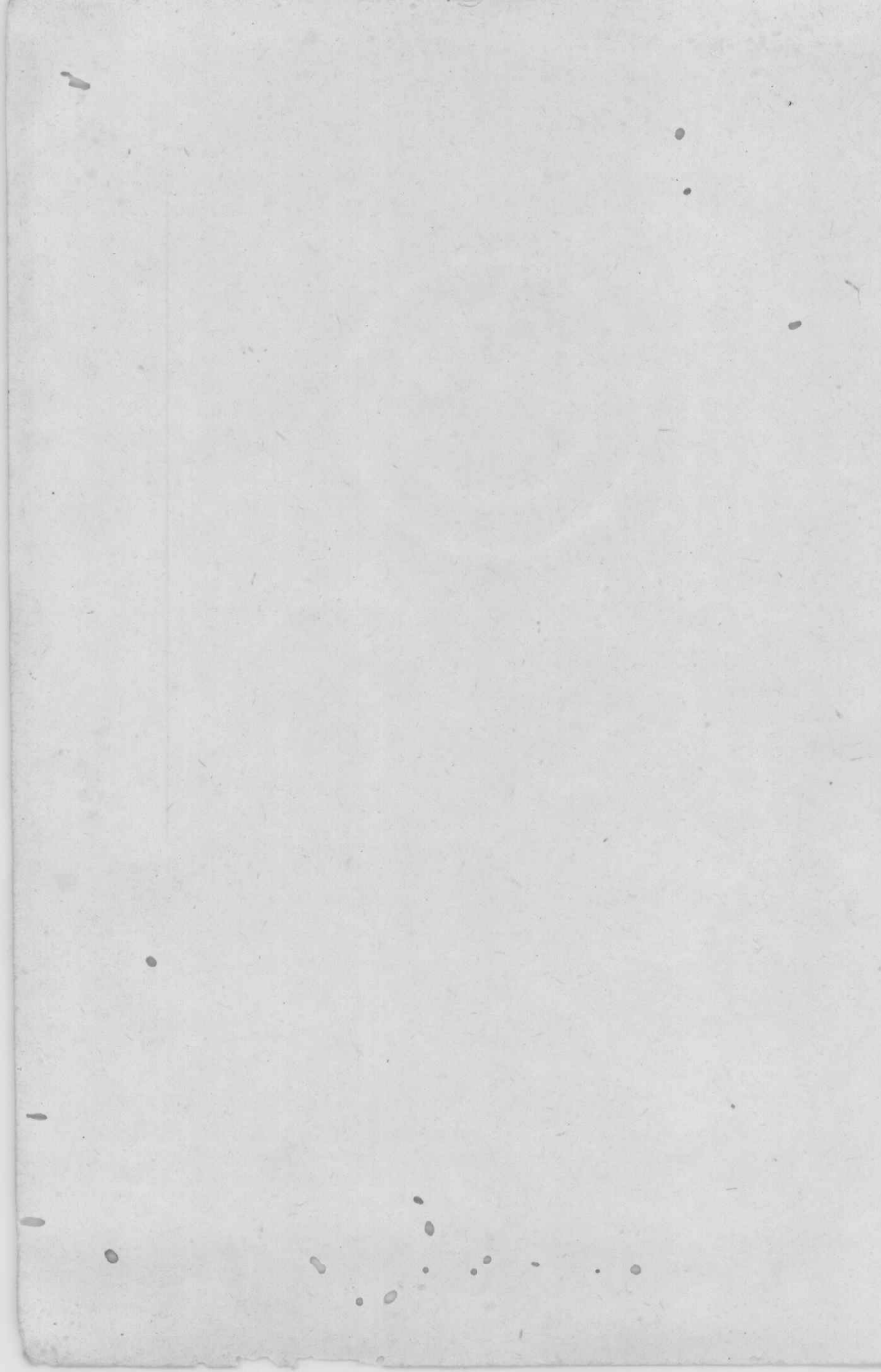


The **SKY'S** The  
**Limit**

**J. M. Spaight**

THE SKY'S THE LIMIT



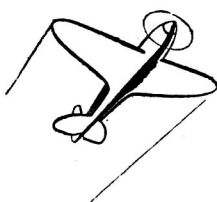
# THE SKY'S THE LIMIT

A STUDY OF BRITISH AIR POWER

BY

J. M. SPAIGHT,

C.B., C.B.E.



