of height.”<sup>74</sup> Charlton was not the only officer to note that British pilots had difficulty operating their aircraft at altitudes above 8,000 feet. Both Major B. C. H. Drew of the General Staff and Trenchard himself wrote to the War Office to complain that British pilots were being downed by their German enemies because of an inability or unwillingness to operate the aircraft above 8,000 feet.<sup>75</sup>

Also by the spring of 1916, reports had been filling Trenchard’s desk concerning pilots who were unable to operate their Lewis or Vickers machine guns effectively. Trenchard wrote to the War Office again on April 4 to express his concern that British pilots were at a “serious disadvantage” because next to none of them were capable of operating their weapons in combat.<sup>76</sup> In his letter, Trenchard cites G. M. Murray, who arrived in France having “no idea” how to use the Lewis machine gun. This despite the fact that, as this chapter has already described, proficiency in the operation of both the Lewis and Vickers machine-guns was a requirement for graduation from the RFC training programme. Nor was Trenchard the only officer to draw attention to the ineptitude of British pilots in the operation

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<sup>74</sup> PRO Air 1/15/40/218, “Letter from Lt. Col. L. Charlton, General Staff for Director of Air Ministry to Officer Commanding A-Wing, RFC and Commandant Central Flying School, and General Officer Commanding 6<sup>th</sup> Brigade, May 10, 1916.”

<sup>75</sup> PRO Air 1/15/40/218, “Letter from Major B. C. H. Drew to Director of Air Organization, November 19, 1916,” and “Letter from Major General, Commanding RFC in the field to director of Air Organization, War Office, November 15, 1916.”

<sup>76</sup> PRO Air 1/15/40/218, “Letter from Brigadier General Hugh Trenchard, Commander of RFC in the Field to DDMA, War Office, April 4, 1916” and PRO Air 1/15/40/218, “Letter from Brigadier General Hugh Trenchard, Commander of RFC in the Field to DDMA, War Office, April 12, 1916.”

of their weapons; dozens of letters touch on this subject.<sup>77</sup> For example, C. F. A. Portal recalls that he received no training on the Lewis or Vickers guns and was sent up instead with a rifle.<sup>78</sup> Nonetheless, he was certified as being qualified to operate both weapons. Moreover, these were not men who simply fell through the cracks; the volume of documents indicates that this problem plagued the RFC on the whole. British pilots' problems with machine gun helped ensure that Germany would retain dominance of the skies in the early part of 1916. If British pilots were to have any hope against their German enemies in one-on-one combat, it would be necessary to train them better in the operation of their aircraft as weapons.

To make matters worse, there was also a significant number of complaints regarding the ability of pilots to operate their wireless and signalling equipment to conduct artillery direction. In a memorandum regarding this topic, the RFC indicated that there was a need to train pilots in the operation of their signalling equipment on a "firmer basis" and that "service grades must be made up to their full establishment in sufficient time before proceeding overseas."<sup>79</sup>

British pilots arriving in Europe in 1915 and the first half of 1916 were having difficulty performing all the skills required of a fighting pilot: skills that, in theory, they should have been sufficiently trained in before heading to the continent. Many, if not most, could not operate their aircraft safely either in the air or on the ground, they could not engage in air-combat, they could not navigate, and they could

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<sup>77</sup> This was in fact such a problem that the PRO has devoted an entire archive box, PRO Air 1/15/40, to the complaints relating to the poor training of pilots in 1915-1916. Additionally, as mentioned in the text, there are dozens of letters complaining about the poor training of pilots.

<sup>78</sup> PRO Air 1/2306/228/11/1, "War Experiences of Second Lieutenant C. F. A. Portal, September 1922."

<sup>79</sup> PRO Air 1/15/40/218, "Outline of Training for Pilots in Reference to Artillery Co-operation and bombing, May 1, 1916."



not even undertake the task that had originally been seen as the airplane's primary role: artillery observation. As this chapter has demonstrated, these problems did not result from flaws in the training curriculum itself. Rather, the curriculum, while sound, was in many ways and for a variety of reasons, imperfectly followed or ignored altogether. Unqualified, unwelcome, or unconcerned instructors did not teach well, nor did the social dynamic prevailing in RFC schools incline them to bond with their pupils. Exponentially increasing casualty levels and the rapid, wholesale expansion of the RFC created immense pressure to graduate as many pilots as possible and ship them across the Channel – even if it meant circumventing training regulations, lowering standards and, in extreme cases, falsifying a student's qualifications. Even as the British wrestled air superiority back from Germany in the second half of 1916 – at a great cost – these problems continued. To a certain extent, this reflected an understandable – and not atypical – expediency; there was, after all, a war to be won, and as quickly as possible. Still, in this case, too many lines had been crossed. By November 1916, as the Battle of the Somme drew to a close, it was clear that the RFC training programme was broken – and badly in need of repair.

## Trying to Fly Straight: Theoretical Changes and the Development of the Gosport System, late 1916 to late 1917

Training soldiers, sailors and pilots is to prepare them for what they will face in combat, and teach them how to survive. By late 1916, it had become clear that the RFC training programme was not doing what it ought to have been doing: preparing pilots for battle. The reasons for this were manifold; but, as was shown in the last chapter, the principal cause was the atmosphere of haste that developed in the RFC flying schools. This chapter will focus on the efforts of the RFC to correct the problems with its training programme. As in the previous chapters, there will be a brief discussion of the air war from late 1916 to late 1917.<sup>1</sup> Second, organizational and instructional changes made to the RFC training programme will be analyzed to show that, at least in theory, pilot training remained a reflection of the European war. Third, training outside of the United Kingdom will be discussed. An examination of personnel deficiencies facing the RFC will come fourth. Fifth and finally, the chapter will conclude with a treatment of the changes made to the RFC practical training programme by Robert Smith-Barry.

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<sup>1</sup> From approximately the end of the Battle of the Somme to the beginning of the Battle of Cambrai (November 1917).

As the race for technological superiority – and, with it – air superiority continued into 1917, the temporary lead gained by Britain and France in June 1916 as a result of superior numbers and improved aircraft design evaporated by November (the end of the Somme Offensive). Germany regained the technological edge with the introduction of the Albatros DII and DIII.<sup>2</sup> Despite this development, Britain did not adjust its aggressive aviation doctrine to suit its technological disadvantage. As a result, the technologically superior German air force, with British airplanes still crossing aggressively into its air space, was able to fight over its territory and on its terms. Consequently, RFC losses grew precipitously worse in the first few months of 1917. Between March and May, the RFC lost aircraft at a rate of 203 for every thirty kills.<sup>3</sup> This incredible ratio reflected a loss by the RFC of 41% of their aircraft. Moreover, the resulting shortage of pilots placed the RFC under even greater pressure to rush students through their training. The RFC was also forced to confront squarely the fact that the aircraft could no longer be thought of primarily as a tool for reconnaissance. Heavy losses, in air-to-air combat demonstrated clearly that the airplane was now a weapon whose purpose was to gain and keep air superiority.

This change in thinking was accompanied by a shift in how the RFC approached pilot individuality. As discussed in Chapter Two, the RFC had always instilled a subliminal sense of superiority and individuality in its pilots. By 1917, however, a much more conscious effort to encourage these sentiments in RFC

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<sup>2</sup> The DII incorporated all the strengths of the DI, while rectifying many of its major shortcomings such as poor visibility and armament. Additionally, it could outperform any aircraft the Allies had in the air at the time.

<sup>3</sup> Cooper, “The Development of Air Policy and Doctrine,” 45.

trainee-pilots can be seen. Popular fascination with the airplane and the airman – which did not cease with the outbreak of war – added to this. Pilots were seen by most of the public as heroes: they were featured in newspapers, magazines, novels and recruitment posters. Pilots transcended the dehumanization of the trenches above which they flew. They were likened to modern knights, as this 1916 comment by poet Henry Newbolt reveals:

Our airmen are singularly like the knights of the old romances, they go out day by day singly or in twos or threes, to hold the field against all corners; and to do battle in defence of those who cannot defend themselves. There is something especially chivalrous about these champions of the air.<sup>4</sup>

Most historians, without necessarily buying into such rhetoric, recognize the unique power the image of the pilot had in shaping the Western mindset during World War I.

At the outset of his training a prospective pilot was to acquire a notebook, to be used for taking notes in class, writing about in-flight instruction and recording useful information. For most pilots, these notebooks (which were to be in their possession at all times) acted a combination of training manual and diary. Beginning in 1917, each trainee was required to write the following on the very first page:

As a single fighting unit, I have the means of doing more damage to the enemy than any other in the whole army.

In everything [connected] with my work, the saying “practice makes perfect” applies more so than in any other thing; as [does] the saying that “nothing succeeds like success.”

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<sup>4</sup> Henry Newbolt cited in Paris, “The Rise of the Airmen,” 136.

Compare the importance of success and failure. If I am brought down, an important unit is lost to the army, but the possible consequences are far more important. A photographic or reconnaissance machine may also be brought down, the loss of their escort, another important unit is lost with it, may be the highest value, involving failure or success of large forces. The enemy pilot's success is almost sure to lead to further success. If I bring down the enemy, the consequences just outlined are equally as likely to follow in my favour.

The time I have to make myself a fighting pilot is all too short...I must realise that if I do not find things out now for myself, when I have instructors, and learn them thoroughly, some part of my job I have not learnt will bring me down.<sup>5</sup>

This task marks a conscious effort on the part of the RFC to promote superiority and individuality and can be explained in a number of ways. The RFC had expanded considerably from the small group of pilots in service in August 1914. Therefore, its claim of being a small and elite band had lost some of its persuasive force. Additionally, as will be explained below, the RFC was enduring catastrophic losses during these months. New pilots required an extra boost in their confidence upon entering a service in which they were more likely to lose their lives than in any other. Most importantly, the perception of the aircraft and its role in the war had changed dramatically. As the aircraft gradually became a fighting unit unto itself in the latter half of 1916 and into 1917, pilots ceased to be observers and photographers and became warriors in their own right.

