

Productivity and the Air War

The British Aircraft Industry in WWI

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This dissertation will investigate the performance of the British aircraft industry during the First World War and, specifically, how it tackled both technical and cultural obstacles towards increasing productivity. It will further assess the degree to which the British government positively or negatively shaped the performance of industry operators and, lastly, whether operators within the industry successfully harnessed 'lessons-learned' for improved post-war productivity.

Altogether, the investigation's research questions can be summarised as follows:

How effective was the British aircraft industry in overcoming technical obstacles – such as drawing availability, or the demands of more sophisticated products – in its shift from peacetime product sets to wartime aircraft production demands?

Did the British aircraft industry successfully overcome cultural obstacles – such as the inclusion of women workers, or longstanding cultures of craftsmanship – towards meeting wartime aircraft production demands?

How significant were British Government agencies – such as the Aeronautical Inspection Department – in either aiding or hindering the British aircraft industry in meeting wartime aircraft production demands?

Did the wartime experiences of the British aircraft industry produce enduring and meaningful productivity improvements post-war?

It must be stressed that none of the above research questions are entirely independent of the other. For instance, **technical** obstacles to productivity often coincided with **cultural** obstacles, and their resolution in turn sometimes hinged on government support. An historian might take productivity growth across the industry for granted, noting that annual deliveries of new aircraft to the Royal Flying Corps (RFC), Royal Naval Air Service (RNAS) and, later, the Royal Air Force (RAF), ballooned from 84 aircraft in 1914 to 7,230 aircraft in 1918.⁸⁷ Unfortunately top-level delivery data is an imperfect

metric, offering little context for individual successes or shortcomings, or identifying the challenges which may have prevented even greater top-level delivery rates. Only through closer analysis can we fully understand the wartime productivity achieved by the industry.

Productivity in this context is defined as the degree to which the industry enhanced the **quantity** and **quality** in its delivered products, or, put another way, how industry worked to achieve both *the production of enough aircraft to do the job...* [and] *the striving for equipment which is competitively equal or superior to that of allies and enemies.*⁸⁸ While the significance of **quantitative** productivity is self-evident, a 1915 source noted that, *for a good aeroplane engine... reliability is unquestionably the fundamental requirement.*⁸⁹ This investigation will accordingly balance its discussion of both **quantitative** and **qualitative** productivity. A focus on the latter would stray too deeply into pure engineering, while a focus on the former would not serve this investigation properly, not least because the British government's stated requirements offer a poor metric. Wartime government demand for aircraft consistently – and sometimes knowingly – outstripping industry's capacity to supply. On 12 December 1916, for instance, the Army Council approved an *increase of nearly 100%* in RFC squadron strengths, despite the fact that *it was considered that such an output [by industry] was impossible... under the conditions... at that time.*⁹⁰ Underpinned by over-optimistic assumptions in anticipated deliveries,⁹¹ further RFC expansion was then approved on 2 July 1917,⁹² only for another programme to be generated on 18 August 1917, with an additional *increase of 14%... in the... aeroplane programme, and no less than 63% increase in the engine programme,*⁹³ followed by then-Air Minister Lord William Weir generating *yet another extended programme of 328 squadrons*⁹⁴ in early 1918. For the purposes of this investigation, the British aircraft industry is defined simply as such British companies engaged in the design, construction or sustainment of military aircraft. This broad definition reflects the explosive growth of market participation, rooted