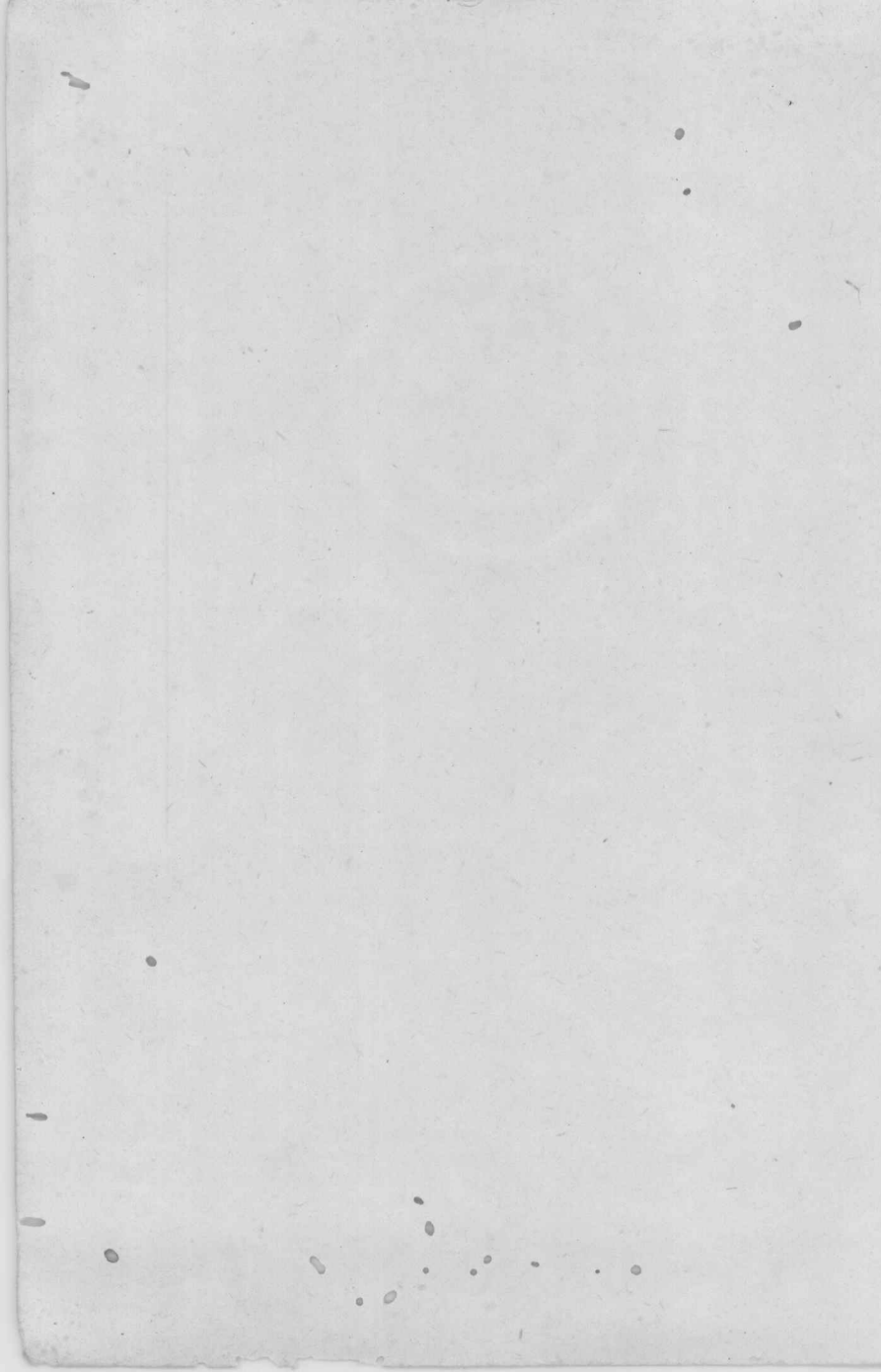
LONDON

HODDER AND STOUGHTON



*First Printed . . . . . August, 1940*

*Made and Printed in Great Britain for Hodder & Stoughton Limited, London  
by Wyman & Sons Limited, London, Reading and Fakenham*



# CONTENTS

CHAPTER	PAGE
1. BRITAIN RULED THE AIR - - - - The First Mastery—The Roll Call of Honour—Striking Power.	11
2. THE YEARS BETWEEN - - - - The Foundations Stood—The Power Returns—The "Shadow Factories"— Factories at War.	22
3. THE EMPIRE TAKES WINGS - - - - The Great Plan—Canada and Australia— Air Forces of the Dominions—U.S.A.	39
4. THE SPLENDID MACHINES - - - - "The Best in the World"—The Battle of Designs—The Bombers—The Fighters— Armour and Guns—Fighter <i>versus</i> Bomber.	55
5. THE MEN OF THE AIR - - - - Airmanship wins—R.A.F.—R.A.F.V.R.— A.A.F.—Airmen in the making.	74
6. BOMBERS AT WORK - - - - The Acid Test—Dive-bombing and "precision"—The Whitley rejuvenated —Security Patrol—The bombers get busy —The Bridge at Maastricht.	89



# CONTENTS

CHAPTER		PAGE
7.	FIGHTERS IN ACTION - - - - - Check to the Bomber—The Fighter Com- mand—Defending Britain's Coasts—St. George's Dragons—An Epic of Norway— Enter the Defiant.	105