These warriors were by no means invincible. The RFC had among the highest attrition rates of all British services. Casualties had jumped from 332 (20 to

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<sup>5</sup> PRO Air 1/727/144/2, "Notes for the Fighting Pilot. To be written in his Flying Note Book."

30 per cent of the service) in 1915 to 1410 (34 per cent) in 1916.<sup>6</sup> As a result of the heavy losses suffered in 1916, the War Cabinet realized that the RFC was not large enough to suit needs of the war effort. Unfortunately, 1917 would provide no relief. In fact, the problem was only exacerbated, with casualties rising even further to 5,390 (34 per cent), much of this the result of the spring scourge of 1917, also known as “Bloody April.”

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In an effort to improve the quality and quantity of pilots trained, the wings responsible for training (the Training Brigade) were centralized by the creation of the Training Division on January 1, 1917, under the supervision of the General Officer in Command of Training, Brigadier-General J. M. Salmond. This division was broken down into three group commands: London, Salisbury and York, each in command of all training activities in its assigned area.<sup>7</sup> The new training brigade was assigned a considerable number of aircraft – 1,342 of the RFC’s 4,635 aircraft, or 28.95%.<sup>8</sup> When compared to the amount of aircraft actually assigned to the France – 1,276 or 27.5% – the importance placed on training by the RFC becomes apparent.<sup>9</sup> In any case, the RFC fighting the air war in 1917 (and arguably losing it) had very little in common with the service that had sent a handful of fighters sent to France in August 1914.

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<sup>6</sup> PRO Air 1/39/15/7, “RFC/RAF Casualties for Entire War,” and Peter Lewis, *Squadron Histories: RFC, RNAS and RAF since 1912* (London: Putnam, 1959), 197. These statistics included only pilots.

<sup>7</sup> PRO Air 1/162/15/124/9i, “RFC Strength 31.3.17.”

<sup>8</sup> Ibid.

<sup>9</sup> Ibid. An additional 708 aircraft were assigned to other theatres such as Mesopotamia, Greece, and Egypt, although most of the aircraft in Egypt were likely used for training. Furthermore, 162 aircraft were assigned to the UK for home defence against Zeppelins and by this time the occasional bomber attack.

These bureaucratic alterations changed considerably the process by which pilots were trained. For example, pilots underwent their elementary in-class training in a new cadet programme: the Officer's Cadet Wing (OCW). This programme was intended to take two months (an amount of time that drew criticism from many in the senior staff). The logic behind the creation of this cadet wing was to produce new pilots for the RFC who would require minimal in-class and theoretical instruction when they arrived at their training squadrons. Included in this fundamental instruction were subjects that, in the past, had occupied much of the trainee's time in the classroom – for instance, theory of flight, aircraft materials and construction, the internal combustion engine, instruments and instrumentation, meteorology, map reading, officer conduct and military law.<sup>10</sup> Included in the officer conduct courses were lectures on etiquette, proper behaviour for officers, and the importance of morale.<sup>11</sup> These courses quite clearly indicate that the RFC, in spite of the heavy losses it was suffering in this period, remained highly interested in ensuring that its pilots were still consummate “officers and gentlemen.” What they also signify, however, is that the RFC was consciously evaluating and tweaking its training programme to ensure efficiency and quality.

Despite the intent, the cadet programme was not without its flaws, nor did it ease criticism. Initially, a number of RFC officers, such as Vice Air Marshall Sefton Brancker (the top RFC representative in the War Office), felt that the cadet programme was so long as to delay potential pilots' entry into the service.<sup>12</sup>

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<sup>10</sup> PRO Air 1/120/15/40/80, “Letter from DDGMA Brancker to DDSD Lynn, May 10, 1917.”

<sup>11</sup> PRO Air 1/130/15/40/208, “Syllabus for First Two Months Training in the RFC Officer Cadet Wing.”

<sup>12</sup> Ibid.

However, such delays were, as it happened, necessary in 1917. Not only was the RFC's confidence in its training programme lacking, as shown in the previous chapter, but the already strained RFC was ordered in June (by the War Office) to expand as quickly as possible its force from 108 to 200 squadrons.<sup>13</sup> Thus, the cadet programme acted partly as a dam to slow the tide of recruits entering the service while the RFC was trying to expand. However, like the service itself, the cadet programme was also ordered to expand – a form of quality control. To cope with the expansion of the Cadet Wing, a pre-cadet trainee school, the Officers Technical Training Corps (OTTC), was added in the fall of 1916.<sup>14</sup> The OTTC was responsible for teaching the very basics: only engines, construction, and instruments along with drill and physical training.<sup>15</sup> Additionally, the age limit was dropped from nineteen to seventeen and three-quarters (with parental permission) to allow for a deeper (and supposedly keener) pool of recruits.<sup>16</sup>

Many soon-to-be pilots did not appreciate their experiences in the OCW or the OTTC. Flight Lieutenant A. P. Ritchie, who went through the OTTC in spring 1917, was exceptionally critical of the cadet wing: “the only connection to the RFC that a cadet had was the uniform.”<sup>17</sup> His primary frustration with the regimen was what he saw as an inordinate amount of drill. Even factoring in the usual tendency

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<sup>13</sup> PRO Air 1/678/21/13/2084, “Summary of Notes on RFC Organization and Training, 1917.”

<sup>14</sup> It is important to note that many of the key changes in the RFC training programme seem to be occurring in the last third of 1916: the establishment of the cadet corps, the increasing prevalence of air-to-air combat instruction, the considerable complaints coming from the front relating to training, and the beginning of Robert Smith-Barry's incessant letter-writing to Hugh Trenchard.

<sup>15</sup> Air 1/12/15/40/80, “Army Council Instruction no. 1212 of 1917. Enlistment of Candidates for Entry to the Officer Cadet Wing and Technical Training Corps, RFC.” The majority of the time at the OTTC was spent drilling and conducting various forms of physical training.

<sup>16</sup> *Ibid.* This being said, anyone who has studied military recruitment, or for that matter, has a relative who fought in a major conflict is fully aware that these age requirements were very loosely adhered to, either by misinformation or the turning of a blind eye.

<sup>17</sup> PRO Air 1/2389/228/11/111, “War Experiences of Flight Lieutenant A. P. Ritchie, 1917-1919, January 23, 1928.”



of trainees to gripe, these complaints seem to be well-founded. Many of these recruits were officers from other services or observers attempting to become pilots; they had already endured drill during their earlier training. While he complained about the excess drilling, Ritchie did praise the OTTC for its instruction in the aircraft and in the machine gun; he considered the latter to be “the first useful piece of information since joining.”<sup>18</sup> Flight Lieutenant B. J. Jilly similarly criticized the OTTC. Like Ritchie, he believed that his time spent in the cadet course was mostly a waste; that drilling was not suitable activity for officers, prospective pilots and former infantrymen.<sup>19</sup> Criticisms aside, the intensive nature of OTTC drilling is not surprising. It falls perfectly in line with typical basic training of other military establishments in the period, and clearly displays the importance the RFC placed on discipline and morale. On a comparative note, German trainees underwent training similar to that of their British OTTC counterparts.<sup>20</sup>

After completing the OTTC programme, a cadet then moved to elementary flying school and practical instruction school, such as the one at the old Central Flying School at Upavon.<sup>21</sup> At these schools pilots were instructed in basics such as photography and in-flight gunnery along with in-air practice. Before the general adaptation of the Gosport System, these schools used the in-flight training methods explained in previous chapters and generally followed a similar curriculum, but with some major additions. At this point, it is not necessary to review in detail the course

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<sup>18</sup> Ibid.

<sup>19</sup> PRO Air 1/2389/228/11/118, “Service Experiences of Flight Lieutenant B. J. Jilly, January 2, 1928, Andover.”

<sup>20</sup> Bundesarchiv (Abteilung MA) PH 21/90, “Kompanie Vorschiff der Militärfliegerschule Hannover, September 30, 1915.” Bundesarchiv (Abteilung MA) PH 21/80, “Anleitung zur Ausbildung von Waffenmeister Storgenhilfen für die Fliegertruppen.

<sup>21</sup> PRO Air 1/678/21/13/2084, “Summary Notes on Training 1917.”

of instruction, but simply to highlight the modifications made to it. The flying schools these pilots attended had a very particular focus, and many were no larger than three squadrons, plus the accompanying logistical and support staffs. For example, pilots were sent to one school for their photography (Farnborough), and then to others for gunnery (Hythe and Turnberry).<sup>22</sup> However, wherever a pilot was being trained he always received some measure of training in the air in conjunction with his in-class training. After spending three months in these elementary schools, pilots were sent to advanced flying schools.

At the same time in Germany, pupils, after their initial training, would move on to a flight school. These were run almost entirely by private firms but commanded by military officers.<sup>23</sup> Flying schools were compensated with 8,000M for each pilot who graduated; even when a student failed the programme, the firm was still assured a payment of at least 3,500M.<sup>24</sup> Generally, pupils remained with the same firm for this segment of their training, as each flight school (*Militärfliegerschule* or MFS) and training squadron (*Fliegerabteilung*) had a preliminary school (*Vorratsschule*) attached to it. At the MFS, pilots underwent further in-class training in engines, weather, navigation, and air-combat. Additionally, they used a railed system with moving targets and mock cockpits with machine guns to simulate air combat and a grouping of large wooden poles to simulate shrapnel damage in bombing practice.<sup>25</sup> Trainees also received extensive instruction in observation (which included practice with various forms of

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<sup>22</sup> Ibid.