8.	THE COASTAL COMMAND - - - - - Endless Vigil—Convoys and Flying Boats —The Fleet Air Arm—Air and Sea.	124
9.	AIR FORCE OVERSEAS - - - - - South and East—B.E.F.—Air and The Army—Lessons from Spain and France— Victory at Dunkirk.	134
10.	PAST AND FUTURE - - - - - The Bowmen began it—The power that Grows—The command of the air.	146
	INDEX - - - - -	157

## LIST OF ILLUSTRATIONS

	FACING PAGE
End of a Tanker - - -	<i>Frontispiece</i>
Sir Cyril Newall - - -	12
Sir Edgar Ludlow-Hewitt - - -	13
Dawn Patrol - - -	16
Anti-Aircraft Practice - - -	17
London's Anti-Aircraft Defences - - -	32
Anti-Aircraft Gun - - -	33
Hurricanes in the Making - - -	36
An Aircraft Factory - - -	37
Fairey Battles under Construction - - -	44
H.M. the King with a "Readiness" Squadron - - -	45
New Zealand Airmen - - -	45
Handley Page Hampden - - -	48
Bombing Up - - -	49
Australian Airmen - - -	52
Bristol Beaufort Bomber - - -	53
Spitfires - - -	60
Vickers Wellesley Bomber - - -	61
A Vickers Wellington Bomber - - -	64
Bristol Blenheim in Flight - - -	65
The Flying Classroom - - -	68
Aircraftmen in Training - - -	69
Apprentices under Instruction - - -	69
Operations - - -	76
The Link Trainer - - -	76
Miles Master - - -	77
The Harvard - - -	77