<sup>23</sup> Bundesarchiv (Abteilung MA) PH 5/II/359, "Geschichte der Fliegertruppen der 6. Armee."

<sup>24</sup> PRO Air 1/611/16/15/284, "Training of German Aviation Personnel, Air Ministry, September 3, 1918."

<sup>25</sup> Bundesarchiv (Abteilung MA) PH 21/85, "Werdegang der Fliegerschule (1917-1918)"

communication) cameras, spotting and artillery cooperation.<sup>26</sup> This training syllabus, like that of the RFC, clearly indicates that even into the late years of the war the air arm still substantially subordinated to the army. However, as the war entered its last phase, German training gradually became more focussed on air-combat and less on artillery observation.

Shifting back to Britain, structural changes and expansion were not the only modifications made to the pilot training programme in 1917. In fact, one could argue that the changes made to the theoretical and, even more importantly, practical nature of instruction was considerably more influential. For example, stunt flying (dog-fighting) had, by 1917, become a major component of a pilot's training. This stood in stark contrast to the training regimen of years prior. Instead of receiving very brief lectures on aerial fighting and the use of their aircraft as a weapon, trainee pilots were now receiving instruction in various different courses, all which fell under the umbrella of stunt flying.

Before trainees were instructed in the nuances of aerial combat, they received general instruction on "fighting in the air." For this purpose the lectures were divided into two areas: attacking and defence. Students were first instructed on how to conduct patrols, either alone or as part of a formation, and certain precautions to take while on patrol, such as maintaining alertness and flying in random patterns.<sup>27</sup> Once they encountered an enemy, pupils were given four priorities to consider when attacking: one, surprise; two, close range; three, careful aim; and four, approach

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<sup>26</sup> Bundesarchiv (Abteilung MA) PH 5/II/359, "Anweisung für Erweiterung des Flugsbeobachtungs-Meldendienstes in Operations-Etappengebiet der 6. Armee, 11.10.15"

<sup>27</sup> PRO Air 1/727/144/2, "Hints to Pupils on the Training of Scout Pilots. 1917." A patrol was a pilot leaving his airbase, either alone or in a group, to monitor a particular area, to prevent enemy incursions or support friendly actions.

from behind and below.<sup>28</sup> Within these four categories, instruction went into even greater detail. For example, pupils were reminded to use as much as possible natural conditions to their advantage – haze, clouds, wind, and the sun.<sup>29</sup> The lectures were also careful to teach pupils common errors to be avoided in combat, such as attacking in a straight dive or subjecting oneself to the guns of an enemy pilot or observer. Similarly, the instructors went to considerable lengths discussing the different methods of attacking either single-seat or two-seat aircraft.<sup>30</sup> Instruction on defence was not nearly as thorough, stating that “it is laid down that scouts [fighters] should never act on the defensive,” and was limited to informing the pupil that, if attacked, he should either turn away from the attacker and try to escape or turn directly at him.<sup>31</sup> Whether being taught to attack or defend, pilots were reminded time and again that speed and altitude were the two most important advantages and must be maintained at all costs.

Beyond these basic instructions in offensive and defensive flying were more detailed lectures on specific elements of aerial combat, including night and formation flying.<sup>32</sup> In this section, pilots were first taught the origins of the formation – which had been devised to defend against the Fokker menace. It was then explained that the more evolved version of the formation, including reconnaissance and offensive patrols, had more diverse purposes, such as providing defence for reconnaissance aircraft or actively seeking out and destroying enemy

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<sup>28</sup> Ibid.

<sup>29</sup> Ibid.

<sup>30</sup> Ibid.

<sup>31</sup> Ibid. This attitude reflected quite accurately the aggressive approach to the air war adopted by the RFC.

<sup>32</sup> PRO Air 1/2387/228/11/39, “The War Experiences of Second Lieutenant N.M. Bottomley.”

aircraft.<sup>33</sup> Essentially, pilots were told that much of their work would be conducted in cooperation with other aircraft, and that flying over the front alone was rare.

Pilots' instruction in stunt flying had become quite detailed by this point. This lecture course was quite curious in its arrangement. It discusses typical aerial manoeuvres such as banking, side-slipping and spinning.<sup>34</sup> However, these matters were framed in the context of aerial fighting and how they could be applied to it. In previous years such instruction had simply focused on how to conduct the manoeuvre.<sup>35</sup> For example, the lectures on looping and Immelmann turns essentially gave the basic details on what inputs to make into the controls, but they also informed pupils that looping was a good way to get away from an enemy, or that an Immelmann turn is the "quickest way to about turn."<sup>36</sup> Flying instruction on spinning also changed considerably. In previous years, pupils were taught to avoid spinning. However, by 1917, this had changed. First, pupils were instructed on the most effective way to put their aircraft into a spin and how to utilise it in combat.<sup>37</sup> What these changes indicate is a major shift in the thinking of the RFC; the aircraft was no longer thought of as merely an observation platform, reliant the army below for direction. Instead, it was seen by 1917 as a fighting unit capable of waging its own war independent of interaction with forces on the ground.

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<sup>33</sup> PRO Air 1/727/144/2, "Formation Flying."

<sup>34</sup> Banking is another term for turning. Side-slipping is using opposite control surface inputs to basically slide the aircraft in a way that the nose is not pointing in the direction the aircraft is going, not unlike how a car would on an icy road.

<sup>35</sup> PRO Air 1/727/144/2, "Notes on Stunt Flying, May 17, 1917."

<sup>36</sup> Ibid. An Immelmann turn was named after German ace Max Immelmann. It involves rolling the aircraft until it is upside down, then pulling back on the control stick until the aircraft is upright again, only pointed in the opposite direction it was at the start of the manoeuvre.

<sup>37</sup> Ibid. In the past, such instruction would have never existed. For instance, pilots were taught that spinning was the best way to lose height quickly. Furthermore, pupils were taught that spinning their aircraft was the best way of "getting away from a fight which you do not wish to carry on."

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Although small training centres existed in Canada and Egypt from the outset of the war by 1917 saw considerable expansion of the RFC training programme beyond the United Kingdom.<sup>38</sup> As mentioned, Britain's training system was being stretched to the limit 1917. As a result there was a need to increase the scale of pilot training outside the British Isles. Canada had been supporting the war effort since the beginning of hostilities, but pilot training did not begin there until January 1917 at Long Branch (now in Mississauga). By the end of the war, facilities in Canada had grown to include centres in Armour Heights, Beamsville, Hamilton, Leaside, Toronto, and Camps Rathburn, Borden and Mohawk (all in south-central Ontario).<sup>39</sup> The schools in Canada used the same methods as in the United Kingdom and were responsible for the major part of a pupil's training, from elementary to advanced instruction. However, the final stages of instruction and graduation were still conducted in Great Britain. Unlike during the Second World War, most pilots trained in Canada were Canadians, recruited both from the civilian population and other Canadian service elements. Recruitment in Canada followed a very similar pattern similar to that in the United Kingdom: the vast majority of the 2,500 pilots who completed training in Canada were of an urban background.<sup>40</sup>

In Egypt, the No. 20 Training Wing was formally established in November 1917, with its headquarters at Heliopolis. Contained within were the No. 32 and No.

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<sup>38</sup> The training centres outside the United Kingdom remained under the direct control of the Air Ministry, RFC and later the RAF, with little or no intervention from local governments or militaries.

<sup>39</sup> Larry Milberry, *Canada's Air Forces at War: Volume One* (Toronto: CANAV Books, 2000), 40. In the winter of 1917-1918, the training programme was moved to Texas to avoid the Canadian winter.

<sup>40</sup> *Ibid.*, 45.

38 Training Wings, along with the No. 5 Cadet Wing and No. 3 School of Aeronautics.<sup>41</sup> Before November 1917, the Egyptian training centre was located at Ismailia, and was so small when it opened in June 1916 that it had only two aircraft; most of its buildings were not yet complete. As in Canada, pilots had to complete their training in the United Kingdom. The training programme in Egypt was so small before mid-1917 it is barely worth mentioning. In the last two months of 1916, only forty pilots graduated. By the end of 1917, this number had grown only to a one-month maximum of fifty-nine (August), with the monthly graduation average being thirty-seven pilots. This number pales in comparison to the monthly average of 435 pilots the RFC home establishment maintained.<sup>42</sup> It was after the formal establishment of the training wing that Egypt made a measurable contribution to the British war effort: the number of graduates jumped from 49 in December 1917 to 139 in January 1918. This number is indicative of three important points: one, the importance of the resources added to the training wing late in 1917; two, the surge in pupils being placed in the training programme in early 1917, and three, the manpower problems faced by the service.<sup>43</sup> By the time the war ended the training wing in Egypt (expanded to brigade size in February 1918) was a fully-functioning training centre – complete with bombing, observation, fighting, and instructors’ schools – and a full cadet programme, which alone passed 1,774 cadets to the higher schools between November 1917 and November 1918.

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<sup>41</sup> PRO Air 29/604, “History of Training of Pilots in Egypt, RAF Production File.”

<sup>42</sup> PRO Air 1/678/21/13/2083, “Return Output of Pilots 16 May 1916 to 15 April 1918.”

<sup>43</sup> Most of the men who graduated in January 1918 likely entered the programme sometime in the spring or early summer of 1917.

The schools in Egypt and Canada were not immune to some of the key problems – especially apathetic or incompetent instruction – that plagued those in the United Kingdom. Flight Lieutenant L. L. MacLean, who was trained in Egypt, writes of a poor pupil-instructor dynamic in Egypt. First, he states plainly that instructors were more interested in the care and maintenance of their aircraft and conveying that interest to their pupils than they were in actually teaching flying.<sup>44</sup> Additionally, he indicates that many of the instructors who taught at the Egyptian schools were pupils retained after completing training their training. As in Britain, facilities in Canada and Egypt employed many instructors who were incompetent, ignorant, or both.