# LIST OF ILLUSTRATIONS

	FACING PAGE
R.A.F. Fighter Aircraft on the Western Front	80
Airspeed Oxford	80
The Photograph Speaks	81
Whitley Bomber	96
The Sting in the Tail	97
Sharp Shooters of the Air	100
Ground Defences	100
Target Practice	101
The New Fleet "Spotter"	101
Defiants on the Wing	108
The Defiant's Turret	109
Waiting for the Word	109
Wreckage of a Messerschmitt	116
Blackburn Skuas	117
The Fleet Air Arm's New Fighter	124
Convoy and Patrol	125
Short Sunderland	125
Saro-Lerwick	128
Short Sunderland	128
Torpedo Bombers	129
Torpedo	132
End of a Dornier	133
Avro Ansons	140
On the Western Front	141
H.M.S. <i>Ark Royal</i>	144
With the Fleet Air Arm	144
Food from the Air	145
A Fleeting Dornier	145
Rheine, Westphalia	150
A German Aerodrome	151
Hudsons over Heligoland	154
End of a Heinkel	154
The End of a German Bomber	155

## CHAPTER I

# BRITAIN RULED THE AIR

### THE FIRST MASTERY

WE are witnessing in these days a great drama which is in the nature of a revival, a re-setting on a grander scale of an earlier spectacle. The last generation saw the creation of British air power. We are privileged to-day to assist in its re-creation. For the second time in our history we are seeking in the air above us the source of that national strength which, from the time of the seventh Henry onwards, we have found in the sea around us ; and to-day we have an Empire to aid us in the quest.

In 1918 Britain was the strongest Power in the air. That position was not won easily or quickly. We had a rough road to travel. In August, 1914, our air strength was less than that of France or of Germany. The four squadrons of the Royal Flying Corps which took the field in August, 1914, were a patchwork body. Two of them were equipped with British machines—B.E.2's. The others had to depend in whole or part upon French machines—Blériots and Henri Farman's. Moreover, not a single one of them all had a British engine. Every machine in our squadrons had a French engine installed in it, mainly the Gnome rotary of

80 horse power. The British aircraft industry was almost non-existent. It was wholly unable to meet even the modest needs of the tiny expeditionary force of the air which left these shores in the first month of the last war.

Steadily we built up a mighty structure of air strength. We owed much to France in the early days. Indeed, for a substantial part of the war we relied upon France for aero-engines and to a less extent for airframes also. Many thousands of French engines had to be obtained for installation in our machines during 1915 and 1916. Aircraft, too, were supplied in considerable quantities from the same source. The Nieuport fighters helped us out of a tight corner more than once. Our total purchases of foreign aircraft, however, amounted to only a little more than 3,000 machines in the four years of war, as compared with 17,000 engines purchased abroad. It was only in the last year or so of the war that we became wholly independent of France for aeronautical equipment. Seeing how we started in 1914, one can only feel amazement that we should have ended the war with the magnificently equipped air force which we then possessed, predominant in quality as well as in quantity. It was a wonderful effort, when all is said and done.

When the war began we had on charge in the Royal Flying Corps and Royal Naval Air Service 218 land aeroplanes, 52 seaplanes and 7 airships, but less than 100 of the aeroplanes were in a condition to take the air. There were 276 officers and 1,797 other ranks in the two Services. Our production of aircraft during the first twelve months of the war averaged 50 a month, that of engines 14 a month. At the end of

## BRITAIN RULED THE AIR

the war we compared as follows with France and Germany, the two powers nearest to us in air strength :

### I

Total number of aeroplanes on charge in November, 1918 :

Great Britain	..	22,171
France ..	..	15,342
Germany	..	14,731

### II

Number of pilots and observers in November, 1918 (approximate figures) :

Great Britain	..	20,100
France ..	..	16,000
Germany	..	11,000

### III

Production in 1918 :

		Aircraft		Engines
Great Britain	..	26,685	..	29,561
France ..	..	23,669	..	44,563
Germany	..	14,386	..	16,412

### IV

Total production, 1914-1918 :

		Aircraft		Engines
Great Britain	..	55,093	..	41,034
France ..	..	67,982	..	85,317
Germany	..	47,637	..	40,449