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Despite the expansion of its training programme, the RFC still faced a massive deficiency in pilot output. By the summer of 1917, this deficiency was nearing crisis level – the RFC required 5,841 pilots to replace those lost early in the year and to facilitate the expansion of the service. However, the RFC had only 4,650 pilots available to fill this gap, leaving a shortfall of at least 800 pilots, or, if possible wastage is factored into the equation, one nearly 2,000.<sup>45</sup> This strain, as Squadron Leader (second lieutenant at the time) A. C. Maund points out in his memoirs, created a very uncomfortable and tense situation in the flying schools; each day was “more weary than a night’s rest could cure.”<sup>46</sup> Additionally, Squadron Leader (second lieutenant) Sir N. Leslie remembered that, “the work commenced

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<sup>44</sup> PRO Air 1/2306/11/8, “RAF Staff College, Lt. L. L. MacLean, Flight Experiences, 1922.”

<sup>45</sup> PRO Air 1/683/21/13/2234, “DAO – Report on Deficiencies in Training, June 26, 1917.”

<sup>46</sup> PRO Air 1/2387/228/11/4, “The War Experiences of Squadron Leader (2<sup>nd</sup> Lt.) A. C. Maund, September 30, 1924.”



before dawn and didn't stop until nightfall.”<sup>47</sup> Essentially, the RFC was doing all it could with the resources it had.

The RFC command felt there were three possible solutions to this problem: shorten pilot training, recruit officers who did not require cadet training, or obtain additional instructors.<sup>48</sup> Given that the quality of pilot training was already being called into serious question, shortening the length of instruction was simply not an option. At the same time, it might have been possible to find pilots who did not need to undergo cadet training, but that number would have not been anywhere near the requirements of the service. Thus, the RFC chose the only possible option: to find more instructors to train pilots and to ensure that those instructors were as skilled as possible.

In the past, instructors had been placed in their positions with little or no guidance in how to teach flying. This, as has been shown, led to a situation in which many instructors were either incapable of properly instructing their pupils or were uncomfortable with their ability to do so. To remedy this, instructors, beginning in spring 1917, were required to undergo a training course of their own, before being permitted to instruct students formally.<sup>49</sup> The training course for instructors was neither on the same scale, nor of the same intensity as the regimens imposed on their pupils. Nonetheless, it was structured quite similarly to that of actual cadet instruction – a blend of in-class, practical and in-flight training.<sup>50</sup> In-class

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<sup>47</sup> PRO Air 1/2387/228/11/36, “The War Experiences of Squadron Leader Sir N. Leslie, September 24, 1923.”

<sup>48</sup> PRO Air 1/683/21/13/2234, “DAO – Report on Deficiencies in Training, June 26, 1917.”

<sup>49</sup> It can be safely assumed that some level of *ad hoc* training was undertaken in the RFC by squadron leaders and senior pilots who were not officially certified as instructors.

<sup>50</sup> PRO Air 1/727144/2, “Central Flying School – Wing Fighting Instructors, Second Course, June 1917.”

instruction included lectures on common pupil errors and note-taking, along with lectures on basic aircraft manoeuvring. Hands-on practical instruction involved working with the gun cameras and machine guns. Lastly, and more importantly, considerable time was spent in the air. During these in-flight lessons, teachers-in-training were shown and then expected to carry out various manoeuvres in the aircraft they would eventually use to instruct their pupils. Following this week-long course, instructors were tested on their skills in the air, in the form of aeronautical exams, and on the ground with written examinations.<sup>51</sup>

This change only slightly improved the relationship between instructors and pupils. As Lieutenant L. L. MacLean recalls, the majority of flying instructors still did not enjoy their work.<sup>52</sup> In fact, MacLean hints that the new instructor training course might have actually exacerbated their frustration. In describing instructors as “bitter,” MacLean indicates that much of their indifference and anger resulted not from having to teach flying, but actually from the length of time their teaching duties kept them away from the front.<sup>53</sup> He tells of numerous instructors who had either grown jaded or were utterly exhausted as a result of six months or more of teaching pilots with little or no respite. Being required to spend extra time learning how to teach would have only heightened the instructors’ desire to promptly complete their time in the country.

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The theoretical, organizational and in-class changes made to the training programme were supplemented by major changes made to in-flight instruction,

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<sup>51</sup> Ibid.

<sup>52</sup> PRO Air 1/2306/11/8, “RAF Staff College, Lt. L. L. MacLean, Flight Experiences, 1922.”

<sup>53</sup> Ibid.

largely the product of Robert Smith-Barry and his Gosport System. It is useful to provide a brief biography of Smith-Barry, before discussing in detail his modifications to the training programme. Robert Smith-Barry was born in 1886, the only son of a lieutenant in the Grenadier Guards and a mother of noble birth.<sup>54</sup> Smith-Barry lived a rather privileged youth that involved considerable mischief. As he grew older his high-spirited personality led him to learn to fly at the Bristol School of Aviation at the age of twenty-four and then to buy his own plane.<sup>55</sup>

Smith-Barry was in the very first class to graduate from the Central Flying School along with the likes of J.M. Salmond and Hugh Trenchard. Throughout his earlier career he was known as a joker on the ground and a reckless trickster in the air, one who was capable of scaring his senior officers and colleagues alike.<sup>56</sup> Smith-Barry was sent overseas with the RFC upon the British declaration of war. He was one of the RFC's first casualties. On August 18, 1914, his aircraft spun out of control and crashed (the cause was not known); Smith-Barry's observer was killed in the crash, and Smith-Barry suffered two broken legs and a broken knee cap. He did not receive proper medical treatment until later in the year, and as a result would spend the rest of his life walking with a cane.<sup>57</sup> Despite his injuries and discouragement from his fellow servicemen, Smith-Barry once again found himself in the cockpit of an aircraft and participated in the Battle of the Somme. Smith-

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<sup>54</sup> Tredrey, *Pioneer Pilot*, 2. Tredrey's subtitle – the “Great Smith-Barry who Taught the World to Fly” – clearly indicates the books overwhelming bias in favour of its subject. It also contains a number of conceptual and argumentative flaws. Nonetheless, Tredrey provides the best narrative available of Smith-Barry's career and the Gosport system. Thus, his book acted as an effective starting point.

<sup>55</sup> The Bristol School of Aviation was one of Britain's largest private flight schools; over 400 pupils passed through the school between 1910 and 1914.

<sup>56</sup> Tredrey, *Pioneer Pilot*, 19-21. This personality trait was certainly reflected in his approach to pilot training.

<sup>57</sup> Geoffrey Norris, *The Royal Flying Corps*, 204.

Barry, crippled legs and all, performed well enough upon returning to service that he was placed in command of No. 60 squadron.

After his appointment, Smith-Barry became a champion of sorts of the under-trained pilot. He felt that the current system of training pilots was murderous and that novice aviators were so ill-suited for aerial combat over the Western Front that they were merely “Fokker fodder.”<sup>58</sup> In late 1916, he wrote a series of letters to Hugh Trenchard (commanding officer of the RFC in France) outlining what he saw as the key problems with pilot training and possible solutions. These recommendations included the universal use of dual-control aircraft (both elementary and advanced training aircraft), with the pupil always in the pilot’s seat and constantly in control of the aircraft, unless intervention from the instructor was required.<sup>59</sup>

With the words of a clearly impatient Trenchard – “don’t worry us anymore with your complaints. If you think you can do better, go and do it,” the “eccentric genius” Smith-Barry was placed in command of the No. 1 Reserve Squadron at Gosport on December 24, 1916.<sup>60</sup> Trenchard’s words acutely reflected the relationship he had with Smith-Barry; put simply, the two men did not get along well at all.<sup>61</sup> Smith-Barry saw Trenchard as a butcher needlessly sending pilots to their death; conversely, Trenchard saw Smith-Barry as a nuisance. Still, it was with a certain sense of confidence that Trenchard appointed Smith-Barry. As he told his

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<sup>58</sup> Ibid.

<sup>59</sup> Tredrey, *Pioneer Pilot*, 53.

<sup>60</sup> Ralph Barker, *The Royal Flying Corps*, 194; and Sir John Slessor, *The Central Blue: Recollections and Reflections by Marshal of the Air Force* (London: Cassell and Company, 1956), 25.

<sup>61</sup> The two men’s professional relationship was so poor that Smith-Barry was actually involved with a group that attempted to remove Trenchard from his post as General Officer in Command, RFC in France. This relationship could also be cited as the reason for Smith-Barry’s transfer to the United States as part of an officer exchange in spring 1918.

subordinate: “It’s time you tried out all these ideas you’ve been pestering me with. I’ve told the training people, so don’t let them or yourself down.”<sup>62</sup>

Once in place, Smith-Barry immediately altered the training programme at Gosport, and drastically so. First, he reorganized the school. Although he still used the flight system, he cut the number of training flights from four to three. Each flight piloted a different aircraft; flight A was for training *ab initio* and utilised light aircraft to teach basic flying skills and build up solo time; flight B (intermediate) used heavier aircraft and those that would see service at the front; flight C (advanced) taught stunt flying (dog-fighting) in scout aircraft.<sup>63</sup> Every pupil spent one month in each flight. In the new training plan, Smith-Barry also included a strict checklist of tasks that a trainee was required to be able to undertake confidently before he was advanced to the next flight.<sup>64</sup> Included in these expectations was the provision that if an instructor felt that a pupil lacked the skill required to be a scout, the pupil was to be reassigned to training as an artillery pilot or removed from flight training altogether.<sup>65</sup> Another key modification was the implementation of commonality in each flight. As opposed to a large number of different aircraft at a training centre, all aircraft in each flight at Gosport were to be of the same type, and all aircraft that were in small numbers or obsolete were promptly disposed of.<sup>66</sup>

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<sup>62</sup> Ralph Barker, *The Royal Flying Corps*, 194.

<sup>63</sup> IWM 90/781, “Flying Instruction, 1918, Brigadier-General Robert Smith-Barry.”

<sup>64</sup> The requirement at Gosport were not very different than those expected of pupils in the traditional training system: stalling aircraft, turns, landing, taking off and so on.

<sup>65</sup> These provisions were also included in previous RFC training programmes. Smith-Barry, however, had the luxury of closely supervising his single squadron to ensure that these rules were adhered to.

<sup>66</sup> Potpourri air forces were common during the First World War. For example, the RFC had over 50 different types of aircraft in its inventory by the end of 1915. However, efforts were being made to standardize the RFC airplane types by the end of the war. Most air forces now make a conscious effort to maintain as few types of aircraft in their arsenal as possible.

Smith-Barry's most important change to British pilot training was the implementation of the dual-control method, which he believed would solve many of the problems facing the RFC training programme. Earlier, many pupils had complained that they had not had enough time at the controls. Instructors had rarely given pupils the opportunity to fly single-control aircraft themselves, for fear of crashing. Smith-Barry felt that expecting pupils to fly solo in aircraft without first giving them adequate opportunity to operate those craft exposed them to unacceptable and unnecessary levels of danger. Confirming Smith-Barry's views, Flight Lieutenant A. P. Ritchie indicated that he learned next to nothing during flights with his instructor, and was only really able to gain a feeling for flying when he was placed in an aircraft on his own.<sup>67</sup> Flight Lieutenant W. Boslock reported the same problem: "duals amounted to nothing more than passenger flights."<sup>68</sup> Fortunately enough, Ritchie and Boslock lived to record their complaints, while many likely died on their first solo flight, not having received sufficient training. Smith-Barry firmly believed that the dual-control method (which had already been put into limited use by both France and Germany) was the ideal way to teach flying; it vastly increased the amount of time a pupil spent at the controls of the aircraft. Smith-Barry believed that the pupil should "always be in the pilot's seat," with the instructor using his controls only to escape too-dangerous moments or to conduct and demonstrate more complicated manoeuvres.<sup>69</sup>

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<sup>67</sup> PRO Air 1/2389/228/11/111, "The War Experiences of Flight Lieutenant A. P. Ritchie, 1917-1919, January 23, 1928."

<sup>68</sup> PRO Air 1/2389/228/11/96, "The War Experiences of Flight Lieutenant W. Boslock, Andover, September 3, 1926." Duals, in this case, meant flights with the instructor, not in dual-control aircraft.

<sup>69</sup> Norris, *The Royal Flying Corps*, 206. Dual-control aircraft were in very short supply in the RFC at the start of 1917. Also, because airplanes were so noisy, a better method of communication between pupil and instructor was needed. A solution to the first problem was rather simple: what dual-control

Risky situations were dealt with in a similar manner. Instead of having the pupil fly the aircraft in straight lines and conduct controlled and predetermined manoeuvres, Gosport instructors deliberately put the aircraft into spins, rolls or dives and forced their pupils to recover the aircraft by using his controls.<sup>70</sup> The philosophy behind this was quite simple: it gave the pupil experience in dangerous situations, helping prevent panic if he found himself in such situations during combat. Additionally, because spins, dives and rolls were common evasive and offensive actions used against enemy aircraft, being put through such manoeuvres familiarized the pupils with stunt flying early in their training. The Gosport system's more cavalier approach to in-flight training could especially be seen when pupils were flying solo. Once in the air, pupils were allowed to do whatever they wanted in the aircraft "as long as [they] didn't crash."<sup>71</sup> One visitor to the Gosport school likened the airfield to a bee's nest, with aircraft coming and going from all heights and directions.<sup>72</sup>

Smith-Barry developed the Gosport system using what he said was "common sense."<sup>73</sup> Such a comment may have been slightly self-aggrandizing. Nonetheless, the Gosport system allowed the pupil more time at the controls of the aircraft. It should be remembered, however, that the Gosport System operated in tandem with the revised in-class regimen; fewer courses on the theory of flight, materials, or the internal combustion engine were required.

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aircraft were available were assigned to the Gosport school for training. As the war progressed, more dual-control airplanes were manufactured. To improve communications a dual speaking-and-ear tube, known as a "Gosport Tube," was developed by the school's mechanics.

<sup>70</sup> IWM 90/781, "Flying Instruction, 1918, Brigadier-General Robert Smith-Barry."

<sup>71</sup> Tredrey, *Pioneer Pilot*, 90.

<sup>72</sup> *Ibid.*

<sup>73</sup> IWM 90/781, "Flying Instruction, 1918, Brigadier-General Robert Smith-Barry."

In July 1917, Brigadier-General J. M. Salmond (commander of the RFC Training Brigade) visited the Gosport school and was immediately impressed with the progress Smith-Barry had made in six months. Salmond ordered all three units at Gosport (the Nos. 1, 25 and 55 Squadrons) to be merged into the School of Special Flying, with Smith-Barry as the commander. Even more important, Salmond ordered that all new flight instructors were to attend the school and to become familiar with its methods, and to apply those methods when instructing their own pupils. To this end, five of the school's six new squadrons were tasked with training instructors. The remaining squadron was to conduct flight training as per the previous system. This, combined with the distribution of Smith-Barry's paper on flying titled "General Methods of Teaching Scout Pilots," the Gosport System to be diffused throughout the RFC.<sup>74</sup>

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The first ten months of 1917 saw dramatic changes to the training programme of the Royal Flying Corps. The theoretical curriculum had changed significantly to reflect continually improving aeronautical technology and the changing role of the aircraft. To this end, the focus of RFC theoretical training was no longer based on the view that the airplane was merely an observation platform, but on the recognition that it was an independent fighting unit. Similarly, the approach to and attitudes regarding RFC pilots had changed as airplanes became more potent and played a greater role. The bureaucracy and size of the RFC was increasing as rapidly as the aircraft's role in the war; the RFC now had a fully-functioning network of training centres, a far cry from the one small patch of land

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<sup>74</sup> Tredrey, *Pioneer Pilot*, 67-70; and Norris, *The Royal Flying Corps*, 206.



where the first pilots were trained in 1912. Lastly, the RFC, thanks to Robert Smith-Barry and the Gosport System, had begun to tackle its in-flight instruction problems. Relating to Smith-Barry and Gosport, one question still remains: was the system really the life-saver that so many have claimed it was?

## Pilot Training and its Role in Allied Aerial Victory: Late 1917 to War's End

By the start of the battle of Cambrai in November 1917, the first pilots instructed under Britain's new in-flight training regimen – the Gosport System – had begun to join combat squadrons. The air war these men entered was vastly different from that which the first fliers had fought. The RFC, instead of simply acting as an observation tool for the army, had become a full component of the British war effort: it was capable of independently monitoring and attacking the enemy. The skies themselves had turned into battlegrounds, as Allied fighters continually jostled with their German enemies for air supremacy. It is not surprising, then, that the British system of pilot training barely resembled its former self: it had become a complete military bureaucracy capable of graduating over 500 pilots per month. Furthermore, what those pilots were taught, and how they were taught, had also changed dramatically. The goal of this final chapter is to highlight these changes and attempt to explain their effects on British pilot training.

This chapter will begin with a short treatment of Britain's aggressive combat application of the aircraft in the last year of the war. Following this will be an overview of the events and motives behind the merger of the RFC and Royal Naval Air Service (RNAS) in April 1918 and the effects this amalgamation had on

pilot training in Britain. As in previous chapters, it will be argued that in modifying its training programme the RFC/RAF demonstrated elasticity in its thinking and acute awareness of the war that was being fought over the continent. Last and most important, this chapter will show that the changes made to pilot training in 1917, once implemented throughout the RFC/RAF, dramatically improved the quality of pilots graduating and may very well have saved hundreds, if not thousands, of British lives in what was the most intense year of the air war.

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Britain maintained its aggressive aviation doctrine in late 1917 and 1918. By the time the Germany launched what would be its final offensive of the war (March 21, 1918), offensive use of the aircraft had become a major component of Britain's combined-arms assault against German forces. Additionally, Britain approached something resembling technological parity with its German enemy, with the introduction of the Sopwith Camel, Bristol Fighter, and SE5.<sup>1</sup> True, the RFC/RAF continued to be the eyes and ears of British artillery. Nonetheless, artillery observation had ceased to be the RFC/RAF's *raison d'être*, and was overtaken by applications that more closely resemble contemporary wartime applications of the airplane: a combination of air superiority and close air support.

Air superiority remained as important in 1918 as it had been in 1917 and 1916. Although it lost aircraft at a higher rate than Germany, Britain continued to succeed at keeping the air war over German lines. In these months the concept of air superiority expanded to include a new goal: protecting the large numbers of RFC/RAF aircraft assigned to ground attack and close air support, functions that had

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<sup>1</sup> Slessor, *The Central Blue*, 19.

become larger part of the RFC repertoire in 1917. In 1918, the RFC/RAF used airplanes against enemy ground forces (targeting as enemy troops, artillery positions, trains, airfields and even tanks) on a much larger scale.<sup>2</sup> In fact, during Germany's offensive and the subsequent Allied counterattack, ground support operations was the purpose of most RFC sorties.<sup>3</sup> The aircraft had long ceased to be a novelty; instead it was now "an essential factor in the offensive military operations."<sup>4</sup>

The air war also expanded exponentially. The RFC/RAF had nearly 30,000 pilots in its ranks by the end of the war, as opposed to the 146 in service in August 1914. This increase in scale and intensity caused stiff competition between the RFC and RNAS for fuel, aircraft, materiel and pilots.<sup>5</sup> It was thought that the merger of the overland and naval services would alleviate these supply strains and promote cooperation in the air war.<sup>6</sup> Additionally, as aircraft grew in size and power, some members of the British military came to think that the air was becoming a major field of battle and that the airplane warranted its own service.<sup>7</sup> Primarily as a result of these concerns (logistics and the growing importance of the airplane) the Royal Flying Corps and Royal Naval Air Service were, on April 1, 1918, merged into a single service: the Royal Air Force. However, given the scale of the RFC compared to the RNAS, it could easily be argued that the RFC absorbed the RNAS.<sup>8</sup>

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<sup>2</sup> Barker, *The Royal Flying Corps*, 433.