Tables III and IV above are particularly significant. They show clearly that our graph of production was rising and Germany's falling. Our output of aircraft in 1918 was nearly 50 per cent. of our total output during the four years of war. Germany's output in 1918 was only 30 per cent. of her total production. We must have out-distanced her completely in the air if the war had continued into 1919. We had won the battle of the workshops and that meant, in turn, winning the battle in the air. Behind our immense production and France's there stood, moreover, the rising output of the United States. In 1918 about 12,000 aircraft and 31,000 engines were manufactured in that country: an extraordinary achievement, for America, it must be remembered, started from scratch in April, 1917. She had practically no aircraft industry at the time when she became involved in the war. To-day the position is very different. America has an immense aircraft industry now, and her productive capacity is as fully at our call as it was in 1918. The first call upon it is, of course, for her own re-armament, but then that call was even more insistent in 1918. It is possible that the assistance which we can obtain from the United States, in the shape of aeronautical equipment and the materials for such equipment, will prove to be as vital a factor in this war as her actual intervention was in the last.

An American expert has calculated that the United States will be supplying Britain and France (and France's contracts have now been taken over by Britain) with over 5,000 machines in 1940, that that number could be increased to 8,000, approximately, if extra plant capacity were taken into use, and that by

the spring of 1941 the United States will be producing aircraft of fighting types for foreign delivery at the rate of nearly 1,000 a month.<sup>1</sup> Even at present, it was stated by an informed correspondent at Washington, the American aircraft industry is capable of producing 1,800 aeroplanes a month.<sup>2</sup> A far greater production than this was foreshadowed by Lord Beaverbrook, Minister for Aircraft Production, in a broadcast on 24th July, 1940, when he stated that a new American programme was being approved which would yield 3,000 machines a month to Britain. Mr. Morgenthau, the Secretary of the Treasury, stated that the United States would give every facility for the supply of 72,000 aircraft to Britain in the two years, 1941 and 1942. Yet the American industry will be merely, for us, an extra source of supply ; its output will be completely overshadowed by our own.

No country in the world was in possession of such a formidable air force as was Britain in the closing months of the last war. In quality of equipment we held an undoubted lead. There were fine machines, too, in the French and German air forces, for all that they, like ours of that time, were made of silver spruce and very different from the all-metal stressed-skin machines of to-day. They did their job ; they had engine failures, to-day hardly ever experienced ; they had no speed to speak of ; but they fought and bombed, and that was what mattered. The Spad, the Nieuport, the Fokker D VII, the Albatros, the Halberstadt were

<sup>1</sup> Major G. F. Eliot, in *Life*, quoted in *The Times*, 6th January, 1940.

<sup>2</sup> *The Times*, 10th January, 1940. President Roosevelt has expressed the view that the production of the United States should be increased to 50,000 aircraft *per annum*.



fighters of which France and Germany had good reason to be proud; yet we had machines of better performance still in the Snipe and the S.E.5A. In the bomber class, too, we had no reason to fear any comparison. The D.H.9A among light bombers, the Handley Page among heavy, were the best of their time. There was no finer co-operation machine than the Bristol Fighter (it was not a fighter, for all its name, in the strict sense). For ten years the "Brisfit" remained a standard machine in the Royal Air Force; over 3,000 of the type were produced. Our aero-engines, too, were unsurpassed. They were puny things compared with the 1,000 horse-power engines of to-day, but, again, they were good for their time. The Napier Lion of 450 horse power, which did good service in the Royal Air Force for many years, was only in production at the time of the armistice, but the Rolls-Royce engines of 250 and 275 horse power were in use, and the same constructors' bigger engine of 375 horse power was installed in the four-engined super-Handley Pages which were to have bombed Berlin if the war had continued. These were water-cooled engines; in the air-cooled class our Bentley Rotary engines of 230 horse power were equally pre-eminent.

From 1917 onwards, said Lord Weir, who had been Secretary of State for Air in 1918, "the performance of our aeroplanes was very undoubtedly in advance of that of the Germans, who were cramped by their non-elastic engine policy."<sup>1</sup> "In 1918 we were incomparably the best equipped of all nations in the

<sup>1</sup> Paper read at Newcastle on 10th July, 1919, quoted in *Flight*, 31st July, 1919.