<sup>3</sup> Morrow, *The Great War in the Air*, 312.

<sup>4</sup> PRO Air 1/2267/209/70/34, "Air Ministry to Air Council."

<sup>5</sup> The RFC was responsible for over land aerial operations during the war and was under the direction of the British Army. The RNAS was a branch of the Royal Navy.

<sup>6</sup> *Ibid.*, 418.

<sup>7</sup> Barker, *The Royal Flying Corps*, 417.

<sup>8</sup> The RNAS had approximately 3,000 aircraft and 5,300 officers at the time of the merger. The RFC had had 10,000 aircraft and over 18,700 officers.

Naturally, the organization of pilot training was directly affected by the merger of the two services. The Directorate of Training (DOT) replaced the Training Division.<sup>9</sup> Reporting to the DOT were five different training areas: London, Salisbury, Birmingham, York, and Glasgow.<sup>10</sup> Each of these was ultimately responsible for training within its own area but received considerable direction from the DOT. Under the umbrella of the DOT, the RAF worked towards streamlining its training programme. The new RAF began to adapt what it called the “all-through” approach to pilot training. Under this new system, pilots would remain at one location for the entirety of their training. One exception was gunnery training, for which pilots would be sent to RAF Fighting Schools, the successor of the Aerial Gunnery and Aerial Fighting Schools.

A brief analysis of the RAF fleet in June 1918 indicates that pilot training remained one of the service’s top priorities. At this time, the DOT was assigned 1,203 aircraft; nearly one-third (368) were the Avro. Most were of the same model; the homogenization of training aircraft recommended by Smith-Barry had been fully integrated into the RAF. Moreover, the DOT possessed over one hundred Sopwith Camels (Britain’s top-of-the-line fighter at the time), which it used for advanced flight training courses. All in all, the DOT was in charge of approximately 21 per cent of RAF aircraft, an allocation of resources second to that devoted to front-line squadrons on the continent.<sup>11</sup>

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<sup>9</sup> PRO Air 1/678/21/13/2084, “Summary Notes on Training, 1918.”

<sup>10</sup> Ibid.

<sup>11</sup> PRO Air 1/162/15/124/9i, “Aeroplanes and Seaplanes on charge of Royal Air Force at 30th June 1918.” The total size of the RAF at this time was 16433 aircraft.

In-class instruction changed only somewhat from the year before. The Officers Technical Training Corps (OTTC) and the Cadet Wing (OCW) continued to teach the basics: theory of flight, aircraft construction and materials, engines, physics, meteorology, machine guns and so on.<sup>12</sup> Nevertheless, there were some noteworthy changes to basic and advanced courses. What was taught at the main flying schools had become, by the fall of 1917, more offensive-minded than in years prior, ensuring that the RFC/RAF training programme remained compatible with the war being fought. What had once formed the bulk of a pilot's daily in-class training (artillery observation) had all but vanished from the classrooms of the RAF after the RFC/RNAS merger. In fact, classes on artillery observation were removed from the training programme altogether.<sup>13</sup> Nonetheless, many of the elements once related to artillery training were still taught in depth: map reading, navigation, and wireless communication. However, by this point, these classes were meant to improve pilot skill in combat patrols and attack missions. For example, map reading and navigation were taught with combat patrols and ground attack missions in mind. Similarly, wireless communication was taught as a useful tool for air-to-air communication during engagements with the enemy, not as a form of communication between aircraft and artillery batteries.<sup>14</sup>

By 1918 the RFC/RAF had increased the time spent on teaching bombing and strafing. This bombing instruction actually formed a considerable portion of a pupil's weekly lectures; bombing lessons were third only to gunnery and buzzing

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<sup>12</sup> PRO Air 1/724/75, "Syllabus for Courses of Instructors in Rigging Engines and Aerial Navigation, Air Ministry, October 1, 1918."

<sup>13</sup> Ibid.

<sup>14</sup> PRO Air 1/T77/151, "Programme of Work for Wing Pool, May 14, 1918, Waddington."

lessons (Morse code on the wireless) lessons in a pilot's weekly in-class routine. A pilot's instruction in aircraft construction now included how to use bomb racks and bomb sights.<sup>15</sup> Additionally, pilots were given in-class instruction on proper in-air bombing techniques.<sup>16</sup>

The RFC/RAF also seemed to be paying more attention to the physical health of its pilots. As much time was spent on physical training as bombing and buzzing. Physical training in this period went beyond the usual drill experienced by earlier airmen. Those undergoing training in 1918 were expected to undergo various calisthenic and team-building exercises, which were thought to keep the pilots' minds and bodies active to encourage discipline amongst the pupils. Likewise, team games encouraged some level of cooperation and competition.<sup>17</sup> It would appear that the RAF was trying to resolve a few major issues related to poor pilot training. For instance, British trainees were notorious for their inability to pilot aircraft at high altitudes, and it was believed that these exercises would help in that regard. Additionally, morale and comradeship, as noted, had been suffering. What better way, the RFC thought, to encourage these attributes than a game of football or "jump the bag?"<sup>18</sup>

The RAF also continued to tackle the poor pupil-instructor relationship (and by extension the poor morale of its trainees) that had prevailed throughout the

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<sup>15</sup> Ibid.

<sup>16</sup> PRO Air 1/T77/151, "Programme of Work for Wing Pool. May 14, 1918." At this time pilots received seven lectures per week on gunnery, six on buzzing, five on bombing and physical education, four on photography, two on anti-gas measures, and one on map reading, compasses, air force law, and cameras each.

<sup>17</sup> PRO Air 1/724/75, "Royal Air Force, Trained Men's and Supplementary Physical Training and Games, 1918."

<sup>18</sup> Ibid. "Jump the bag" involved a heavy bag, often a medicine ball, tied to then end of a rope. It was then spun around at ankle-level and pupils were expected to jump it once it reached them.

schools for much of the war. The RFC/RAF placed more importance on the morale of its pilots than in earlier years – so much so that in the RFC Cadet Wing syllabus (one of the first documents that pupils would have read) the importance of morale is clearly stated: “success in war is mainly dependent on discipline and morale, which are largely the product of mutual confidence between officers and men.”<sup>19</sup> Drill remained an important part of a pilot’s daily routine, no matter what stage of training he was in. Additionally, instructors were retained at their flying schools for longer periods of time.<sup>20</sup> It was believed that longer stays at training centres would allow instructors greatly to improve their skills as teachers and, more importantly, ensure that they had a more vested interest in the success of their pupils. More rigidly, the RAF outlined clear parameters regarding pupil-to-instructor and instructor-to-training-squadron ratios.<sup>21</sup>

However, the “sharp division” between pupil and instructor did not seem to disappear.<sup>22</sup> Squadron Leader J. L. Vawell was trained in 1916 and recalled in early 1918 to serve as a flying instructor. In his memoirs he describes a situation at his flying school almost identical to those discussed earlier: many pupils and instructors ate in different rooms, and when they did eat in the same mess hall they sat at different tables. Vawell lamented this situation, stating that pupils had “no opportunity to listen to shop talk” and could have “learned a great deal” had the

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<sup>19</sup> PRO Air 1/130/15/49/208, “Syllabus for First Two Months of Training in the RFC Officer Cadet wing,” 1916.

<sup>20</sup> PRO Air 1/678/21/13/2084, “Summary Notes on Training, 1918.”

<sup>21</sup> PRO Air 1/678/21/13/2084, “Summary Notes on Training, 1918.” Unfortunately, the document in question did not provide the specific ratios that were to be followed.

<sup>22</sup> PRO Air 1/2389/278/11/108, “The Service Experiences of Squadron Leader J. L. Vawell, January 22, 1928, Andover.”



opportunity been afforded to them.<sup>23</sup> Flight Lieutenant W. M. Yool indicates in his memoirs that this situation was no different in Egypt: there was “no liaison between instructors and pupils out of flying hours.”<sup>24</sup> It also appears that when pupils and instructors did communicate with each other, their relationship did not improve very much. In his reminiscences, Second Lieutenant A. P. M. Sanders reports being “laughed at” by his flight instructors because of his poor flying ability.<sup>25</sup> Clearly, Victorian and Edwardian classroom practices were still prevalent in the classrooms of the RAF.

Like these others, Squadron Leader A. J. Williams noted that the relationship between pupil and instructor had improved little from the beginning of the war. Williams, however, points to a different problem, one which had also been noted earlier: instructors who were either overworked or inexperienced. Williams felt that teaching was as tiring as being at the front and that the RAF was pushing its flying instructors too hard. As a result, many were indifferent to the progress of their students and approached their instructional duties with bitterness.<sup>26</sup> Second Lieutenant T. F. W. Thompson noted a similar problem. He discusses a situation in which instructors were callous and overworked due to the labour-intensive nature of their work.<sup>27</sup>

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<sup>23</sup> Ibid.

<sup>24</sup> PRO Air 1/2389/278/11/133, “The Service Experiences of Flight Lieutenant W. M. Yool, May 13, 1923, Andover.”

<sup>25</sup> PRO Air 1/2389/278/11/105, “The Service Experiences of Second Lieutenant A. P. M. Sanders, 1916-1924, January 1928.”

<sup>26</sup> PRO Air 1/2389/278/11/107, “The Service Experiences of Squadron Leader A. J. Williams, January 22, 1928, Andover.”

<sup>27</sup> PRO Air 1/2389/228/11/66, “The Service Experiences of Second Lieutenant T. F. W. Thompson, September 30, 1925, Andover.” P. C. Maltby also points to overworked instructors as a possible source of the continued poor pupil-instructor relationship.

A fundamental question still needs to be answered: did the adaptation of Robert Smith-Barry's Gosport System improve the results of pilot training in Britain? The men who served in the RFC and RAF, especially those who experienced both training systems, certainly felt that it did. The Gosport system appears to have given pilots graduating from the RFC and RAF training schools something that pilots graduating in years prior had no, for the most part, had: confidence in their flying ability. Memoirs of this later period attest a noticed improvement in pilot training. Specifically, Flight Lieutenant E. M. Pollard stated that a pilot had "definitely reached a standard" after graduating under the new system. To further his point, Pollard adds that "the standard of flying improved enormously."<sup>28</sup>

Additional examples include Flight Lieutenants E. J. Kingston-McCloughery and G. Martyn, and Squadron Leader A. J. Williams. Kingston-McCloughery was trained under the old system, in which he received only three hours of solo time before being sent to the front but was considered a "good pilot" because he could "take off and land again." Despite this, he was sent overseas to serve with what described as "no real idea of flying."<sup>29</sup> After his first tour he was recalled to undergo training as an instructor at Gosport. It was at Gosport that Kingston-McCloughery felt he truly learned how to fly: "it was not until I had been through the instructor flying course at Gosport that I really became at home in the air."<sup>30</sup> Similarly, Martyn, who once wrote of his own poor skills as a pilot and flight instructor, was surprised by the extremely high quality of pupils being turned out by

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<sup>28</sup> PRO Air 1/2387/228/11/57, "The Service Experiences of Flight Lieutenant E. M. Pollard, September 22, 1924."

<sup>29</sup> PRO Air 1/2389/228/11/121, "The Service Experiences of Flight Lieutenant E. J. Kingston-McCloughery, 1916-1918, January 23, 1928, Andover."

<sup>30</sup> Ibid.

the Gosport system.<sup>31</sup> Williams, another pilot, felt that the British “learnt more about flying during 1918 than during the whole of the rest of the war, due primarily to the Gosport System.” He went on to say that the RAF owed a “debt of gratitude to Smith-Barry” for the improvement in pilot training.<sup>32</sup>

Still, British pilot training was not perfect. Reports from squadron leaders regarding poorly trained pilots continued to trickle in. For example, in March 1918, an RFC general in the field (name not stated) wrote to RFC headquarters plainly stating that poorly trained pilots were still causing “avoidable damage” to aircraft.<sup>33</sup> More tellingly, Trenchard himself reported that: “a certain number of scouts are being wrecked through pilots having insufficient knowledge.”<sup>34</sup> However, Trenchard made a point of noting that generally “pilots now appear to fly their machines well.”<sup>35</sup> This comment, only four months after the Gosport System started to be used across the RFC, stands in marked contrast to the letters Trenchard had been writing eighteen months previously.

Does, however, the pilots’ perception of the Gosport System match statistical data on casualties and pilot training during the period? In fact, training schools of the RFC/RAF saw a considerable drop in the number of wrecked aircraft and pilots who were killed during training. In the old Training Division, British trainees wrecked on average 9.75% of the aircraft flown on a given day. This number is

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<sup>31</sup> PRO Air 1/2389/278/11/107, “The Services Experiences of Flight Lieutenant G. Martyn, Andover.”

<sup>32</sup> PRO Air 1/2389/278/11/107, “The Service Experiences of Squadron Leader A. J. Williams, January 22, 1928, Andover.”

<sup>33</sup> PRO Air 1/1135/204/5/224, “Letter from Brigadier-General, Commander 3<sup>rd</sup> Brigade, RFC to: HQ, RFC, March 18, 1918.”

<sup>34</sup> PRO Air 1/1135/204/5/2224, “Letter from Hugh Trenchard, Commander of RFC in the Field to Director of Air Organization, the Strand, November 5, 1917.”

<sup>35</sup> Ibid.

actually quite alarming: ten crashes for every 100 training flights.<sup>36</sup> However, after Gosport, this number declined to 3.11%.<sup>37</sup> Fatalities at British training centres also dropped considerably following the implementation of the Gosport system. Before Smith-Barry's reforms, RFC training schools suffered one fatality for every 790 flight hours. This number fell to one in 1,340 hours after the widespread adoption of the Gosport System.<sup>38</sup> Moreover, average pilot solo-time before deployment remained slightly under twenty hours, meaning that it was not simply more time in the cockpit that was responsible for the improvement in aircraft and pilot losses<sup>39</sup>

As noted earlier, the scale and intensity of the war in the air increased dramatically. The RFC/RAF ballooned in size, from 4,635 airplanes in service in March 1917 to 16,433 in June 1918: a 354 per cent increase. Accompanying this dramatic increase in fleet size was a rise in the number of commissioned officers: 20,317 (RFC and RNAS) at the end of 1917 compared to 27,333 at the war's end – a 74 per cent increase.<sup>40</sup> RFC/RAF casualties rose as well, there were 5,390 in 1917, in contrast with 8,170 in 1918, or an increase of 65 per cent.<sup>41</sup> However, it should not be thought that the more offensive doctrine adopted by Britain, or British training methods, were causing casualties to increase. In fact, pilot casualties were actually rising at a rate slower than the expansion of the service.

A more detailed analysis of British aircraft losses on the continent between July 1917 and July 1918 indicates that pilot training was improving during the war.

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<sup>36</sup> As Tredrey notes, wastage was even higher at French schools: 12.5 per cent.

<sup>37</sup> Tredrey, *Pioneer Pilot*, 76.

<sup>38</sup> Kennett, *The First Air War*, 129.

<sup>39</sup> PRO Air 1/2387/228/11/62, "War and Personal Experiences of J. Blackford."

<sup>40</sup> Lewis, *Squadron Histories*, 197.

<sup>41</sup> The air arm suffered more casualties in 1918 than during the three previous years of the war combined.

The RFC lost twenty-three aircraft in July 1917 to pilot error, or 18 per cent of total casualties. In July 1918, the RAF lost seventy-three aircraft to pilot error, or 22 per cent of casualties. However, despite this slight increase, losses in 1918 occurred almost entirely during landings and tended to be non-fatal. In many cases, were not severe enough to destroy the aircraft.<sup>42</sup> Looking backwards, the aircraft losses in 1917 tell a different story. The majority of crashes were fatal and the result of grievous piloting errors. For example, six of the twenty-three airplanes lost were in some kind of turn (too low, too slow, or too steep, for example). Most of the remaining accidents were the result of stalls, dives and other mistakes that indicate the pilot had lost control of his aircraft; only three were the result of erroneous landings.<sup>43</sup> It would appear that one of the Gosport System's fundamental aspects (forcing the pilot to cope with dangerous situations) was working, as fewer pilots were losing their aircraft (and their lives) to flawed or dangerous manoeuvring.

Even more specifically, a survey of 283 Sopwith Camel pilots who entered the service in early 1918 is quite telling. Of these, forty-six were killed in action, sixty-five were wounded in action, eighty-nine went missing in action, sixty were sent home for further training and only twenty-three remained at the front.<sup>44</sup> These numbers indicate that approximately 20 per cent of Camel pilots had to be sent home for further training in the last year of the war. This was slightly better than the general trend, in which 27 per cent of all pilots were recalled for additional training.

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<sup>42</sup> Most pilots would agree that landing was, and remains, the most difficult segment of flight. This is especially true for First World War era aircraft, whose light weight and often under-powered engines made landing exceptionally tricky.

<sup>43</sup> PRO Air 1/822/204/5/32, "Aeroplane Casualties, July 1917 – France," and PRO Air 1/822/204/5/412, "HQ RAF, Casualty Reports, 1<sup>st</sup> to 30<sup>th</sup> July, 1918."

<sup>44</sup> PRO Air 1/204/4/301, "Casualties up to October 21, 1918." The attrition rate of Camel pilots in early 1918 was incredible; 195 of 283 were killed, wounded or missing in action

These statistics indicate that the arrival of dangerously unqualified pilots had ceased to be the endemic problem described by squadron commanders in 1915 and 1916. Additionally, those pilots sent home for supplementary training were recalled after an average of 4.2 months at the front, and only four were sent home after less than three months with their squadrons. With the exception of those sent home prematurely, it seems that these pilots were being sent home for a refresher course, assignment as an instructor, or on furlough – not because they were poorly trained.<sup>45</sup> By contrast, only a year before, in July 1917, pilots of single-seat fighters were expected to survive only 2.5 months of frontline service.<sup>46</sup>

Other factors must be considered, however, before it is possible to attribute this improvement in British losses to training changes. First, the American entry into the war in April 1917 provided considerable relief to both Britain and France. This relief, however, was not immediate. The United States' air arm, like much of the rest of the US military, was unprepared to go to war in 1917; it had less than a hundred qualified aviators and only 142 aircraft.<sup>47</sup> Additionally, the US, due to a number of different patent and industrial disputes, had no airplanes fit for combat in Europe. The situation was so bad that *Aviation and Aeronautical Engineer* stated in an April 1, 1917, edition that the US had made “every conceivable mistake” in preparing itself for an air war.<sup>48</sup>

However, the American government, military and industry reacted quickly to rectify this situation. Between procuring aircraft from other Allied powers and

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<sup>45</sup> Morrow, *The Great War in the Air*, 267.

<sup>46</sup> PRO Air 1/683/21/13/2234, “Estimated Life of Pilots and Observers, RFC Document, July 1, 1917.”

<sup>47</sup> *Ibid.*, 268.

<sup>48</sup> *Ibid.*, 266.

rapidly developing an aviation industry of its own, the US was able to put into action forty-five squadrons with 2,034 airmen – 1,281 of whom became casualties.<sup>49</sup> Additionally, the US Army Air Service played a major role in the late battles of the war, especially at Saint-Mihiel (September 1918), where it formed more than half of the air force deployed against Germany. American assistance undoubtedly helped prevent a number of RFC casualties; the exact number is incalculable.

Shifting attention to the other side, Germany was able to maintain its technological lead over the Allies until the conclusion of the war. Nonetheless, the resulting benefits were greatly offset by the serious manpower and materiel deficiencies suffered by the German Air Service men and materiel in late 1917 and 1918. At the time of the Ludendorff Offensive (March 21, 1918), Germany had 3,668 aircraft, a substantial number, on the front line. However, had more than 4,500.<sup>50</sup> Even more importantly, Britain and France, as a result of their extensive training programmes and industry, were able to replace losses suffered at the front, which even into the summer of 1918 exceeded those of Germany. To the German command's dismay, Germany's pilot training programmes and industry were stretched to the limit and could not keep up with the mounting losses. Additionally, Germany also suffered severe gasoline shortages, a problem that limited flights considerably.<sup>51</sup> Therefore, Germany was lacking in machines and men, and what aircraft it was able to put forward were, while technologically superior, constantly running low on fuel. By the summer of 1918, supply and personnel problems had become so severe that the German Air Service could no longer provide an effective

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<sup>49</sup> Ibid., 337; and Kennett, *The First Air War*, 216.

<sup>50</sup> Morrow, *German Air Power in World War I*, 119.

<sup>51</sup> Morrow, *The Great War in the Air*, 300.

resistance to the Allied air forces, which, by now, had achieved decisive air superiority over the Western Front.

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Despite improvements, British pilot training wrestled with certain problems as the war came to a close. The RAF proved unable to resolve the poor pupil-instructor relationships found in the training schools. Squadron leaders were still complaining about the poor quality of graduating pilots. Britain's air arm still suffered higher casualty rates than those of Germany and France. Nonetheless, British pilot training improved considerably in the last year of the war, as a result of the Gosport System and changes to the curriculum. The actual number of lives saved by the Gosport System and the fluid training programme employed by the RFC/RAF is impossible to quantify. However, it can be fairly stated that the Gosport System indeed improved the RAF's contribution to the British war effort. The effect of pilot training on the result of the air war was not by itself definitive. Credit must also be given to other factors, such as Allied numerical superiority and Germany's logistical struggles late in the war. Nonetheless, how Britain trained its pilots had an impact on the allied air war as a whole. The detailed examination provided by this thesis will, it is hoped, shed some light on the larger question of why the allies proved victorious in the conflict.



## Conclusion

By the end of the war, the RFC had more than 30,000 officers and over 17,000 aircraft in service and had trained more than 22,000 pilots. More than 15,000 British pilots had become casualties of war – more than in Germany, and more than double France’s losses.<sup>1</sup> Despite these losses and the RFC’s struggles throughout the war, historians have argued that the air was one front on which the Allies could lay claim to having been victorious. They had achieved part of what Churchill had prophesized would be necessary: “command and perfection in aerial warfare.”<sup>2</sup> They certainly achieved control of the sky; nonetheless, it would be inaccurate to claim that the Allied effort in the air was anything resembling perfection. Great Britain started the war numerically and technologically inferior to its contemporaries. By the cessation of hostilities, it still trailed with respect to technology, and it had fought the war with an overly aggressive doctrine that often resulted high casualties, many of which were avoidable.<sup>3</sup> As much as has been written about it, the consequences of Britain’s conduct of the first air war are still open for debate among historians.

After the war, the RAF, like most of the British military, was cut down to a shell of its wartime self. Pilot numbers fell from approximately 30,000 to around

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<sup>1</sup> Morrow, *The Great War in the Air*, 367.

<sup>2</sup> Churchill, *His Speeches*, 2184; and Cooper, “The Development of Air Policy and Doctrine,” 48.

<sup>3</sup> Morrow, *The Great War in the Air*, 317-318.

6,000, only eleven months later.<sup>4</sup> Still, the RAF, remained active in the years after the war. It kept 400 officers and nearly 300 aircraft in southern Russia to aid the anti-Bolshevik White forces in that country's civil war. The RAF also saw action throughout the British Empire. The government, on the urging of Churchill and Trenchard, adopted a policy known as "air control," designed to use the RAF to enforce imperial authority. Consequently, the RAF was deployed in Ireland (for purposes of crowd control), the Middle East, India and Africa in the years immediately following the First World War.<sup>5</sup> As for the pilots who were discharged, many walked from aviation never to fly again. Others remained pilots and used their skills for the public's entertainment by giving rides or offering aerial aerobatic spectacles, not unlike before the war. Acrobatic pilots were not the only ones who remained in the air after the Great War. As part of a general postwar increase in international travel and tourism, many military pilots went on to civilian employment with one of Britain's new commercial airlines, such as Imperial Airways (the forerunner of British Airways).

The majority of the forty-four flying schools in Britain were shut down after the war, only to be used again as training centres and airbases after the outbreak of the hostilities in 1939. The Central Flying School, along with a number of other satellites, was kept in service as training centres for British pilots; it is still used to this day to train British flight instructors. After the Great War, the RAF abandoned the all-through system of instruction used in late 1917 and 1918 and returned to a system similar to that which had been used in the early years of the war, with

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<sup>4</sup> Ibid., 358.

<sup>5</sup> Ibid., 359.

students receiving their different stages of instruction at different locations. With wartime urgency no longer an issue, the RAF had the luxury of allowing each pupil to spend nearly 150 hours flying – as opposed to an average of twenty during the war – before earning his wings. Significantly, the RAF continued to use Smith-Barry’s in-flight method of instruction regardless of how advanced new airplanes became.

Robert Smith-Barry left the RAF in February 1919. He spent most of the 1920s living like a country gentleman, throwing parties and collecting money from his substantial cotton investment. He returned to flying in 1931, when he purchased his own aircraft, which he used to fly passenger and cargo flights in order to occupy by his time and earn an extra income. He returned to the RAF in early 1939 and spent the early years of the war acting as a ferry pilot. He was then transferred to India, where he acted as the instructional head at the No. 15 training unit until he resigned his commission in June 1943. Smith-Barry died in May 1949 due to complications from surgery on his injured legs. His training methods did nothing less than revolutionize pilot training in the English-speaking world. The training regimen developed at Gosport in 1917 was applied twenty-five years later throughout Canada, with the British Commonwealth Air Training Plan, and in other British dominions. The dual-control aircraft and the pupil-first philosophy remain bedrock principles of both civilian and military pilot training to this day. In spite of his rocky relationship with Smith-Barry, Hugh Trenchard called him “the man who taught the air forces of the world how to fly.”<sup>6</sup>

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<sup>6</sup> Tredrey, *Pioneer Pilot*, 113.

In certain respects, the British flight schools of World War I can be seen as a microcosmic arena in which larger societal issues played themselves out. The effort of pilots and instructors to engage in the era's most radically new technology mirrors the way the Great War forced Western society to confront, as never before, the vast changes brought about by the machines and inventions of the mature industrial age. Likewise, interpersonal relationships within British flight schools appear to stem from the same forces that many historians have argued were strengthening class divisions during and after, the First World War.<sup>7</sup> No image better signified these widening gaps than that of a soldier standing in the trench watching as an airplane flies over head. As countless veterans noted in memoirs, diaries and letters, pilots were the source of envy among soldiers on the ground: they appeared to be a different class of warrior.<sup>8</sup> Conversely, trainee pilots behaved very much like the rising middle class of the postwar period. Instead of simply taking orders, pilots longed for more equality and interaction with their instructors, a dynamic not nearly as common in other branches of the service at the time. In a sense, a new technology helped usher in a new way of thinking about class and social interaction. At the same time, pilots (who were largely middle-class) represented better than many other groups the combination of unrest, freedom, dissatisfaction and hope that largely defined the postwar world.<sup>9</sup>

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<sup>7</sup> Workers' strikes, for example, increased dramatically as the war went on. See Marc Ferro, *The Great War* (London: Routledge, 1973), 199, and Martin Kitchen, *Europe Between the Wars* (Harlow, UK: 1988).

<sup>8</sup> For one example, see Captain J. C. Dunn, *The War the Infantry Knew* (London: Abacus, 1938), 330.

<sup>9</sup> Rene Albrecht-Carrié, *The Meaning of the First World War* (Englewood Cliffs, N. J.: Prentice-Hall, 1965), 122.

There is still considerable research to be conducted in this subject area. As with many large projects, much of the research gathered for this thesis did not actually make it into the final draft. Furthermore, the PRO and Imperial War Museum, along with various RAF museums, were not exhaustively examined. Further research could easily produce a larger and more comprehensive work on this subject such as a PhD dissertation or monograph. Furthermore, there is also room for a more extensive comparison between British, French and German pilot training, as many sources in both Germany and France remain unutilised. A more systematic comparison would not only provide more insight into French and German training, but would also strengthen one of the key arguments put forward by this thesis: namely, that British training was, in reality, quite similar to the training programmes of other combatant nations. Different approaches could prove to be quite valuable. This thesis was most concerned with examining the course of British pilot training and its relationship to the war effort. A study more focussed on gender and social issues could provide more illumination into the connection between Victorian and Edwardian notions of education, knowledge, manhood, and individuality. Such a study could also be expanded to deal with other branches of the British armed forces.

While there is still room for future research, it is hoped that this thesis has addressed the research questions on its agenda and that the reader has a better perception of how Great Britain trained its military pilots during the Great War and why it adopted the methods it did. It is also hoped that this thesis has cast more light on a topic that can teach us much about the First World War, British society and the relationship between the two.

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